Alvin Hansen on Economic Progress and Declining Population Growth

The driving forces of economic growth, according to the mainstream of classical economic thinking, are threefold: technological innovations, the opening up of new territories and discovery of new resources, and increase in population. In interaction, in an entrepreneurial market economy, these forces generate growth not only in the aggregate but also per capita. Evidence of their power was seen in the long stretch of rising living standards in the West over the nineteenth century, despite the ups and downs of the business cycle. However, the economic experience of the interwar years, and in particular the Great Depression of the 1930s, suggested that the forces were largely spent and hence that future economic prospects were gravely imperiled. The Keynesian revolution in economics was a response to the evident malfunctioning of the capitalist economic system, although the policy recipes it offered (for increasing demand and investment to levels capable of generating an equilibrium consistent with full employment of productive resources, especially labor) by no means commanded unanimity.

The most prominent American contributor to and spokesman for the new line of economic analysis—often called "the American Keynes"—was Alvin H. Hansen (1887–1975), who took up his professorship of political economy at Harvard in 1937, just after the appearance of Keynes's General Theory. *In that post, which he held until his retirement in 1956, he was one of the most influential economists of the era as a theorist, policy adviser, and teacher. Hansen interpreted the economic problems of the 1930s not just as the manifestation of a particularly sharp cyclical downturn, but as evidence of secular stagnation caused by the closing of the economic frontier, sluggishness in technological innovation, and, not least, "a drastic decline in population growth." This "stagnation thesis" is most succinctly set out in his presidential address to the American Economic Association, delivered in Detroit, 28 December 1938, under*

the title Economic Progress and Declining Population Growth. *The address is reproduced below from the March 1939 issue of the* American Economic Review. *(The opening paragraphs of the address, and two paragraphs, immediately preceding the closing paragraph, in which Hansen discusses changes in US national income in the 1930s, have been omitted.)*

Hansen's analysis of the effects of declining population growth in many ways echoes the thesis set out by Keynes in his seminal Galton Lecture delivered to the Eugenics Society in 1937 (reprinted in the Archives section of PDR *4, no. 3): a demographic slowdown decreases opportunities for profitable investments and increases levels of attempted saving, hence pushes the economy toward a low-growth equilibrium at which resources are underutilized and unemployment is high. Hansen puts special emphasis on demographically induced shifts in the composition of output. He suggests that, beyond its direct positive effect on investment and output, population growth also has an indirect enhancing effect on these factors by facilitating technological progress—contrary to the "older Malthusian view." In his policy proposals Hansen was more interventionist than Keynes, advocating a more intrusive government role in the economy as a possible means of escaping the vicious cycle of low demand and high unemployment. As to government action to reverse demographic trends seen as deleterious, neither Keynes nor Hansen argued for policies to increase fertility, presumably because they saw them as both inappropriate and, in comparison to remedial economic policy measures, inefficient or unfeasible.*

The demands of the war economy in the years following Hansen's address took care of the employment problem, and the immediate postwar decades brought the stimuli of pent-up consumer demand, an outpouring of technological innovations, a reopening of the economic frontier produced by a more liberal trade regime, and, also, an acceleration of population growth. The result was rapid overall economic growth and increasing levels of per capita income. Keynesian demand management played some role in this economic success story: by the end of the 1960s even US President Richard Nixon pronounced himself a Keynesian. But it offered no remedy for the stagflation that eventually followed. The growth-promoting recipes favored in the last decades of the century (especially in the most successful developing economies) were anything but Keynesian: limited government, fiscal restraint, and globalization.

Yet recent and anticipated demographic trends, especially in Europe—notably fertility decline and population aging—make Hansen, once again, interesting reading. Commitments of the modern welfare state for health care, retirement pensions, and job security command wide approval, but they have boosted governments' weight in the economy and made labor markets inflexible, unemployment high, and retirement early—developments that may increasingly impose a brake on economic growth and on improvements of living standards. Reform measures to ease these burdens are, in principle, straightforward, but their immediate social costs are heavy and their rewards are delayed, hence resistance to reform is strong and growing. This is likely to stimulate the search for alternative policies that offer politically more palatable tradeoffs—some of which may turn out to have an unmistakably Hansenian

flavor. As to future population trends, Hansen, despite his reference to a "drastic decline in population growth" based on a comparison of nineteenth- and twentieth-century Western demographic change, envisaged a convergence to a stationary population or a tendency toward very slow decrease. Yet some economies are already locked into a demographic pattern that augurs sharper declines and more rapid population aging, enhancing the relevance of the issues posed by Hansen. In Germany, for example, in the absence of immigration, the population between ages 20 and 40 will decline from 21.6 million in 2005 to 16.3 million in 2025—a drop of 23 percent. Over the same time period, the population aged 60 and older will grow from 20.5 million to 25.8 million—an increase of 26 percent. Serious efforts to slow population decline and retard population aging by stimulating fertility would of course add another major burden to government budgets.

