

ECONOMIC EPOCHS AND THEIR INTERPRETATION

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This study is concerned with the economic performance of advanced capitalist countries. Since 1820 the total product of the countries considered here has increased seventy-fold, population nearly five-fold, per capita product fourteen-fold and real per capita consumption almost tenfold. Annual working hours are down by half and life expectation has doubled. The main engine of growth has been technical progress, with capital formation as the major instrument by which it was exploited to increase output.

The reasons for the vigour of capitalist performance can be more clearly apprehended when we contrast its driving forces with those of earlier times.

The rough schema of Table 1 divides past experience into six historical epochs and shows the major determinants of economic performance in each of these. In this evolutionary sequence the three factors of production (natural resources, labour, and capital) have been increasingly augmented by technical progress and education. The efficiency of resource allocation has been improved through better division of labour. From time to time, some countries increased their income by plundering or exploiting others, particularly in the period of ancient imperialism and merchant capitalism, but this has not been an important factor in capitalist progress.

With the exception of Japan, all the advanced countries are European or (like Australia, Canada, and the USA) are off-shoots of Europe, so the present review of economic epochs refers mainly to European conditions. In the past 1,500 years, European countries have been through four epochs: "agrarianism" (500-1500), "advancing agrarianism" (1500-1700), "merchant capitalism" (1700-1820), and "capitalism" (1820-till now).

This categorisation is meant to be a rough description of the progressive evolution of the major forces determining production potential. It is not intended to describe specific forms of property, class relationships, or modes of exploitation which figure in Marxist presentations of growth stages (1). It is set out in broadly chronological order of the evolution of production potential, but all countries have not moved in steady succession through all these stages. Some have skipped a stage; there have been cases of relapse; and there has been coexistence of economies operating in different modes.

In terms of characteristic amplitudes, the long-term trends of economic performance in the last four epochs are compared in Table 2. For the period since 1820 the magnitudes are reasonably well established in the evidence presented in Appendices A and B of Maddison (1982). They show very much faster growth than the earlier periods, for which the per capita estimates are conjectures. However, it is unlikely that per capita growth rates could have been quicker in 1500-1820 than is suggested, for they imply a per capita level (in 1985 US prices) of only \$500 in 1500 (about the same level as in Bangladesh today) and the .25 growth postulated for 1700-1820 is roughly the same as that in the UK for that period.

Advancing Agrarianism

After the collapse of the Roman Empire and its communications system, Europe relapsed into agrarianism. For a millennium there was little net progress in population and none in per capita income. Within this generally stagnant situation there were sizeable fluctuations. There were two major declines in population with subsequent recoveries. The first population drop came after the fall of the Empire in a wave of epidemic disease in the sixth and seventh centuries, and the other in the fourteenth century after the bubonic plague epidemic known as the Black Death. There is some evidence that when population fell

after these demographic catastrophes, the standard of living rose temporarily because there were several decades during which there was more land available per capita. Hence the demographic and living standard fluctuations were of an inverse character, meaning that the output trend was probably smoother than either of its components (2).

Table 1
Determinants of Production Potential in Six Economic Epochs

Epochs	Output a function of
(1) Pre-agrarian (hunting, fishing, findin	(N, L)
(2) Agrarianism	(N', L', K)
(3) Ancient imperialism	(N', L'', K*) + p
Reversion to agrarianism	(N', L', K)
(4) Advancing agrarianism	(N', L', K')
(5) Merchant capitalism	(N', L'', K'') + p'
(6) Capitalism	(N'', L''', K''') ^s + p''

N	= natural resources
N'	= natural resources appropriated and maintained
N''	= natural resources developed and augmented
L	= raw labour
L'	= labour force with bare modicum of skills, defensively oriented elite unlikely to generate or absorb new technology
L''	= ordinary labour with a modicum of skills plus an efficient bureaucratic military elite
L'''	= labour force with formal education and the on-the-job training, scientific-technical and military-bureaucratic elite
K	= moderate stock of working capital, investment sufficient to take care of replacement and widening (provision of stock for additional workers)
K*	= as for K, but with greater investment in roads and urban facilities
K'	= as for K, with very gradual expansion of fixed capital per head (deepening)
K''	= as for K', except that capital deepening is more important
K'''	= moderate stock of working capital supplemented by much bigger stock of fixed capital. Investment in all types of capital (replacement, widening, and deepening) is a major vehicle for transmitting technical progress. Technical progress tangible and perceived as compared with K' and K'' where it was present but imperceptible
s	= economies of scale and specialization, particularly through international trade
p	= plunder (unrequited levies on products and manpower of colonized areas)
p'	= gains from monopolistic trading privileges
p''	= residual gains from colonialism

