LaRouche-Riemann model forecast:

Can the U.S. economy survive the depression?

by David Goldman

Whether the United States economy is physically capable of recovering from the depression now in its first stages, and, if so, under what conditions, is the question underlying all current debate over economic policy. That the economy's survival itself is a matter of open question is established beyond doubt in this three-part survey.

The survey includes the first publication of new indices for depreciation of the capital stock and related measures of productive potential; a set of computer simulations of possible economic scenarios on the LaRouche-Riemann model; an authoritative analysis of the economy as a physical system; and a report on the

extraordinary economic results of the past seven months.

What makes the present situation altogether sobering is not only the live danger that we may not, after all, pull through this one, but the fact that the administration (and the leading Republican policymakers) are entirely blind to this danger. *Executive Intelligence Review* has repeatedly emphasized that econometric models of the Wharton variety cannot distinguish between productive and counterproductive spending within a given blob of Gross National Product, and can reinforce the worst suicidal delusions among economic leaders.

By the time these delusions are upset by the harsh turn of economic events, in this case, it will be too late. Our Swiftian economists will have fallen off the Island of Laputa.

Therefore, the editors of *Executive Intelligence Review* consider the publication of these results a matter of profound national importance. We have, as the LaRouche-Riemann model results tell us, little time left.

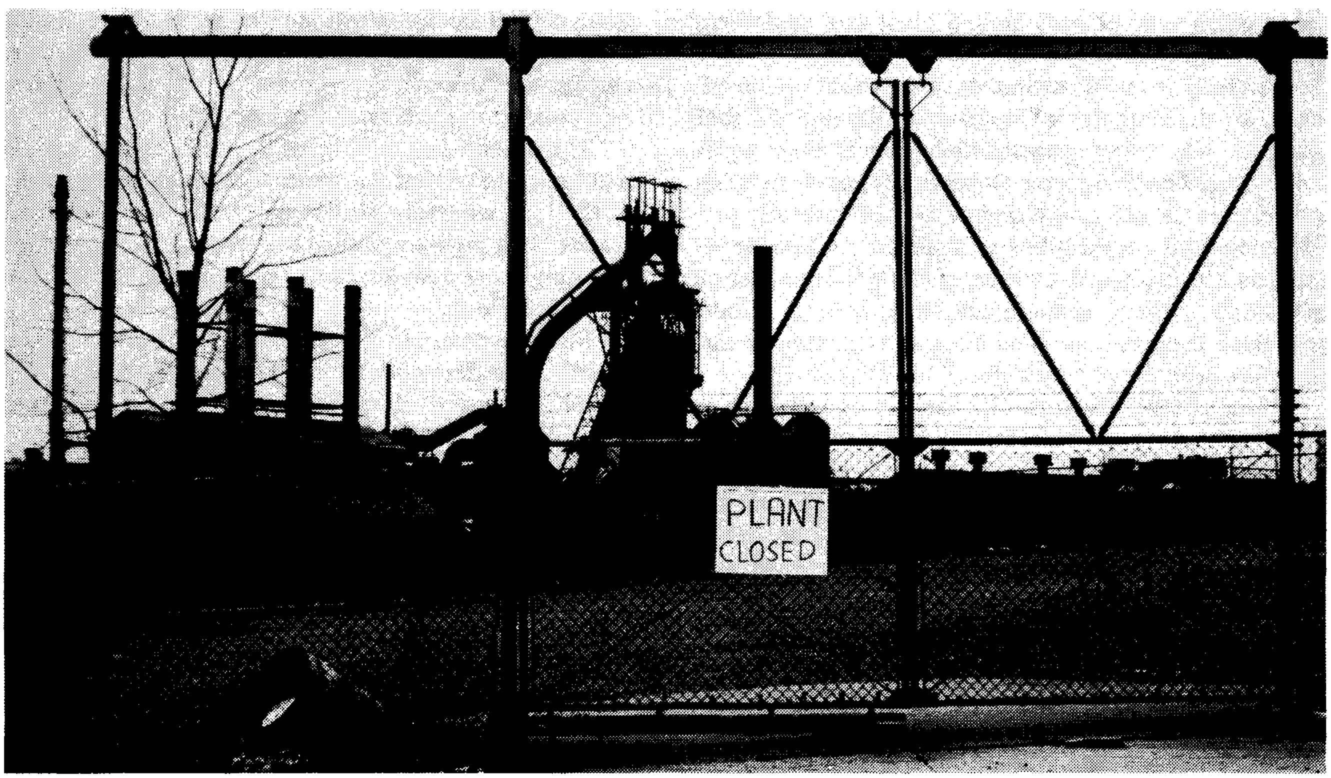
Thermodynamic death occurs in an industrial economy under the condition that society is *physically unable* to replace the capital goods and labor power it "consumes" in production. Below we present estimates for the real depreciation of the nation's capital stock (via deterioration, obsolescence, and reductions in scale). *EIR* will publish shortly a similar analysis of the productive labor force.