Schooled in the traditions of the Malthusian theory, economists, thinking in terms of static economics, have typically placed an optimistic interpretation upon the cessation of population growth. This indeed is also the interpretation suggested by the National Resources Committee which recently has issued an exhaustive statistical inquiry into current and prospective changes in population growth. In a fundamental sense this conclusion is, I think, thoroughly sound; for it can scarcely be questioned that a continued growth of population at the rate experienced in the nineteenth century would rapidly present insoluble problems. But it would be an unwarranted optimism to deny that there are implicit in the current drastic shift from rapid expansion to cessation of population growth, serious structural maladjustments which can be avoided or mitigated only if economic policies, appropriate to the changed situation, are applied. Indeed in this shift must be sought a basic cause of not a few of the developments in our changing economy.

Adam Smith regarded growth of population as at once a consequence and a cause of economic progress. Increasing division of labor would, he argued, bring about greater productivity, and this would furnish an enlarged revenue and stock, from which would flow an enlarged wages fund, an increased demand for labor, higher wages, and so economic conditions favorable for population growth. Now a growing population, by widening the market and by fostering inventiveness, in turn facilitated, he thought, division of labor and so the production of wealth. Thus he arrived at an optimistic conclusion. Population growth, he held, stimulated progress and this in turn stimulated further growth and expansion. In contrast, the pessimistic analyses of Malthus and Ricardo stressed the limitation of natural resources and the danger of an increasing population's pressing down the margin of cultivation to a point at which real income would be reduced to a bare subsistence level. In this static analysis the more dynamic approach of Adam Smith was quite forgotten. If we wish to get a clear insight into

the economic consequences of the current decline in population growth, it is necessary to return to the suggestion of Adam Smith and to explore more fully the causal interconnection between economic progress, capital formation and population growth.

Economic analysis from the earliest development of our science has been concerned with the rôle played by economic progress. Various writers have included under this caption different things; but for our purposes we may say that the constituent elements of economic progress are (a) inventions, (b) the discovery and development of new territory and new resources, and (c) the growth of population. Each of these in turn, severally and in combination, has opened investment outlets and caused a rapid growth of capital formation.

The earlier economists were concerned chiefly with the effect of economic progress upon the volume of output, or in other words, upon the level of real income. For them economic progress affected the economic life mainly, if not exclusively, in terms of rising productivity and higher real income per capita.

Not until the very end of the nineteenth century did an extensive literature arise which stressed the rôle of economic progress as a leading, if not the main, factor causing fluctuations in employment, output, and income. Ricardo had indeed seen that there was some relation between economic progress and economic instability; but it was left for Wicksell, Spiethoff, Schumpeter, Cassel, and Robertson to elaborate the thesis that economic fluctuations are essentially a function of economic progress.

More recently the rôle of economic progress in the maintenance of full employment of the productive resources has come under consideration. The earlier economists assumed that the economic system tended automatically to produce full employment of resources. Some unemployment there was periodically, owing to the fluctuations incident to the business cycle; but in the upswing phase of the cyclical movement the economy was believed to function in a manner tending to bring about full recovery—maximum output and employment. This view was inspired by a century in which the forces of economic progress were powerful and strong, in which investment outlets were numerous and alluring. Spiethoff saw clearly that technological progress, the development of new industries, the discovery of new resources, the opening of new territory were the basic causes of the boom, which in turn was the progenitor of depression. Indeed he believed that once the main resources of the globe had been discovered and exploited, once the whole world had been brought under the sway of the machine technique, the leading disturbing factors which underlie the fluctuations of the cycle would have spent their force and an era of relative economic stability would ensue. But he did not raise the question whether such stability would be achieved at a full-employment and full-income level.

