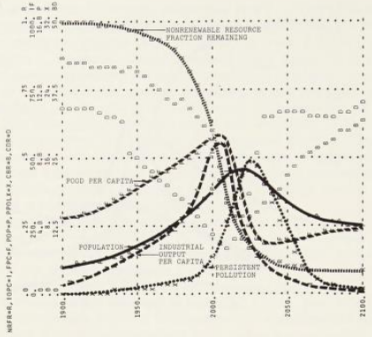

Figure 7-35 Run 7-25: increase of industrial and service capital lifetimes

Both the average lifetime of industrial capital ALIC and the lifetime of service capital ALSC are increased 50 percent in 1975, thereby extending the productivity of capital. When implemented without additional policies to reduce the capital investment rate, this policy proves to be counterproductive in the long run. Compared with the reference run, the extension of product lifetimes allows industrial output to grow more rapidly, leading to a quicker depletion of resources. The rise in resource costs forces industrial output per capita IOPC to decline earlier than in the reference run.

illustrates the effects of a 50 percent increase in both the amount of services and the amount of food desired by the population at each stage in industrial development. After 1975 the heavy emphasis on food and services causes industrial output per capita IOPC to stabilize near a level of 250 dollars per person-year (however, the size of the industrial capital stock is still rising at the same rate as the population). Any excess industrial output is allocated to increasing service capital or food production rather than to increasing the output of manufactured goods.

This value change alone is ineffective in avoiding a decline in food per capita FPC, population POP, and industrial output per capita IOPC. In the short run, the stabilization of IOPC reduces agricultural investments and thus land yields, forcing food per capita FPC to level off at 500 vegetable-equivalent kilograms per person-year in 1980 and to decline after 2020. In the long run, continued growth in population POP increases resource usage, which causes the fraction of capital allocated to obtaining resources FCAOR to rise after the year 2040. This rise again forces IOPC to decline after

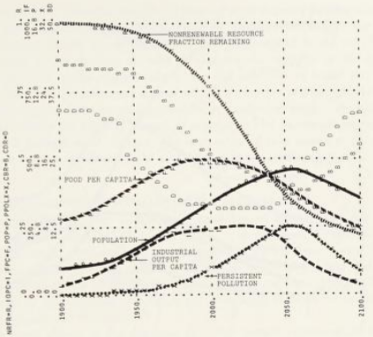

Figure 7-36 Run 7-26: shift in the choice of output forms

The amount of food and services desired by the population per unit of industrial output is increased by 50 percent in 1975. This shift in the choice of output slows the growth in industrial capital and industrial output, putting less pressure on the resource base. In the long run, however, the continually rising population POP thwarts the effectiveness of this policy, forcing a decline in industrial output per capita IOPC due to resource depletion.

the year 2040. The effectiveness of the shift in the choice of outputs seems to be thwarted in the long run by the continually rising population POP. The next run shows the behavior of the model if both POP and IOPC are stabilized by changes in social values.

Population Policy and Shift of Output Choices Run 7-27 (Figure 7-37) tests the effects of social value changes that tend to reduce the growth in both population and industrial capital, the two major contributors to growth in World3. Population POP stabilizes at 5 billion in 2050 after the desired completed family size is set equal to 2 children in 1975. The growth in industrial capital and thus in industrial output per capita IOPC is reduced by a value shift that increases by 50 percent (as in the previous run) the amount of food and services desired by the population at each stage of industrial development.

In this run the overshoot and decline mode of behavior is still evident, but it is