For the moment, it is important to note that only one

In this section

Our Special Report this week was prepared under the direction of Contributing Editor Uwe Parpart. Economics Editor David Goldman presents three scenarios of future economic performance to pose the question: "Can the U.S. economy survive?" Leif Johnson of *EIR* compares the recession of 1974-1975 and today, the industrial sectors most affected, and concludes that the much-touted 1980 recession will be unlike any other. Dr. Steven Bardwell, plasma physics research director of the Fusion Energy Foundation, and Dr. Uwe Parpart, discuss "the thermodynamics of the U.S. economy" and the fundamental refinements of the LaRouche-Riemann econometric model that have led to our conclusion that by 1981 the U.S. economy may very well have reached a point of no return. *EIR* researcher Alice Roth and FEF researcher Dr. John Schoonover provided critical inputs of data and analysis.

Photos: at left, David Goldman with Dr. Uwe Parpart at the computer. The industrial capacities needed for economic recovery will be lost if current administration policies continue for even six more months.



skilled machinist is now graduating from apprenticeship programs for every four positions opening for machinists annually. The same shortages are the norm among other categories of skilled operatives. Demographic "depreciation" is probably a cause of economic decline as bad or worse than capital stock depreciation. By proving the case for the latter, however, we prove our case for the economy as a whole.

Continuing in its current trajectory, the American economy will die thermodynamically late in 1981. Presently, failure to replenish our productive capital is not yet a question of absolute physical constraint, but still susceptible to policy changes to increase productivity and reduce unproductive overhead costs—just barely. The minimum survival conditions to prevent this, according to computer analysis, are

1) a minimum 3 percent annual growth in labor productivity (under a global, not an output-per-manhour definition)

and 2) a restriction of federally sponsored energy investments to only the most efficient forms of energy production, to nuclear fission, coal magnetohydrodynamics, thermonuclear fusion, and not to synthetic fuels, solar power, and so-called conservation programs.

Investment versus depreciation

Before proceeding to the computer analysis itself, we establish the following important fact: the rate of real depreciation now exceeds annual plant and equipment investment.

Currently available estimates of depreciation are admitted by the Commerce Department, Bureau of Labor Statistics, and other agencies that prepare them to be inadequate. The Commerce Department merely publishes whatever the Internal Revenue Service currently permits industrial corporations to deduct from taxable income as a depreciation expense. The only organization to conduct surveys of manufacturers and other goods-producing corporations (including construction, transportation, utilities and agriculture) is McGraw-Hill.

However, the McGraw-Hill data is flawed both in sampling technique (their sampling base has changed erratically over the past five years) and methodology. For example, the McGraw-Hill survey asserts that the amount of plant and equipment considered obsolete in 1978 by companies sampled was $80 billion, a sharp drop from over $100 billion in 1976. Apart from deficiencies admitted by McGraw-Hill in the sample, this also reflects, especially in heavy-industry categories, scrapping of obsolete equipment that has not been replaced, resulting in either shortages or greater import dependency.

Figure 1 shows the Commerce Department's estimate of net capital stocks (adjusted for replacement cost at existing scale and in 1972 dollars). It is visually clear that the trend-line changes sharply upward between 1964 and 1969, and then breaks after 1970. The earlier period reflects the best years of the postwar economy, coinciding with the height of NASA spending and the most rapid rate of realization of new technologies in the aggregate economy. In "absolute" terms, i.e., comparing industry to the state of the art on a world scale, this high rate of investment was not adequate. McGraw-Hill found $69 billion of investment requirements to replace obsolete technologies in its 1969 sample.

However, the difference between the growth rate earlier established, projected in Figure 1 through the 1970s, tells us what existing economic potentials the United States failed to realize. Within the geometry of the 1970s American economy, it quantifies unmet investment needs. (For 1974 and 1976, the index constructed this way coincides with the McGraw-Hill obsolescence estimates, but is much larger for 1978, when the McGraw-Hill approach failed in the way noted earlier.)

Figure 2 provides additional justification for this depreciation index. The graph line showing output per unit of capital stock, constructed by the Bureau of Labor Statistics shows — astonishingly—that the productivity of capital stock has never recovered its 1965 high point.

The post-1965 fluctuations in the curve are entirely cyclical. They show improvement in capital productivity as capital is scrapped during recession years, and declines when capital stock utilization rises. Since we are dealing with capital stock of unchanged overall *quality*, we are correct to calculate the volume of unmet investment *requirements* in the fashion described.