The business cycle was *par excellence* the problem of the nineteenth century. But the main problem of our times, and particularly in the United States, is the problem of full employment. Yet paradoxical as it may seem, the nineteenth century was little concerned with, and understood but dimly, the character of the business cycle. Indeed, so long as the problem of full employment was not pressing, it was not necessary to worry unduly about the temporary unemployment incident to the swings of the cycle. Not until the problem of full employment of our productive resources from the long-run, secular standpoint was upon us, were we compelled to give serious consideration to those factors and forces in our economy which tend to make business recoveries weak and anaemic and which tend to prolong and deepen the course of depressions. This is the essence of secular stagnation—sick recoveries which die in their infancy and depressions which feed on themselves and leave a hard and seemingly immovable core of unemployment.

In every great crisis the struggle of contending groups maneuvering for an advantageous position amidst rapid change whips up the froth and fury of political and social controversy. Always there is present the temptation to explain the course of events in terms of the more superficial phenomena which are frequently manifestations rather than causes of change. It is the peculiar function of the economist however to look deeper into the underlying economic realities and to discover in these, if possible, the causes of the most obstinate problem of our time—the problem of underemployment. Fundamental to an understanding of this problem are the changes in the "external" forces, if I may so describe them, which underlie economic progress—changes in the character of technological innovations, in the availability of new territory, and in the growth of population.

The expanding economy of the last century called forth a prodigious growth of capital formation. So much was this the case, that this era in history has by common consent been called the capitalistic period. No one disputes the thesis that without this vast accumulation of capital we should never have witnessed the great rise in the standard of living achieved since the beginning of the Industrial Revolution. But it is not the effect of capital formation upon real income to which I wish especially to direct attention. What I wish to stress in this paper is rather the rôle played by the process of capital formation in securing at each point in this ascending income scale fairly full employment of the productive resources and therefore the maximum income possible under the then prevailing level of technological development. For it is an indisputable fact that the prevailing economic system has never been able to reach reasonably full employment or the attainment of its currently realizable real income without making large investment expenditures. The basis for this imperious economic necessity has been thoroughly explored in the last half century in the great literature beginning with Tougan-Baranowsky and Wicksell on saving and investment. I shall not attempt any summary

statement of this analysis. Nor is this necessary; for I take it that it is accepted by all schools of current economic thought that full employment and the maximum currently attainable income level cannot be reached in the modern free enterprise economy without a volume of investment expenditures adequate to fill the gap between consumption expenditures and that level of income which could be achieved were all the factors employed. In this somewhat truistic statement I hope I have succeeded in escaping a hornets' nest of economic controversy.

Thus we may postulate a consensus on the thesis that in the absence of a positive program designed to stimulate consumption, full employment of the productive resources is essentially a function of the vigor of investment activity. Less agreement can be claimed for the rôle played by the rate of interest on the volume of investment. Yet few there are who believe that in a period of investment stagnation an abundance of loanable funds at low rates of interest is alone adequate to produce a vigorous flow of real investment. I am increasingly impressed with the analysis made by Wicksell who stressed the prospective rate of profit on new investment as the active, dominant, and controlling factor, and who viewed the rate of interest as a passive factor, lagging behind the profit rate. This view is moreover in accord with competent business judgment.[1] It is true that it is necessary to look beyond the mere *cost* of interest charges to the indirect effect of the interest rate structure upon business expectations. Yet all in all, I venture to assert that the rôle of the rate of interest as a determinant of investment has occupied a place larger than it deserves in our thinking. If this be granted, we are forced to regard the factors which underlie economic progress as the dominant determinants of investment and employment.

A growth in real investment may take the form either of a deepening of capital or of a widening of capital, as Hawtrey has aptly put it. The deepening process means that more capital is used per unit of output, while the widening process means that capital formation grows *pari passu* with the increase in the output of final goods. If the ratio of real capital to real income remains constant, there is no deepening of capital; but if this ratio is constant and real income rises, then there is a widening of capital.

According to Douglas[2] the growth of real capital formation in England from 1875 to 1909 proceeded at an average rate of two per cent per annum; and the rate of growth of capital formation in the United States from 1890 to 1922 was four per cent per annum. The former is less than the probable rate of increase of output in England, while the latter is some-

[1] *Cf.* J. E. Meade and P. W. S. Andrews, "Summary of Replies to Questions on Effects of Interest Rates," *Oxford Econ. Papers,* no. 1; also J. Franklin Ebersole, "The Influence of Interest Rates upon Entrepreneurial Decisions in Business—A Case Study," *Harvard Bus. Rev.,* vol. xvii, pp. 35–39. The indirect effect on valuation is perhaps overlooked.