Table 2
Performance Characteristics of Four Epochs
 (average annual compound growth rates)

	Population	GDP per head	GDP
Agrarianism, 500-1500	0.1	0.0	0.1
Advancing agrarianism, 1500-1700	0.2	0.2	0.4
Merchant capitalism, 1700-1820	0.4	0.2	0.6
Capitalism, 1820-1980	0.9	1.6	2.5

Source: Population 500-1500 from J.C. Russell, "Population in Europe 500-1500", *Fontana Economic History of Europe*, vol. 1, Collins, London, 1972, p. 36, other epochs from Appendix B ; per capita income 500-1820 by inference as described in text, 1820 onwards from Appendices A and B.

For 1500-1700 the rate of progress was also very poor by present standards, but clearly better than in the previous millenium. There were no further demographic setbacks on the scale of the Black Death, though the pace of population growth was a meagre crawl in spite of high fertility. Per capita output grew at too slow a pace to be perceptible to contemporaries. Nevertheless population of these countries grew by half in these two centuries, and per capita output may also have risen by half, though productivity rose less because the increased output required longer working hours.

The above interpretation of the situation under advanced agrarianism is similar to that of analysts such as Kuznets and Landes, who have suggested that the long run trend of European living standards and productivity was positive from 1500 to 1700, and perhaps for several earlier centuries (3). It is a more dynamic interpretation than that of historians such as LeRoy Ladurie and Abel, who take a grimmer view of performance in this period, because they are disciples of Malthus.

Thomas Malthus (1766-1834) first published his views on factors determining economic performance in 1798. He portrayed the general situation of humanity as one where population pressure put such strains on the ability of natural resources to produce subsistence that equilibrium was attained only by various catastrophes - such as famine, disease, and wars - which brought premature death on a large scale and which he described as "positive" checks. Later he advocated introduction of "preventive" checks, such as sexual abstinence, as the only way to avoid such calamities.

Malthus's influence has been strong and persistent, in part because of the forceful rhetoric in which he first couched his simple argument. Thus, while no one would consider his theory as valid for the capitalist epoch, many respectable historians consider it applicable to earlier periods. Here is a sample of his style of argument: "The power of population is so superior to the power in the earth to produce subsistence for man, that premature death must in some shape or other visit the human race. The vices of mankind are active and able ministers of depopulation. They are the precursors in the great army of destruction; and often finish the dreadful work themselves. But should they fail in this war of extermination, sickly seasons, epidemics, pestilence, and plague advance in terrific array, and sweep off their thousands and ten thousands. Should success be still incomplete, gigantic inevitable famine stalks in the rear, and with one mighty blow levels the population with the food of the world" (4).

In fact, the situation after 1500 was not as Malthus suggested, even though most economies were operating under a low-income ceiling because of slow technological progress. The population was indeed subject to mini-famines when bad weather occurred, but not to endemic food shortages lasting over periods of many decades or longer, as some of his disciples suggest.

There are several reasons for disagreeing with Malthus, which are worth stating in view of the

persistent popularity of his ideas.

1. European fertility was not at a biological maximum, but already reflected the operation of preventive checks on a significant scale. Unlike Asian countries, Europeans generally lived in conjugal rather than extended families, and in order to sustain living standards marriage did not take place at puberty but in the mid-twenties. Sexual restraint before marriage was enforced with reasonable success by a priesthood who set an example of celibacy, so that a substantial fraction of the population was celibate. These habits changed temporarily when Europeans emigrated to countries with abundant land, but their existence in pre-capitalist Europe has been firmly established by recent French and British demographic research (5).