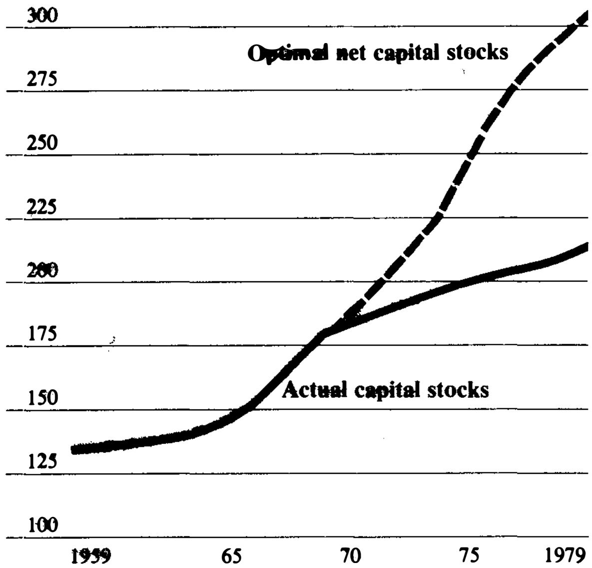
The second line of Figure 2, net capital stock per manhour, shows that the formerly rising capital intensity of the U.S. economy peaked in 1975 and has not since recovered, a highly significant corollary: the economy is churning more man-hours through the same deteriorating capital stock.

Figure 3 compares the Commerce Department's depreciation index with the *EIR* index and the rate of capital formation, showing that the real rate has been negative.

Figure 4 is a three-dimensional phase diagram showing, on three axes, output per manhour, energy consumption in BTU's per manhour, and investible surplus (see below) net of depreciation. A two-dimensional version of the same phase-diagram, showing only the first two variables, was published last month in *EIR*'s Special Report, "Energy conservation: building inflation into the economy." Dr. Steven Bardwell, in his accompanying discussion of the economy as a physical system, treats this issue in greater detail.

FIGURE 1
Manufacturers' net stock of plant and equipment

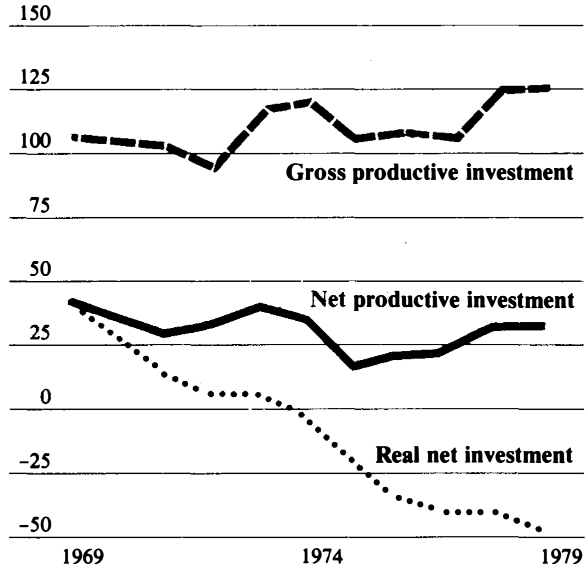
(billions of 1972 dollars)



Actual stocks are derived from Bureau of Economic Analysis estimates. Optimal net stocks are based on projecting the rate of growth from 1964-1969.

FIGURE 3
Productive fixed investment

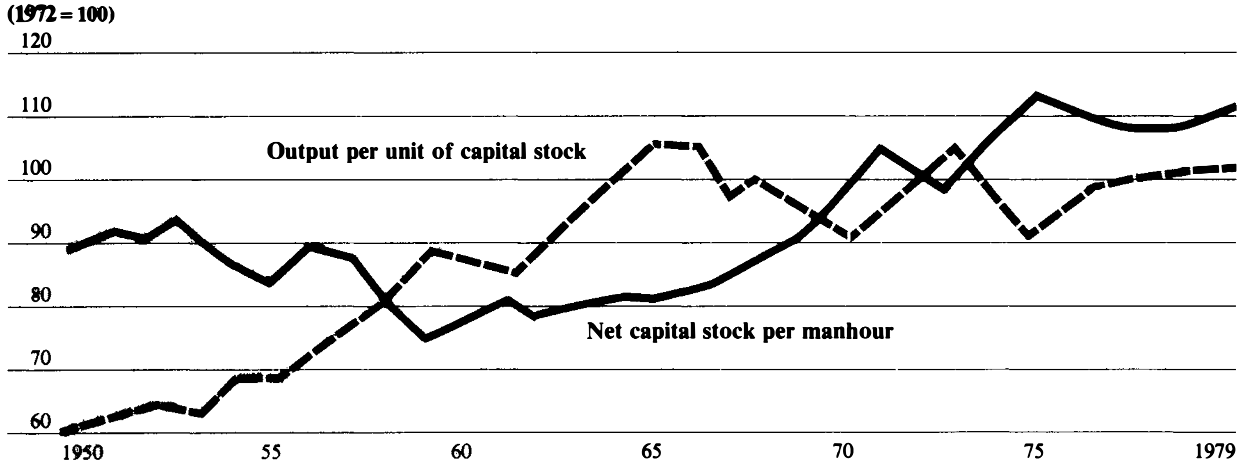
(billions of 1972 dollars)



The trend of gross investment is taken from the Bureau of Economic Analysis estimates adjusted for unproductive investment (like office buildings). Net investment is derived by adjusting for BEA capital consumption allowance. Real net investment is the gross adjusted by the *EIR*'s capital consumption allowance.