[2] Paul H. Douglas, *The Theory of Wages,* Macmillan, 1934, pp. 464–5.

what in excess of the annual rise of production in the United States. Thus, during the last fifty years or more, capital formation for each economy as a whole has apparently consisted mainly of a widening of capital. Surprising as it may seem, as far as we may judge from such data as are available, there has been little, if any, deepening of capital. The capital stock has increased approximately in proportion to real income. This is also the conclusion of Gustav Cassel;[3] while Keynes[4] thinks that real capital formation in England may have very slightly exceeded the rise in real income in the period from 1860 to the World War. If this be true, it follows that, in terms of the time element in production, which is the very essence of the capital concept, our system of production is little more capitalistic now than fifty or seventy-five years ago. It requires, in other words, a period of employment of our productive resources no longer than formerly to reproduce the total capital stock. The "waiting," so to speak, embodied in our capital accumulations is no greater today than half a century or more ago. Capital has indeed grown relative to labor. Thus the technical coefficient of production, with respect to capital, has increased. While this indicates a more intensive application of capital relative to the other factors, it does not necessarily imply any deepening of capital.

In important areas the capital stock has not increased significantly even in relation to population. This is notably true in the service industries. Moreover, in the field of housing real capital has little more than kept pace with population growth. In manufacturing as a whole it is certainly true that real capital formation has not only far outstripped population but has also risen more rapidly than physical product. The studies of Douglas for the United States and Australia show that real fixed capital invested in manufacturing increased more rapidly than physical output of manufactured goods. On the other hand, Carl Snyder's[5] data, which run in terms of value of invested capital and value of product, indicate that for important separate industries, such as textiles, iron and steel, and petroleum, capital has grown little or no faster than output since about 1890. With respect to the automobile industry, according to his findings, capital investment has risen no more rapidly than value of product, while in the electrical industries, invested capital increased at a slower rate than output after 1907. Considering the economy as a whole, including fields of economic activity other than manufacturing, there is no good evidence that the advance of technique has resulted in recent decades, certainly not in any significant measure, in any deepening of capital. Apparently, once the machine technique has been developed in any field, further mechanization is likely to result in an increase in output at least proportional to and often in excess of the net

[3]Gustav Cassel, *On Quantitative Thinking in Economics*, Oxford, 1935, chapter 6.
[4]J. M. Keynes, "Some Economic Consequences of a Declining Population," *Eugenics Review*, April, 1937.
[5]Carl Snyder, "Capital Supply and National Well-Being," *Am. Econ. Rev.*, June, 1936.

additions to real capital. Though the deepening process is all the while going on in certain areas, elsewhere capital-saving inventions are reducing the ratio of capital to output.

In order to get some insight into the effect of population growth upon capital formation, it is necessary to consider the rôle it plays in conjunction with other factors in the widening and deepening process. The widening of capital is a function of an increase in final output, which in turn is due partly to an increase in population and partly to an increase in per capita productivity, arising from causes other than a larger use of capital per unit of output. On the other hand, the deepening of capital results partly from cost-reducing changes in technique, partly (though this is probably a much less significant factor) from a reduction in the rate of interest, and partly from changes in the character of the output as a whole, with special reference to the amount of capital required to produce it.

Now the rate of population growth must necessarily play an important rôle in determining the character of the output; in other words, the composition of the flow of final goods. Thus a rapidly growing population will demand a much larger per capita volume of new residential building construction than will a stationary population. A stationary population with its larger proportion of old people may perhaps demand more personal services; and the composition of consumer demand will have an important influence on the quantity of capital required. The demand for housing calls for large capital outlays, while the demand for personal services can be met without making large investment expenditures. It is therefore not unlikely that a shift from a rapidly growing population to a stationary or declining one may so alter the composition of the final flow of consumption goods that the ratio of capital to output as a whole will tend to decline.

In the beginning stages of modern capitalism both the deepening and the widening processes of capital formation were developing side by side. But in its later stages the deepening process, taking the economy as a whole, rapidly diminished. And now with the rapid cessation of population growth, even the widening process may slow down. Moreover it is possible that capital-saving inventions may cause capital formation in many industries to lag behind the increase in output.