2. "Average" living standards were well above subsistence. In all countries there was a substantial hierarchy of rulers, upper, and middle classes. The size of this group varied between countries for institutional and political reasons. For England in 1688 we have Gregory King's estimates which show average income per head of almost £8 but the poorest quarter of the population (cottagers and paupers) survived on a consumption level only 28 per cent of this (6).

3. There was still a margin of unused land, and it is clear from existing demographic studies that there was migration within Europe. There were much bigger reserves in America, Australia, Siberia, and Africa, which were to offer possibilities for international migration at a later period.

4. The intensity with which land was cultivated could be expanded considerably in most cases by greater per capita labour inputs (7). In the Middle Ages there were very long off-seasons in which little work was done, and a great deal of land lay fallow. Later generations worked harder, reduced the fallow area and increased land productivity by pushing agricultural practice closer to that in horticulture.

5. Some of the major demographic setbacks cited by Malthusian pundits for this period (e.g. in the seventeenth century) were not due demonstrably to pressure of population on land but to different causes, such as disease or war. A fundamental weakness of the Malthusian argument is that its central thesis is based on the land-labour dichotomy, but death from disease and war are often used as evidence as if these catastrophes were ultimately due to food shortage.

6. Finally, the advancing agrarian economy was not one of complete technological stagnation. Medieval innovations had included windmills, horseshoes, horse harness, heavy ploughs, the haystack, the scythe, marling, fertilization, and the three-field rotation system. These innovations spread rather gradually, but they were certainly helping to increase agricultural output in northern Europe by 1500-1700.⁸ Innovation was much slower in this epoch than it is now because the main locus of production was in agriculture, where innovation was too risky for most of the participants and often inhibited by tenure institutions. In urban handicrafts, guild restrictions also limited possibilities for change. Entry to skilled occupations was carefully controlled and technical knowledge was regarded as a mystery not to be shared with those outside the recognized confraternity. But the literate group of the population was no longer confined to a priesthood training to conform with tradition rather than to innovate. After the introduction of printing around 1500, diffusion of knowledge was speeded up, and written communication took place in the vernacular rather than in Latin.

For these reasons, I conclude that the basically agrarian civilization of Europe in 1500-1700 was an advancing one, in which technical progress and a modicum of capital formation played some role. Nevertheless, there is an alternative Malthusian interpretation of this period in western European history which is advanced by some very respectable historians.

The most distinguished Malthusian interpreter is Emmanuel LeRoy Ladurie, the most versatile and imaginative of the French economic historians of the *Annales* school. This group practises a form of "total history" which tries to give a vivid representation of "material" (everyday) life in the past, and the natural conditions that determined it. It discards the conventional political, diplomatic, military, and dynastic coverage, and generally ignores countries in favour of regional or global characterizations. Their

approach is cross-disciplinary, and the analysis is constructed around themes rather than chronology. It tries to produce an evocative picture of the structural unity of an epoch, interpreted in several dimensions. The school makes considerable use of quantitative material and long time series (*histoire sérielle*). These include estimates of prices and wages as well as the fascinating reconstruction of regional population history made possible by modern French demographic techniques. Ladurie himself has also explored climatic history by using records of wine harvests.

Ladurie strongly emphasised the long-term stability of the French economy from 1300 to 1700, both in demographic and per capita terms. The immobile trend was interrupted by major catastrophes, but once recovery took place the ceiling on performance reasserted itself. He first put forward the thesis of stagnant income (for 1500-1700) in a regional study of Languedoc peasants (written in 1960) which explicitly espoused a Malthusian interpretation in which there was a tension between the dynamism of population and the rigidity of agricultural production which produced recurrent and prolonged population setbacks (9). A second major study (in 1977) maintained the same conclusions in a survey drawing on a new generation of regional studies and using better data drawn from ecclesiastical tax records to infer, from the proportion taken in tithes, a rough estimate of total crop production (10). Ladurie's statistical material on income levels is used illustratively rather than analytically, and virtually always for regions. There is little discussion of the problem of adding up data for regions to get a cohesive picture for France as a whole, there is no discussion of the role of capital formation and technical change, or of the possible dimensions of inter-regional migration.

