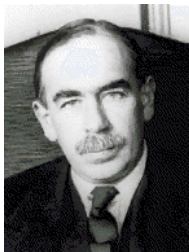


KEYNESIAN ECONOMICS AND THE LINEAR MODEL OF INNOVATION

PRELUDE

The other reports of this series studied the Linear model of innovation. The present report provides a brief overview of Keynesian economics, the dominant economic doctrine in the wake of the Second World War, and its relationships with the Linear model of innovation. In preparing this report, various books by John Kenneth Galbraith, a celebrated advocate of Keynesian economy, were widely used. Galbraith praised Keynes as “the most influential economist of this century” who “provides the case for looking at the ideas that interpret modern capitalism - or modern socialism - and which guide our actions in consequences¹”.



John Maynard Keynes
UPI/BETTMANN

John Maynard Keynes (1883-1946), born in Cambridge, England, was a civil servant in the India Office (1906-8), lecturer of Cambridge (1908-20), fellow of King (1909-46) member of the Royal Commission on Indian Finance and Currency (1913-14), Treasury official (1915-19), member of the Macmillan Committee on the Economic Advisory Council (1930-9), advisor to the Chancellor of the Exchequer (1940-6) and a director of the Bank of England from 1941 until his death in 1946².

“*The General Theory of Employment, Interest and Money*”, published in 1935, is Keynes’s most celebrated book. ‘General Theory’ has had such a profound impact on the trend of economic policies that Galbraith compares it with the Bible and *Das Kapital*. “General Theory is deeply ambiguous and, as in the case of the Bible and Marx, the ambiguity helped greatly to win converts. As also in the Bible and Marx, the reader can always find something he wants to believe³”.

In main stream economics, there rarely exists a direct reference to the role of innovation in Keynes’s doctrine. Innovation, it appears, did not play a major role in Keynesian economics. **This**

report argues that the Linear (R&D) model acted, of course tacitly, as the innovation base for Keynesian economics. There is reason to believe that the vast expansion in R&D that occurred during the Cold War period was connected in large measure with Keynesian economic policies, which generally aimed at preventing another Depression⁴.

BACKGROUND

During the Great Depression of the 1930s, it was found that the market, by itself, could not manage the economic chaos. Keynes was one of the firsts to advocate government spending as a means of stimulating the economy⁵ and creating employment opportunities.

To maintain the closest possible approach to full employment, Keynesian economic policy requires a steady flow of purchasing power - in economic terms, aggregate demand, which sets the limits on what the economy could produce. *The Good Society*⁶ by Galbraith covers a concise description of the process of stabilization of the flow of aggregate demand which is the vital factor in the Keynesian economy.

Aggregate demand has three decisive components: consumer expenditure, expenditure for private investment and expenditure from the fiscal operations of the state - from government spending that exceeds or falls short of tax receipts. If the flow of purchasing power - of aggregate demand - is insufficient to sustain a high level of economic activity and growth, it is commonly believed that certain readily available and greatly benign measures will restore consumer and business confidence. There are three substantive lines of corrective action that will increase the flow of aggregate demand as required.

First, taxes can be lowered, thus releasing to the consuming public more revenue to be expended on private consumption.

Second, interest rates can be reduced by central bank action, thus encouraging business and consumer borrowing and investment or expenditure, which add to the flow of aggregate demand.

Third, the government can contribute directly to the flow of demand by new expenditure in excess of tax receipts - by a deliberately accepted or deliberately increased deficit. By one or a combination of these steps aggregate demand can, or so it held or hoped, be kept at a level that will cause business and the government to reach out for all available workers.

There is, unfortunately, a wide difference in the effectiveness of these several public actions. There is also the problem of inflation. Action on interest rates, commonly referred to as monetary policy, has the highest establishment approval as an effective measure against stagnation and unemployment; it must, accordingly be the first for consideration.

The serious flaw in monetary policy is that it may have little or no effect on the flow of aggregate demand. When times are poor and unemployment is high, lower interest rates do not reliably inspire consumer expenditure; depressive attitudes, including those which are the product of unemployment or uncertain employment, are in control.

Tax reduction is also celebrated as a way to sustain aggregate demand during recession. Here again the hope is at odds with the reality; there is no certainty that the funds released by tax reduction will be invested or spent for the most good.

As a way to stimulate demand in times of negative growth or stagnation, there remains only direct and active intervention by the state to create employment. In an ideal world this last would not be necessary. In the real world of recurrent and prolonged stagnation there can be no effective alternative. To intervene, the government must borrow and accept the reality of a larger deficit in the public accounts. Improvements to the public infrastructure - roads, schools, airports, housing - that are effected by the work of those newly employed also add to public wealth and income. Public borrowing can, over time, be a fiscally conservative act. When the economy recovers and public revenues rise, there must then be the discipline that brings stimulative expenditure to an end.

In brief, Keynesian doctrine suggests that the government should, in times of serious unemployment, run deficits to support the flow of aggregate demand⁷ and a wise government could stabilize the economy close to full employment and avoid fluctuations and inflation. Later the numerous problems associated with such a program became apparent⁸.

Schumpeter argues that Keynes's model becomes mostly nearly justifiable in periods of depression when also liquidity preference comes nearest to being an operative factor in its own right⁹ In a Keynesian economic policy, as noted above, productivity - production per worker - was not a central issue. The educational levels of the work force, the supply and quality of capital plant, the role of technology and technological advance, had separate lives of their own. They are not the major subjects of concern¹⁰.