An interesting problem for statistical research would be to determine the proportion of investment in the nineteenth century which could be attributed (a) to population growth, (b) to the opening up of new territory and the discovery of new resources, and (c) to technical innovations. Such an analysis it has not been possible for me to make, and I shall venture only a few rough estimates together with some qualitative judgments. With respect to population growth some insight into the problem may perhaps be gained by considering first the rôle of population growth in the rise of aggregate real income. The various estimates agree that the annual rate of

growth of physical output up to the World War was roughly three per cent in western Europe and nearly four per cent in the United States. Of this average annual increase something less than half of the three per cent increase in western Europe can be attributed to population growth, while something more than half of the annual increase in the United States can be assigned to the increase in the labor supply. Thus it appears that per capita output has increased both in western Europe and in the United States at approximately one and one-half per cent per annum. This increase can be attributed mainly to changes in technique and to the exploitation of new natural resources.

We have already noted that capital formation has progressed at about the same rate as the rise in aggregate output. Thus, as a first approximation, we may say that the growth of population in the last half of the nineteenth century was responsible for about forty per cent of the total volume of capital formation in western Europe and about sixty per cent of the capital formation in the United States. If this is even approximately correct, it will be seen what an important outlet for investment is being closed by reason of the current rapid decline in population growth.

Obviously the growth of population affects capital formation most directly in the field of construction, especially residential building. From decade to decade the increase in the number of dwellings had maintained a close relation to the increase in the population. In the decade of the twenties, however, the increase in houses ran about twenty-five per cent in excess of previous decennial increases in relation to population. According to Kuznets, during the seven prosperous years 1923 to 1929, a quarter of the net capital formation was residential building. But the effect of population growth on capital formation is, of course, felt in other spheres as well. This is notably true of all the various municipal and public utilities, and also of the manufacture of essential consumers' goods.

An interesting excursus would lead us into a consideration of the problem how far an increase in population itself contributed to a more efficient technique and so was in part responsible for the rise in per capita real income. According to the older Malthusian view, the growth of population would act counter to the effect of technological progress upon per capita productivity, and would thus slow down the rise in per capita real income. If this were correct, population growth considered by itself alone would tend to check the rise in per capita consumption, and this in turn, *via* the so-called *Relation*, would affect the volume of capital formation. According to the optimum population theory, however, it may not infrequently be the case, and indeed probably was during the greater part of the nineteenth century, that population growth itself facilitated mass production methods and accelerated the progress of technique. If this be correct, population growth was itself responsible for a part of the rise in per capita real in-

come, and this, *via* the influence of a rising consumption upon investment, stimulated capital formation. Thus it is quite possible that population growth may have acted both directly and indirectly to stimulate the volume of capital formation.

It is not possible, I think, to make even an approximate estimate of the proportion of the new capital created in the nineteenth century which was a direct consequence of the opening up of new territory. The development of new countries was indeed so closely intertwined with the growth of population that it would be difficult to avoid double counting. What proportion of new capital formation in the United States went each year into the western frontier we do not know, but it must have been very considerable. Apparently about one-fourth of the total capital accumulations of England were invested abroad by 1914, and one-seventh of those of France.

These figures, while only suggestive, point unmistakably to the conclusion that the opening of new territory and the growth of population were together responsible for a very large fraction—possibly somewhere near one-half—of the total volume of new capital formation in the nineteenth century. These outlets for new investment are rapidly being closed. The report on *Limits of Land Settlement* by President Isaiah Bowman and others may be regarded as conclusive in its findings that there are no important areas left for exploitation and settlement. So far as population is concerned, that of western Europe has already virtually reached a standstill; but that in eastern Europe, notably in Russia, is still growing, and so also is that in the Orient. And much of this area will probably experience a considerable industrialization. But it is not yet clear how far the mature industrial countries will participate in this development through capital export. Russia still has a long way to go before she becomes completely industrialized; but foreign capital is not likely to play any significant rôle in this process. India will offer some opportunity for British investment, but the total is likely to be small relative to the volume of British foreign investments in the nineteenth century. China and the Orient generally offer, in view of the present and prospective turmoil in that area, relatively meager investment opportunities. At all events, no one is likely to challenge the statement that foreign investment will in the next fifty years play an incomparably smaller rôle than was the case in the nineteenth century.