In both the major Ladurie studies on long-term stagnation it is clear that disease and war were more important agents of demographic catastrophe than hunger. In the second study, he appears somewhat embarrassed by the Malthusian label he had earlier used. He sketched a vague general systems theory of demographic controls in men and animals which suggested somewhat unconvincingly that suicide and infanticide were more important means of population control than late marriage before the eighteenth century (11). He now characterised his approach differently, with almost no reference to Malthus but to a broader ecosystem and the trauma of war. He has also written at length on microbic migration, which has had devastating effects on population independent of hunger (12). It is clear that he considered the real ceiling on per capita income growth to be a stagnant technology rather than shortage of land. He now tends to describe his approach as Ricardian rather than Malthusian.

Wilhelm Abel, the German agrarian historian, carried pessimism further than Ladurie, and suggested that real living standards in Germany and England actually fell from the first half of the fourteenth to the first half of the eighteenth century (13). Abel's analytical framework is "Malthusian" in the sense used by Ladurie in 1960. His conclusions on the long-term trends in living standards in Germany and England are derived by dividing some very long-term series on what are purportedly representative wages by the prices of wheat or rye. To cap the Malthusian argument and show the inverse relation of real wages to population *à la Malthus*, he juxtaposes an index of building wages in the South of England with the movement of population in "central Europe" (England, France, and Germany). It is very odd that he should take an index for a small group of British artisans as representative of European per capita income levels, and his population estimates are also suspect. He shows a decline of 4 million in French population from 1620 to 1740, whereas most other estimators record a similar move in the opposite direction.

At one point it appeared that the *Annales* school had deviated from the Ladurie to the Abel position on real incomes, when Braudel and Spooner concluded an obscure argument by the assertion that "from the late fifteenth century until well into the beginning of the eighteenth century, the standard of living in Europe progressively declined" (14). Later both Braudel and Spooner retreated to the Ladurie position (15).

Merchant Capitalism

In the merchant capitalist epoch, the leading European countries exploited their superior technology in navigation, shipbuilding and armaments to develop international trade through monopolistic trading companies. In the earlier case of Spain, mercantile aims and colonial policy were not merchant capitalist but more akin to those of ancient imperialism. Having squeezed out the plunder, Spain declined. But in the Netherlands, France, and the UK, the overseas empire of the merchant capitalist period had a more beneficial effect on the productive capacity of the domestic economy, because it not only augmented capital resources but helped considerably to enlarge the size of markets.

In the merchant capitalist period there was also an improvement in internal transportation, which helped break down the isolation of self-sufficient village economies and created new possibilities for economies of scale and specialisation.

For the UK, the merchant capitalist experience was useful in providing a particularly large market area for textiles which may well have stimulated technical progress in this area.

Adam Smith (1723-90)

The driving forces of the merchant capitalist epoch were brilliantly analysed in 1776 in his book *The Wealth of Nations*. Smith emphasized the role of capital deepening in economic growth, the opportunities for economies of scale and specialization, and the role that policy could play in accelerating growth. He greatly broadened the significance of the historical approach for growth analysis by using it comparatively. He arrayed countries in an order that corresponds basically with the modern idea of real income per head and built an analytical scheme which gave a rough explanation of why they were thus located. There were some drawbacks in his approach; e.g., he did not really distinguish between the benefits accruing from technical progress and economies of scale, he overstressed natural harmony of interest between nations, and he largely ignored the plunder element in the success of merchant capitalism.

In fact, it is not surprising that Smith gave much less stress to technical progress than to economies of scale. He was contemplating a range of national economic performance which varied from perhaps \$500 average per capita income to \$1500 using our unit of account. His ordering was roughly as follows (excluding what he calls 'naked savages' in pre-agrarian societies):

Netherlands

England

France

British North American colonies

Scotland

Spanish colonies in America

China

Bengal (depressed by the East India Company's plundering)

Smith was more concerned with policy action that would help push a country nearer to the high-income frontier (located in the Netherlands) by using existing best practice technology than he was with the possibilities for further progress. He gave greater stress to the opportunities arising from removing economic backwardness than to those from new technology.