FIGURE 2
Capital intensity vs. productivity of capital

(1972 = 100)



The point, briefly, is that the energy and "productivity" parameters show after 1971 a decline in energy intensity combined with a modest rise in productivity. However, the addition of the third dimension—the vital index of reinvestible surplus (S')—shows that the "productivity" improvement occurs in a region of negative performance for the economy as a whole. This invalidates the argument that productivity growth is feasible on the basis of past performance in a regime of reduced energy intensivity.

Projecting current trends

The first set of computer-generated graphs adjoining (see pages 22 and 23) shows a simple projection of past trends in the real economy through 1985. The data employed were complete through 1979 and estimated for 1980, by extension of the first-quarter figures. We simulated the effects of continued secular decline in our global productivity ratio (surplus produced in tangible terms per increment of labor input (S/V), rather than "output per manhour") between 1975 and 1979. The results are entirely sobering.

The vital index of reinvestible surplus (S') (the amount of tangible goods available for capital formation and increase in the labor force after deducting overhead costs and depreciation costs) falls sharply into the negative during 1980, continuing a trajectory already empirically established in the 1979 data, and bottoming out at $139 billion (in 1972 dollars)—a staggering loss.

Only then does the level begin to recover, too late (in 1984) and from too low a level to sustain recovery. If that happens, the economy will never recover: it will never (short of foreign assistance) catch up with accumulating replacement costs. As Dr. Steven Bardwell shows in this report, the quotient of reinvestible goods has been in the region of zero since 1975. The LaRouche-Riemann computer simulation shows that the unpaid costs of economic deterioration will catch up with us by 1981.

The trend of total surplus (the equivalent of value added in tangible-goods terms, net of services) indicates that the absolute level of economic output will lag behind the earlier-mentioned index only by a year. The economy will go over a cliff during 1981.

Leif Johnson's accompanying discussion of the economy's current behavior is vital to understand in this context. Johnson reports that the stability of the industrial production index (despite the incredible decline of consumer-durables production) is entirely due to increased "overhead" spending for energy "conservation," pollution abatement devices, and similar counterproductive investments. Such investment at the expense of global economic productivity obviously cannot continue for long; the LaRouche-Riemann model concludes that it will continue for at most another year.

The index of reproductive potential (reinvestible surplus in relation to capital inputs plus labor inputs) drops from roughly zero during the late 1970s to -0.175 in 1982—again an historic low and below the level from which recovery is possible.

The same problem is indicated in another way: Total tangible output *plus* the replacement requirement built into the economy breaks sharply downward during 1981, the loss coming entirely out of current output (as the graph on total surplus shows), meaning that the economy moves far out of the range at which it can meet the replacement requirement.

In this projection, we are dealing with magnitudes of decline so large that the fundamental case is undeniable that America will not recover from this depression. The graph of total capital inputs net of depreciation, shows that this index, currently at zero, falls negative (note the wide scale) and fails to reach positive numbers by 1985.

However, under this simulation, the only possible condition for even this less-than survival level of net capital inputs is a decline in labor inputs, shown in the graph of Variable Capital (V), to less than the 1970 level. Strictly speaking, that is the format of a fascist economy. However, even under these conditions, *total output will collapse.*

The synfuel disaster

To reemphasize the point, this simulation merely projects the consequences of past mistakes, assuming that the Carter administration makes no further mistakes. Actual conditions promise to be much worse.

The administration currently proposes to build $280 billion worth of synthetic fuel plants during the next five years.* These will replace imported oil, not produce additional energy. Strictly speaking, they are an overhead cost to the economy. The graphs simulate economic conditions identical to the first group, but adding the cost of these synthetic fuel plants. In this case the decline is much more rapid. (see graphs on pages 22 and 23)

Reinvestible surplus absorbs virtually the entire decline, as it must, because this is the economy's fund for all new investments. It reaches the impossible negative figure of $297 billion. Total surplus (value added in tangible terms); also becomes *negative* by 1982. At this point the economy no longer meets circulating capital, let alone fixed capital costs.