Thus the outlets for new investment are rapidly narrowing down to those created by the progress of technology. To be sure, the progress of technology itself played in the nineteenth century a decisive rôle in the opening of new territory and as a stimulus to population growth. But while technology can facilitate the opening of new territory, it cannot create a new world or make the old one bigger than it is. And while the advance of science, by reducing the death rate, was a major cause of the vast nineteenth-century increase in population, no important further gains in this

direction can possibly offset the prevailing low birth rate. Thus the further progress of science can operate to open investment outlets only through its direct influence on the technique of production.

We are thus rapidly entering a world in which we must fall back upon a more rapid advance of technology than in the past if we are to find private investment opportunities adequate to maintain full employment. Should we accept the advice of those who would declare a moratorium on invention and technical progress, this one remaining avenue for private investment would also be closed. There can be no greater error in the analysis of the economic trends of our times than that which finds in the advance of technology, broadly conceived, a major cause of unemployment. It is true that we cannot discount the problem of technological unemployment, a problem which may be intensified by the apparently growing importance of capital-saving inventions. But, on the other side, we cannot afford to neglect that type of innovation which creates new industries and which thereby opens new outlets for real investment. The problem of our generation is, above all, the problem of inadequate private investment outlets. What we need is not a slowing down in the progress of science and technology, but rather an acceleration of that rate.

Of first-rate importance is the development of new industries. There is certainly no basis for the assumption that these are a thing of the past. But there is equally no basis for the assumption that we can take for granted the rapid emergence of new industries as rich in investment opportunities as the railroad, or more recently the automobile, together with all the related developments, including the construction of public roads, to which it gave rise. Nor is there any basis, either in history or in theory, for the assumption that the rise of new industries proceeds inevitably at a uniform pace. The growth of modern industry has not come in terms of millions of small increments of change giving rise to a smooth and even development. Characteristically it has come by gigantic leaps and bounds. Very often the change can best be described as discontinuous, lumpy, and jerky, as indeed D. H. Robertson has so vividly done. And when a revolutionary new industry like the railroad or the automobile, after having initiated in its youth a powerful upward surge of investment activity, reaches maturity and ceases to grow, as all industries finally must, the whole economy must experience a profound stagnation, unless indeed new developments take its place. It is not enough that a mature industry continues its activity at a high level on a horizontal plane. The fact that new railroad mileage continued to be built at about the same rate through the seventies, eighties and nineties was not sufficient. It is the *cessation of growth* which is disastrous. It is in connection with the growth, maturity and decline of great industries that the principle of acceleration operates with peculiar force. And when giant new industries have spent their force, it *may* take a long

time before something else of equal magnitude emerges. In fact nothing has emerged in the decade in which we are now living. This basic fact, together with the virtual cessation of public investment by state and local governmental bodies, as indicated by a decline of $2,000,000,000 in their net public debt since 1932, explains in large measure the necessary rise in federal expenditures.[6]

Spiethoff was quite right when he argued that a vigorous recovery is not just spontaneously born from the womb of the preceding depression. Some small recovery must indeed arise sooner or later merely because of the growing need for capital replacement. But a full-fledged recovery calls for something more than the mere expenditure of depreciation allowances. It requires a large outlay on new investment, and this awaits the development of great new industries and new techniques. But such new developments are not currently available in adequate volume. It is my growing conviction that the combined effect of the decline in population growth, together with the failure of any really important innovations of a magnitude sufficient to absorb large capital outlays, weighs very heavily as an explanation for the failure of the recent recovery to reach full employment. Other factors are certainly significant and important, particularly our failure to control the cost structure and to grapple effectively with specific situations, such as those presented by the railroads and by building construction.

We have noted that the approaching cessation of population growth and the disappearance of new territory for settlement and exploitation may cut off a half or more of the investment outlets which we were wont to make in the past. We are thus compelled to fall back upon that measure of capital formation which is associated with the advance of technique and the rise in per capita output. But current institutional developments are restricting even this outlet. The growing power of trade unions and trade associations, the development of monopolistic competition, of rivalry for the market through expensive persuasions and advertising, instead of through price competition, are factors which have rightly of late commanded much attention among economists. There is, moreover, the tendency to block the advance of technical progress by the shelving of patents.