Hence he treats capital mainly as a stock which can be increased in per capita terms to make it possible to use more complex methods of production rather than new techniques. In fact, in his definition, capital consisted of a fund to meet the cost of workers' subsistence, as well as provision of tools and equipment. The former element of circulating capital was bigger than the element of fixed capital. It is interesting that his most famous example of the potential gain from exploiting more complex processes

relates to the pin-making industry, which was by no means a new one. He was not of course unaware of technical change, but seemed to regard it as a matter of improvement engineering rather than creation of new products or processes.

In discussing policy, Smith stressed the natural harmony of interests of all parties from allocation of resources in free markets, and like his French contemporaries, the Physiocrats, he advocated the case for *laissez-faire* policies of non-intervention. In this he was a very successful advocate because his argument gradually won over British official opinion, and British influence diffused his policy message world-wide.

It should be added that Smith had in mind a rough dichotomy between advanced merchant capitalist countries like England and France, where policy changes were regarded as a completely effective way of moving from where they were on the income scale to the frontier position of the Dutch, and the situation in China and India. In the latter group, there were bigger institutional constraints on the adoption of sensible policies, but Smith also had in mind a more moderate view of the Malthus position; i.e., they were, because of more ancient settlement, in a situation where there was greater pressure on natural resources, and less scope for saving. Similarly, he considered North America to be in a different situation, where total output could grow much faster because of the existence of empty land, but where per capita growth and levels would not necessarily be better than in the advanced nations of Europe.

Capitalism

The main difference between the capitalist and the merchant capitalist epoch was the acceleration in the pace of technical progress, which required a major increase in the rate of fixed capital formation. The growth of capital stock per worker greatly increased, and all types of capital (replacement, widening, and deepening) were rendered more productive because new vintages embody a sustained and substantial growth in technical knowledge. A significant difference from merchant capitalism is that the economic performance of the leading capitalist countries has not generally depended on beggar-your-neighbour exploitation (plunder) of other countries. This does not mean that such practices disappeared, but they were much less significant, except in the case of the UK when its capitalist growth started. Another important characteristic of the capitalist epoch has been the steadily increasing general level of education of the labour force. In 1820 the average member of the labour force in our group of capitalist countries probably had less than two years' education; by 1989 the average had risen to eleven years. This has been necessary to adapt successfully to rapid economic change, and has also been of help in developing the stock of economically useful knowledge. There has also been a major acceleration in the growth of international trade and specialization and major changes in economic structure which have been associated with productivity growth in the capitalist epoch.

In order to clarify the present characterization of the driving forces in capitalist development, it may be helpful to comment on the approach adopted by three major economists who advanced their own schema of the capitalist production process: Ricardo (1772-1823), Marx (1818-83), and Schumpeter (1883-1950).

Marx and Schumpeter both had an extremely ambitious approach to capitalist development, involving a socio-political theory, historical and comparative perspective, and vast erudition in the history of economic thought.¹⁶ Ricardo, by contrast, had a minimum of formal education, a narrower perspective, and a greater taste for abstract ideas. Nevertheless, he applied his luminous mind to production of a rigorous schema, which has had an enormous influence on subsequent analysis. He was also more concerned with pragmatic policy questions than Marx and Schumpeter.

David Ricardo (1772-1823)

Ricardo recognized the augmentation in productive power that machinery had brought and that held out perspectives of substantial economic growth in the non-agricultural sector. However, being strongly influenced by Malthus, he judged that productivity growth was likely to be much slower in agriculture than in industry. Because the supply of land was fixed, population was growing, and the increased demand for food would lead to use of less fertile land. As population grew the relative price of food would therefore rise, and this would impact unfavourably on industrial costs. Ricardo assumed that wages tend to be at a subsistence level, and thus, when food prices rise, wages must also rise if workers are to survive. As wages rose, industrial profits would be squeezed, and this fall in profits would eventually bring economic expansion to a halt. The obverse of the profit squeeze was the rise in the share of landlords' rents. Thus there was a clash of interests between the new class of industrialists and the landlords. As a temporary relief for this dilemma, Ricardo advocated reduction of duties on imported food, which would keep wages down and postpone the profit squeeze.