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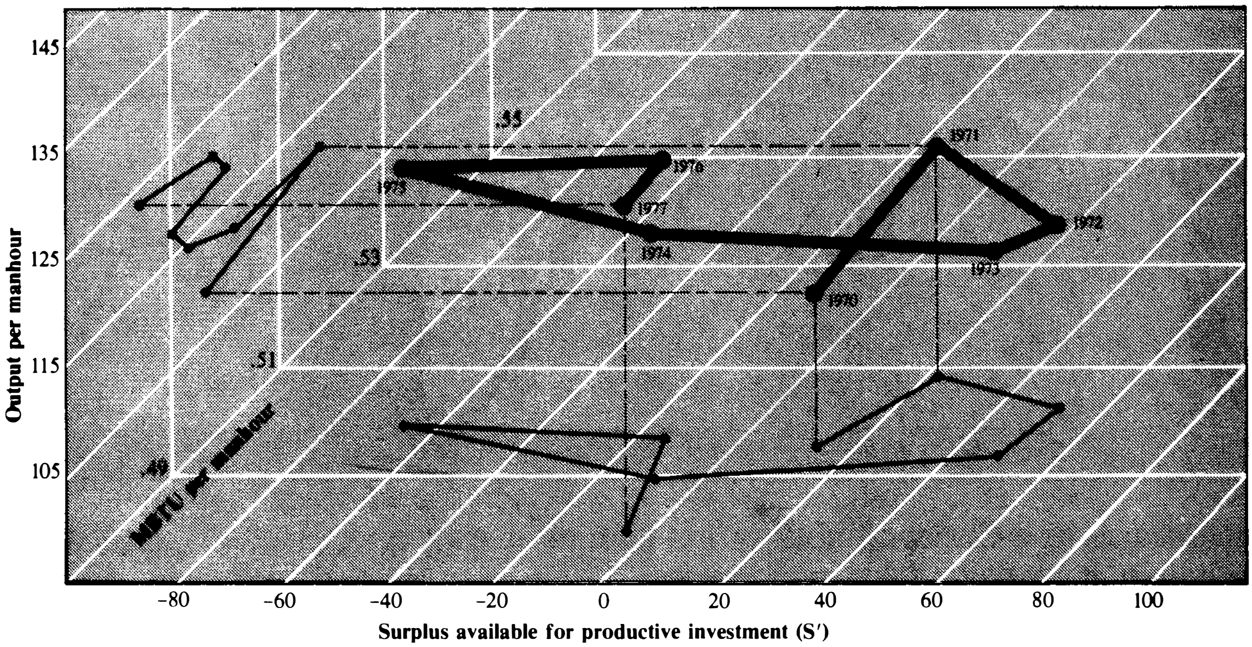
*Congress has pending at the moment a bill allocating $88 billion over 10 years for synthetic fuel development. The Carter administration has reserved the right to place this program under periodic review and funding increases. Policymakers like Felix Rohatyn of New York's Big MAC, an advocate of the ENCONO proposal for regional energy self-sufficiency, has recommended a funding level of hundreds of billions of dollars over the next decade. The $280 billion figure is a proposal being floated by the energy crisis managers at the Federal Emergency Management Agency

FIGURE 4
Spiraling collapse of the economy



As the concluding graphs of the series demonstrate, there is only one circumstance under which this economic program could be carried out, namely, if labor inputs (variable capital) are reduced to zero, i.e. if labor is entirely unpaid.

Adolf Hitler and Albert Speer demonstrated conclusively, on the Auschwitz-Buchenwald model, that this type of policy could be carried out, but also demonstrated that it could only be done with labor paid on straw soup. Again, the timing of the economic phase change is during 1981.

The minimum requirements for survival

The final set of graphs indicates the minimum survival conditions for the American economy. Against the first scenario, we projected (starting in 1980) a 3 percent per annum improvement in our productivity measure above the long-term baseline established in the past decade. The graphs (see pages 22 and 23) show an economic recovery in the medium term.

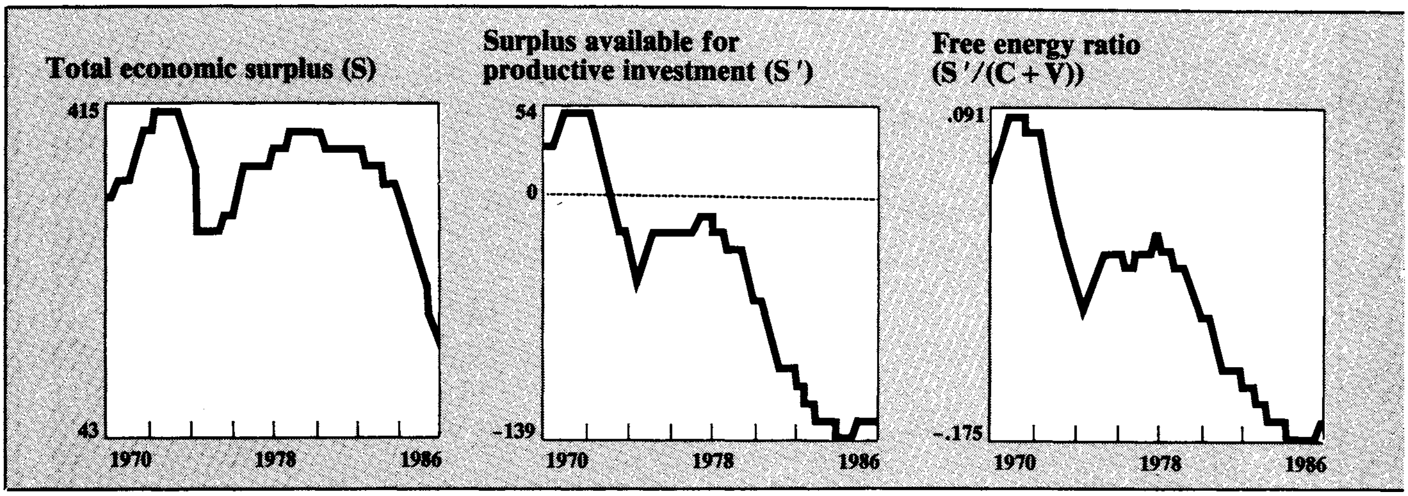
Three percent productivity growth is extremely difficult to achieve; it corresponds to the best periods of postwar American economic behavior, and those were prepared by earlier years of research and development and higher education of a new generation in the sciences. But we believe that it is still within the range of possibility. Another simulation incorporating a 2 percent per annum productivity increase showed that this level was insufficient to promote long-term economic recovery. The present set of computer results establish an *absolute minimum*.