As was common in contemporary monetary economics, Keynes dichotomized the economy into its monetary and real sectors. The major breakthrough came in 1933 when, contrary to traditional theory, Keynes hit on the crucial role of changes in output and employment in equilibrium savings and investment, thus providing the basis for a more general theory than his own or his predecessor's previous work. The new theory seemed to offer the possibility of equilibrium at less than full employment, something missing in previous work. From his 1933 breakthrough, which hinged on the consumption-income relationship implicit in the multiplier, after considerable further work, everything fell into place. The problems of war finance and post-war planning appear to have been crucial in the spread of his ideas into day-to-day policy making¹¹.

Peter Drucker argues that Keynes, for all that he broke with classical economics, operated entirely within its framework. Keynes was a heretic rather than an infidel. Economics, for Keynes, was the equilibrium economics of Ricardo's 1810 theories, which dominated the nineteenth century. Ricardo's economics deals with a closed and static system. Keynes's key question was the same question the nineteenth-century economists had asked: "How can one maintain an economy in balance and static?"¹².

For Keynes, the main problems of economics are the relationship between the "real economy" of goods and services and the "symbol economy" of money and credit; the relationship between individual and businesses, and the "macro-economy" of the nation-states, and finally, whether production (that is supply), or consumption (that is, demand) provides the driving force of the

economy. In this case Keynes was in direct line with Ricardo, John Stuart Mills, and Alfred Marshall. However much they differed otherwise, most of these nineteenth-century economists had given the same answers to these questions: The “real economy” controls, and money is only the “veil of things”, the micro-economy of individuals and businesses determines, and government can, at best, correct minor discrepancies and, at worst, create dislocations; and supply controls, with demand a function of it¹³.

For the Keynesian system, the “symbol economy” of money and credit is “real”, and goods and services are dependent on it and its shadows. The macro-economy - the economy of the nation-state - is everything, with individuals and firms having neither power to influence, let alone to direct, the economy nor the ability to make effective decisions counter to the forces of the macro-economy. And economic phenomena, capital formation, productivity, and employment are functions of demand¹⁴.

WHERE TO GO FROM HERE

Although the Keynesian doctrine was initiated to remedy the Great Depression, its main application became wide spread after the Second World War. During most of the Cold War period (1945-1990), market oriented democracies feared two threats: a political/military invasion by the Soviet Union and another Depression.

By the late 1940s a factor was becoming strongly evident that would be economically important, even dominant, over nearly all of the next half century. That was the fear of Communism. At the Second World War's end, all of Eastern Europe fell under the influence or control of the Soviet Union. In the 1950s and 60s, there was the revival of the Soviet economy and the economic, scientific, engineering and military power it would sustain and seem to sustain. On October 4, 1957, Soviet scientists and engineers put the space satellite Sputnik into orbit. There would come continuing pressure for peacetime military expenditure. The arms buildup and space race were by-no-means-minor consequences of the Cold War. There was the greater fear of the military power of prowess of the Soviet Union¹⁵. Although there was no official link between the so-called devils of Depression and Communism, the main policies of this period looked for a set of simultaneous cures for both of them. Not surprisingly, the Cold war era was the period when both R&D and Keynesian doctrine flourished. The expenditure on R&D, directly by governments, or via government-supported programs, was perfectly matched with the inherent policies in Keynesian economics.

During the four and half decades of the Cold War, R&D became an undisputed national goal and a de facto technology part of Keynesian economics. However, Keynesian economists were so concerned with the supply of money and aggregate demand that they rarely appreciated or looked for an innovation base; and the R&D advocates were so busy with increasing the expenditure on R&D, that they scarcely found time to research the relationship between Keynesian economics and R&D development. Both disciplines took it for granted. Although Keynesian economics and R&D have had a long-standing relationship, they rarely appreciated the link between the two.

The beginning of the 1990s was dominated by the economic downfall of the Soviet Union. An imperfect economic system had come apart. At the demise of the Cold War, the Soviet Union

economically collapsed and politically disintegrated without an armed struggle. The great confrontation extending over the globe between Capitalism and Communism seems to be in the past¹⁶. The Cold war is over, however, it may take a while for the social, economic and technological institutions to harmonize themselves with the post-cold war era.

During the early decades of the Cold War, Keynesian economics sustained the free market countries and prevented their falling into another financial crisis as deep as the Depression of the 1930s. However, in the long run this economic approach conferred a huge burden on them. The following diagram¹⁷ demonstrates that since the early 1970s the US Federal Budget has always run on deficit, even during the boom years of Reagan and Bush. Obviously, the Keynesian doctrine was employed beyond its intention or scope. Galbraith argues that Reagan was the most clearly committed Keynesian since the Kennedy years, perhaps since Keynes himself.

| US Annual Budget Deficit, Billion US Dollars | | | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
| -2.8 | -23.0 | -23.4 | -14.9 | -6.1 | -53.2 | -73.7 | -53.7 | -59.2 | -40.2 | -73.8 | -79.0 |
| 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | |
| -128.0 | -207.8 | -185.4 | -212.3 | -221.2 | -149.8 | -155.2 | -153.5 | -220.5 | -268.7 | -399.7 | |

Destiny came to the Soviet Union, not because she was not active in social welfare or R&D; in fact the Soviet Union was the master in both of them. The free market countries are doing their homework to articulate a post-cold war structure, but they may need to hurry, time is passing by faster they are aware.

Galbraith argues that social and political conflict is not now, and in the future will not be, between capital and labor; it will be between the comfortably endowed and the relatively or specifically deprived. This may not, perhaps will not, be peaceful. Political voice and participation are the solvent of tension; when these are not available, violence becomes the alternative. The steps needed to relieve tension or resolve conflict are not in doubt. The economy must be so managed and, as necessary, supported so as to provide ample employment opportunity. This requires strong macro-economic actions¹⁸.

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