Ricardo's argument is advanced in abstract arithmetic terms without reference to history or institutions.¹⁷ Thus it is difficult to categorize his judgement of capitalist potential very clearly. It was certainly more optimistic than that of the young Malthus, and considerably less dynamic than that of Marx and Schumpeter, neither of whom had a two-sector model with scarcity of natural resources as a drag. Some of Ricardo's followers (e.g. J.S. Mill) assumed that his schema implied the advent of economic stagnation within the foreseeable future, and that it would be a stagnation at income levels (for workers) rather near to subsistence. This turned out to be a poor judgement on subsequent capitalist performance, though it can hardly be attributed to Ricardo himself. The other impact of Ricardo has been longer-term. He stimulated the use of two-sector models and theories that expect growth to come to a halt because of natural limits; e.g. Jevons' theory about coal shortage, the Club of Rome's concern with natural limits and ecology, and pessimism about oil shortages. Ricardian thinking about the industrial sector as the more or less exclusive locus of rapid technical change has also had a tremendous influence on subsequent thought, e.g. the notion of an 'industrial' rather than a scientific-technical revolution, the intense concern of many economists with terms of trade between agriculture and industry, or with the 'dangers' of de-industrialization.

Karl Marx (1818-1883)

There are many contradictions and paradoxes in the analysis of Marx and Schumpeter, and the following is restricted to what Schumpeter called their 'vision', unencumbered by detail. Marx recognized, more clearly than most of his contemporaries, the enormous productive power of capitalism as compared with that of preceding epochs. He scorned Malthus, and rejected Ricardo's pessimism about the drag to progress associated with the pressure of population on resources. He stressed the enormous growth of productive power represented by the transition from manufacture to machinofacture, and the importance of accelerated accumulation of fixed capital as the mainspring of economic progress. He expected a continued expansion of trade and concentration of production into bigger units, both of which would provide continuing economies of scale. He clearly considered that European plunder and monopolistic trading exploitation of the rest of the world had been a necessary feature of merchant capitalism, but he did not make any substantial claim (as some subsequent Marxists have done) that it was a necessary feature of the capitalist epoch.

Marx speculated on the possibility that the momentum of capitalist productive performance might weaken because maintenance of productivity growth might be increasingly inhibited by the difficulty of sustaining technical progress. Sustained progress would require an increased ratio of fixed

capital to output, and this might reduce the rate of profit in the long run. However, he put forward several reasons for thinking that this possibility might be offset by countervailing forces. Hence, though Marx expected capitalism's ultimate collapse in favour of socialism, his breakdown hypothesis is basically socio-political rather than economic. He expected increasing polarization of the interests of workers and capitalists, and the breakdown was expected as a result of the victory of the worker's interest, which would then abolish private property as a means of production. However, Marx did not present socialism as a stationary state, so under socialism, as with capitalism, Marx presumably would have expected the mainsprings of growth to be technical progress and capital accumulation. The main difference between capitalism and socialism would be a more equal income distribution, the elimination of unemployment, and a termination of business cycles.

Marx considered a "reserve army" of unemployed to be a major prerequisite of capitalist economies. It was necessary to keep wages low relative to profits. He did not have a subsistence theory of wages, but a bargaining theory. When demand was high, as in business booms, the bargaining position of labour would improve and profits would be squeezed. In a depression the bargaining position of labour would weaken and the profit outlook would improve. He considered these oscillations in the labour market situation to be the major cause of cyclical fluctuations under capitalism, and he took a ten-year cycle to be typical.¹⁸

As Marx was not interested in the survival of the capitalist system, he was not really concerned with economic policy, except in so far as the labour movement was involved. There, his argument was concentrated on measures to limit the length of the working day, and to strengthen trade union bargaining power. His analysis was also largely confined to the situation in the leading capitalist country of his day - the UK - and he did not consider the policy problems of other western countries in catching up with the lead country (as Friedrich List did). In so far as Marx was concerned with other countries, it was mainly with poor countries which were victims of western imperialism in the merchant capitalist era.

Joseph Schumpeter (1883-1950)

Schumpeter gave greater stress to the role of technical progress and less to the role of capital accumulation than Marx did. He rejected completely the Malthus-Ricardo type constraints arising from pressure of population on fixed natural resources (19). He also rejected the view that there was any necessary element of imperialist exploitation in capitalist development (20).