In an important way, this projection is more distressing than the earlier projections showing how the economy might *not* survive. The critical parameters, including reinvestible surplus and the index of reproductive potential do not recover until 1984. Reinvestible surplus only rises above zero in that year, and reproductive potential does not recover its previous (low) peak until 1986. At this point only is it possible for the gross output parameters, total surplus, variable capital, net capital inputs, and total output, to rise from fairly low levels.

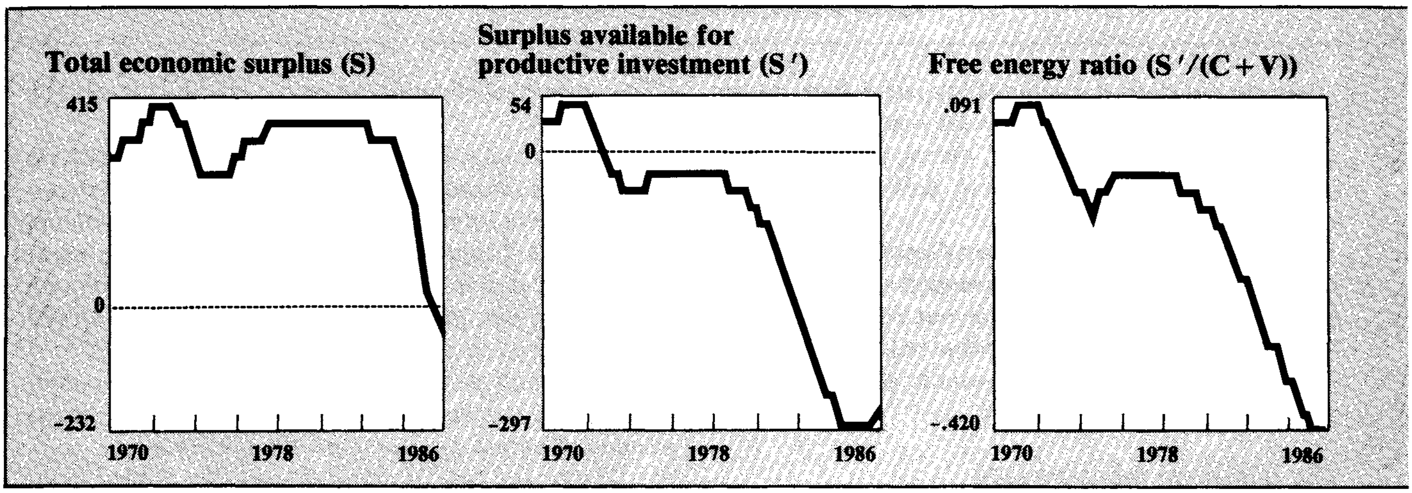
Under the best of circumstances, the United States faces a four-year period of consolidation. Employment of the most-efficient energy technologies, tax policies which offer strong incentives to goods-producing investment and strong penalties against services investment, university programs favoring the physical sciences and engineering rather than the liberal arts, upgraded training programs for skilled workers, monetary arrangements favoring long-term credit extensions and a gold-backed international monetary system would pull us through.

However, we have no more than a year left to take such measures on a crash basis. If we delay longer than that, or worsen the situation in the manner proposed by the Carter administration, the economy will undergo the "phase change" described rigorously in Dr. Bardwell's analysis. And this will constitute a point of no return for what was once the world's strongest industrial economy.