Under vigorous price competition, new cost-reducing techniques were compulsorily introduced even though the scrapping of obsolete but undepreciated machinery entailed a capital loss. But under the monopoly principle of obsolescence new machines will not be introduced until the undepreciated value of the old machine will at least be covered by the economies of the new technique. Thus progress is slowed down, and outlets for new capital formation, available under a more ruthless competitive society, are cut off. Capital losses which could not be avoided under rigorous price competition can be and are avoided under an economic system

[6] *Debts and Recovery 1929 to 1937*, The Twentieth Century Fund, 1938, p. 230.

more closely integrated by intercorporate association and imperfect competition. If we are to save the one remaining outlet for private capital formation, deliberate action of a far bolder character than hitherto envisaged must be undertaken in order to make the price system and free enterprise sufficiently responsive to permit at least that measure of capital formation to which the rate of technological progress had accustomed us in the past.

Yet even though this much were achieved, it is necessary to recognize that such a rate of progress would not provide sufficient investment outlets to give us full employment of our resources. With a stationary population we could maintain as rapid a rise in per capita real income as that experienced in the past, by making annually only half the volume of new investment to which we have been accustomed. A volume of investment adequate to provide full employment could give us an annul percentage increase in per capita output greatly in excess of any hitherto attained.

Various measures have been offered to maintain full employment in the absence of an adequate rate of technological progress and of the development of new industries. Consumption may be strengthened by the relief from taxes which drain off a stream of income which otherwise would flow into consumption channels. Public investment may usefully be made in human and natural resources and in consumers' capital goods of a collective character designed to serve the physical, recreational and cultural needs of the community as a whole. But we cannot afford to be blind to the unmistakable fact that a solution along these lines raises serious problems of economic workability and political administration.

How far such a program, whether financed by taxation or by borrowing, can be carried out without adversely affecting the system of free enterprise is a problem with which economists, I predict, will have to wrestle in the future far more intensely than in the past. Can a rising public debt owned internally be serviced by a scheme of taxation which will not adversely affect the marginal return on new investment or the marginal cost of borrowing? Can any tax system, designed to increase the propensity to consume by means of a drastic change in income distribution, be devised which will not progressively encroach on private investment?[7]

As so often in economic life, we are confronted by a dilemma. Continued unemployment on a vast scale, resulting from inadequate private investment outlets, could be expected sooner or later to lead straight into an all-round regimented economy. But so also, by an indirect route and a slower process, might a greatly extended program of public expenditures. And from the standpoint of economic workability the question needs to be raised how far such a program can be carried out in a democratic society without raising the cost structure to a level which prevents full employ-

[7]Joseph J. Spengler, "Population Movements, Employment, and Income," *Southern Econ. Jour.*, Oct., 1938.

ment. Thus a challenge is presented to all those countries which have not as yet submitted to the yoke of political dictatorship. In one of our round tables we are discussing divergencies in the success of governmental spending in democratic countries and in totalitarian states. Totalitarian states have the great advantage that they can rigorously check the advance of costs, including wage rates, while engaging in an expansionist program of public investment. Democratic countries cannot in modern times escape from the influence exerted by organized groups upon the operation of the price system. From the standpoint of the workability of the system of free enterprise, there emerges the problem of sovereignty in democratic countries confronted in their internal economies with powerful groups—entrepreneurial and wage-earning—which have robbed the price system of that impersonal and non-political character idealized in the doctrine of laissez-faire. It remains still to be seen whether political democracy can in the end survive the disappearance of the automatic price system.

Thus we are confronted with various alternatives. On the one side, there is the proposal to risk a negative governmental policy in the expectation that the recuperative forces to which we have long been accustomed will, in the absence of political interference, re-assert themselves. On the other side, there is the proposal to go forward under full steam with unrestrained governmental expansion until full employment has been reached. Those who have no doubts whatever about the correctness of their economic analyses will not hesitate to make a bold choice of policy. But others, impressed with the stubborn economic realities of a rapidly changing world, on the one side, and the frailties of human nature in its power to make the appropriate adaptation to change, on the other, will not be so sure, and may prefer to take a course that risks neither a negative policy nor a breakdown of collective management.

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There are no easy answers to the problems that confront us. And because this is true, economists will not perform their function if they fail to illuminate the rapidly shifting course of economic development, and through such neglect unwittingly contribute to a dangerous lag in adjustments to change. Equally they will not perform their function if they fail to disclose the possible dangers which lurk in the wake of vastly enlarged governmental activities. Choice indeed must be made, and scientific analysis and painstaking research can aid by exploring the probable consequences of alternative choices. The problems which I have raised offer a challenge to our profession. The great transition, incident to a rapid decline in population growth and its impact upon capital formation and the workability of a system of free enterprise, calls for high scientific adventure along all the fronts represented by the social science disciplines.