Schumpeter made a sharp distinction between the way an economy would operate as a "circular flow" if technology were static, and the way it operates in the real world of "economic development" where "technique and productive organization" are changing. In a capitalist economy, "economic life changes its own data by fits and starts"; the system "so displaces its equilibrium point that the new one cannot be reached from the old one by infinitesimal steps. Add successively as many mail coaches as you please, you will never get a railway thereby."

Schumpeter did not view the capital stock as the incarnation of technical progress, but stressed the central role of the entrepreneur: "Capital is nothing but the lever by which the entrepreneur subjects to his control the concrete goods which he needs, nothing but a means of diverting the factors of production to new uses, or of dictating a new direction to production." He distinguished sharply between the entrepreneurial role of innovation and that of owning or managing assets. Only the entrepreneur creates profits as distinguished from "interest", which is the return on ownership. Interest comes in a steady stream, but profits are "transitory and ever-changing" because the entrepreneur can capture the benefits of innovation only temporarily. Once the viability of the innovation is demonstrated, it will be copied by imitators. It will cease to be an innovation and, having lost its freshness, will drop back into the domain of the circular flow (21).

Schumpeter regarded innovation as “difficult and only accessible to people with certain qualities”; “only a few people have these qualities of leadership”. Hence innovation comes in jerks or “swarms”, discontinuously in time. The economy thus progresses through a series of cycles. One round of innovations gathers momentum as the innovator attracts imitators; then there is stagnation, which is eventually broken by some new entrepreneur. Thus the entrepreneur is the hero of economic development, and his heroism is all the more legitimate because in each wave new men emerge, as “the function of the entrepreneur itself cannot be inherited” (p. 79).

Schumpeter described the nature of economic development as the “carrying out of new combinations”, which he defined rather widely as follows (in fact, only the first two of these represents what is conventionally included in the notion of technical progress):

1. introduction of new goods;
2. introduction of new methods of production;
3. opening a new market;
4. conquest of a new supply of raw materials;
5. new organization of an industry.

Schumpeter’s provocative approach was a major break with the academic tradition in economics, which had ignored Marx and not taken much interest in growth problems for several decades. He put technical change at the centre stage of capitalist development, and in his discussion of the temporary character of innovation profit, brought out clearly the non-appropriability of knowledge which is the major reason it is so difficult to capture its role in a production function. One aspect of his approach that is difficult to accept is the notion that entrepreneurship is so scarce a factor of production. His own later argument, that innovation can be institutionalized in large firms, itself contradicts the proposition. If the entrepreneur is disenthroned in Schumpeter’s schema, then we must fall back on capital as the vehicle for technical change.

Like Marx, Schumpeter was not interested in policy to promote growth in the way in which Adam Smith was, nor did he discuss problems of relative backwardness within the process of capitalist development. Because Smith was so heavily oriented to policy, his unit of analysis was the performance of particular nations. Marx and Schumpeter in their main theoretical work argue in more general terms, so their reference unit is not so clearly national, but in fact they were analysing the capitalist process in the lead country. One reason for the absence of policy discussion is that both Marx and Schumpeter expected the capitalist system to collapse for different reasons. However, it is a little odd that Schumpeter did not discuss patents, R and D, and invention, which must move one step ahead of the entrepreneurial act. Perhaps he thought that innovation normally occurs well within the frontier of potentially exploitable knowledge.

Contemporary Insights into the Development Process

Apart from Marx and Schumpeter, the literature on economic growth for most of the nineteenth and early twentieth centuries was rather thin. One of the problems of earlier analysts of capitalist development is that they had to work without the benefit of the modern statistical revolution, which owes so much to the intellectual efforts of Simon Kuznets who developed the analytic framework of national accounts, and encouraged scholars in other countries to produce historical estimates of the major magnitudes. We are now, therefore, much better placed to see when the critical changes in the magnitude of economic growth took place than were earlier writers, using partial indicators such as industrial production or prices, or simply relying on imaginative hypothesis or metaphor. Thanks to pioneers like Colin Clark and Simon Kuznets, we now have an adequate conceptual basis for measuring aggregate economic activity in a national accounting framework. There are official GDP estimates for all our

countries since 1950, and reasonably authoritative historical estimates back into the nineteenth century for many of them. Though there is obviously still substantial scope for improvement, the international comparability of these estimates has been enhanced not only by the adoption of common definitions but by extensive empirical work to facilitate comparison of levels of performance by adjustment for differences in the purchasing power of currencies. Here we owe a great deal to the work of Milton Gilbert and Irving Kravis.