Projection of current trends in the U.S. economy through 1985

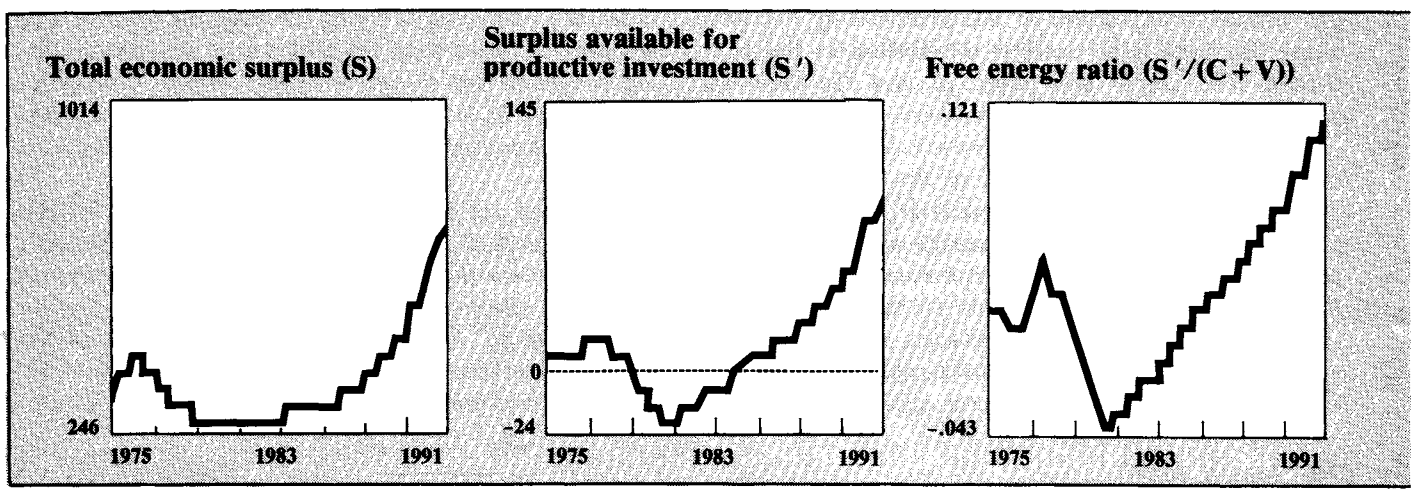


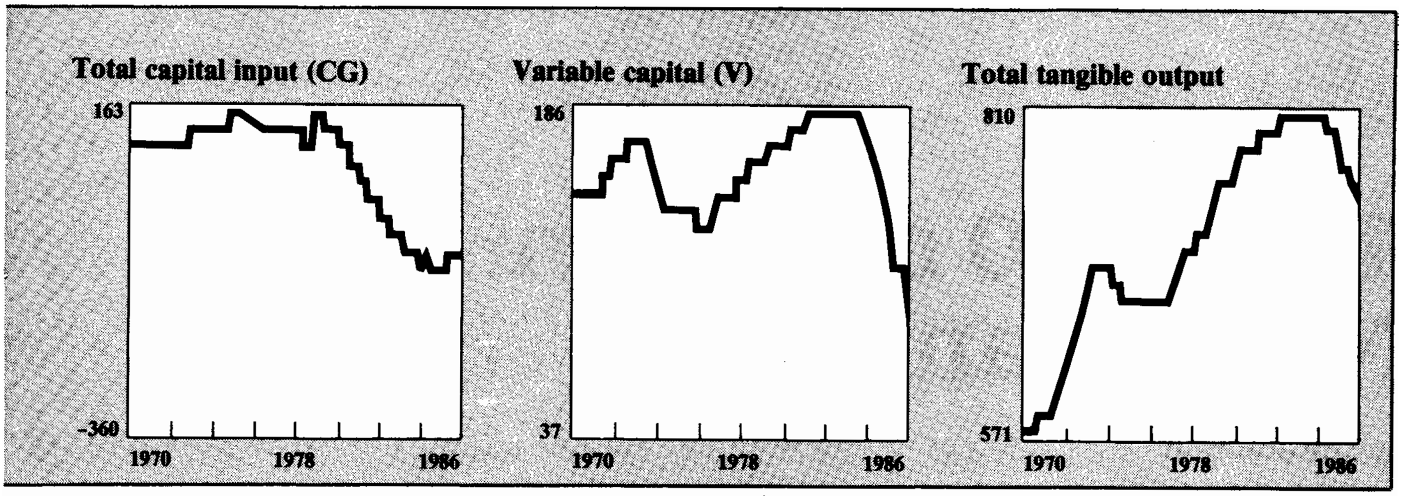
Consequences of a Carter administration plan to invest $280 billion in synthetic fuels over 5 years

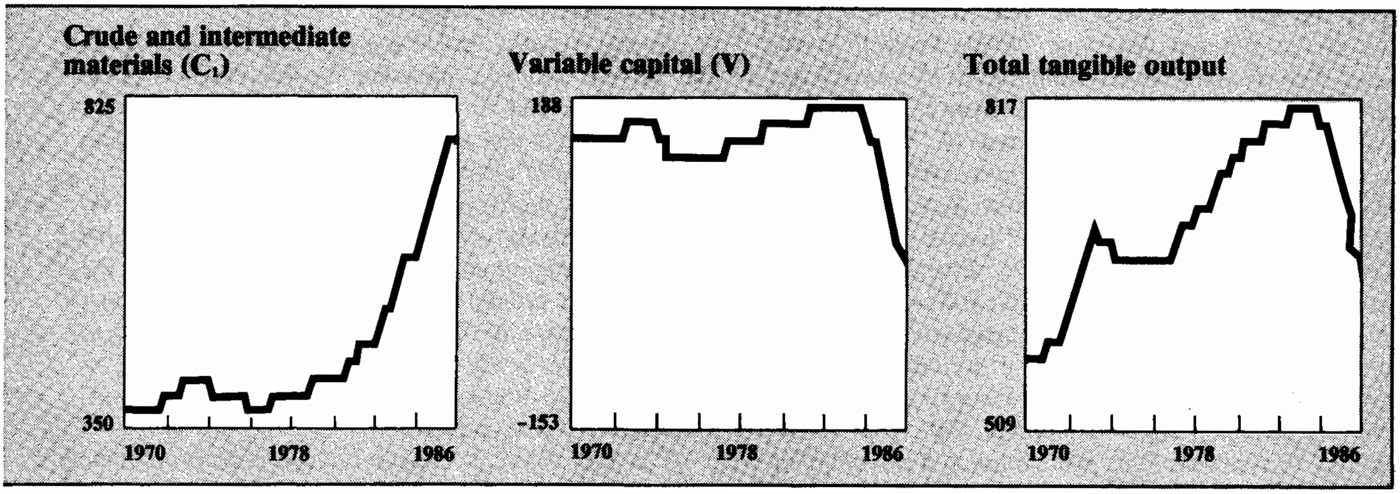


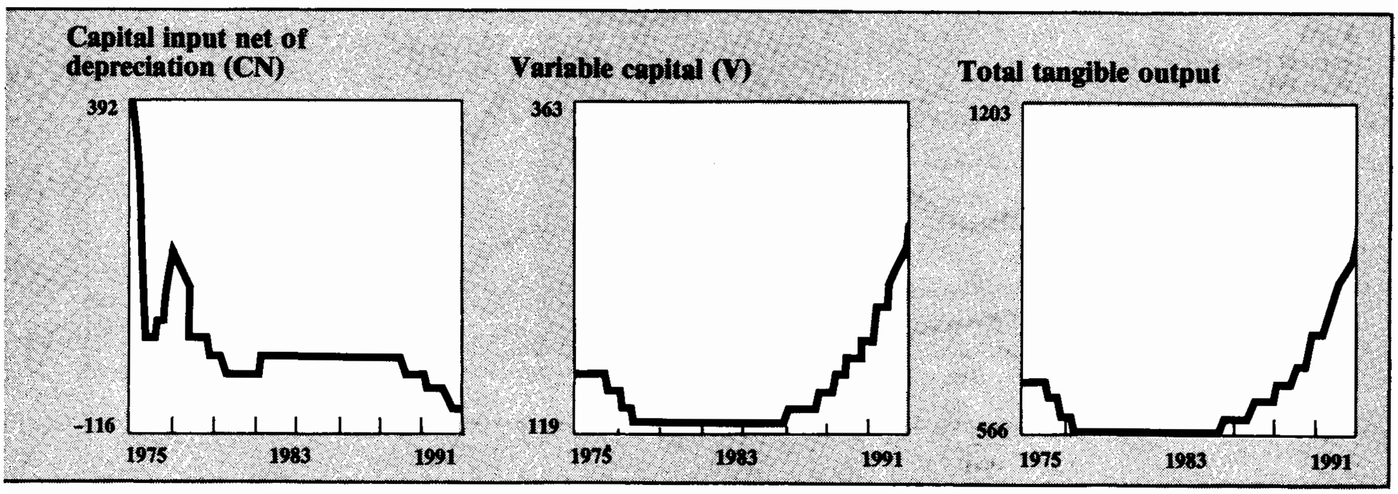
Minimum survival condition for U.S. economy

Projection of 3 percent productivity rise per year above base-line trend through 1990




Total capital input (CG)
163
-360
1970
1978
1986
Variable capital (V)
186
37
1970
1978
1986
Total tangible output
810
571
1970
1978
1986


Crude and intermediate materials (C_1)
825
350
1970
1978
1986
Variable capital (V)
188
-153
1970
1978
1986
Total tangible output
817
509
1970
1978
1986


Capital input net of depreciation (CN)
392
-116
1975
1983
1991
Variable capital (V)
363
119
1975
1983
1991
Total tangible output
1203
566
1975
1983
1991