There has been a resurgence of interest in economic growth and development in the postwar period, in relation to the problems both of advanced capitalist countries and of the poorer 'developing' countries.

The literature on the advanced countries has been largely technocratic, concerned with models and production functions, without the socio-historic sweep of the Smith-Marx-Schumpeter tradition. Within this literature there have been two important new ideas which have added to the possibility of analysing capitalist development. These are the notions of technical progress being 'embodied' in the capital stock, and of education as a form of 'human capital' embodied in the labour force.

The first of these ideas was presented in its most elaborate form by Salter (22). He takes capital to be the major vehicle of economic growth because it embodies technical progress. This view led him to define the capital stock as an accumulation of successive "vintages" of capital goods, which augment the productive power of investment year by year (whether it be for replacement, widening, or deepening) because of the progress of technique. He makes a distinction between "best practice" productivity and average productivity, which is extremely helpful in identifying the nature of technological leadership, the reasons why other countries lag behind the productivity leader, and why follower countries can achieve faster growth than the leader. Salter made a sharp distinction between the contribution to growth of economies of scale and those of technical progress, the former being much less important than the latter. When Salter 'explains' economic growth performance, he does it in terms of labour productivity rather than of total factor productivity, as some later analysts in this tradition have done. My own approach to explaining growth has been strongly influenced by Salter, as is clear in Chapters 3 and 5 below.

Another significant development was the dramatisation of the significance of education in economic growth when Schultz introduced the concept of "human capital" (23). This had been adumbrated by Adam Smith, but neglected by Ricardo, Marx, and Schumpeter, who tended to treat all labour as homogeneous. However, the specific identification of the role of education in economic performance is very difficult; and some of the early enthusiasm of human capital pundits who explained wage differentials largely in terms of education, and sought to use the theory to give direct guidelines for educational policy, has met various kinds of scepticism and challenge from authors who think that differences in intelligence, social origin, luck, or credentials have a bigger influence on earnings (24).

Denison is the most ambitious and successful of the modern analysts who have used production functions to throw light on the relative importance of factors contributing to growth (25). He does this by giving weights to the items that figure in our Table 1, which he derives from the share that each factor has in national product as measured in the national accounts. For each factor, e.g. land, labour, capital, he used indicators similar to those in our Appendices, except that he disaggregates more. He adjusts labour input for differences in age, sex, and education (*à la* Schultz), but he does not adjust capital stock (*à la* Salter). He makes allowance for gains owing to economies of scale, sectoral shifts in production structure, international specialization, and disembodied technical progress. He ends up with a measure of 'total factor productivity' and an unexplained residual.

All quantitative analysts of economic growth are greatly indebted to Denison, who has shown great ingenuity and sophistication in providing indications of the potential order of magnitude of particular influences on growth, and has demonstrated that respect for national accounting and its logic does not

preclude intelligent guesswork. The rigour of his analysis, the meticulous detail of his research and his analytical mastery have done a great deal to spark off further useful work in this field (26).

Another major stream of postwar thought that is relevant to our interests is 'development economics', which deals with the growth problems of poor countries.

Four main types of explanation for the lower income and productivity of "developing" countries emerge from this literature: (a) the institutional setting was or is less favourable to capitalist development than that of Western Europe and its offshoots; (b) various kinds of colonialism retarded development; (c) demographic growth has been much greater than was ever the case in the advanced capitalist countries, and this has diverted savings into capital-widening rather than capital-deepening; (d) their levels of investment in human and physical capital are very much lower than in the advanced countries.

As this study is concerned with advanced capitalist nations rather than with poor ones, it is not possible to analyse here the reasons for the divergent experience of rich, middle income, and poor countries. The per capita income range of our sixteen advanced countries is now quite narrow, with the worst-off having an income level only one third below that of the lead country—the USA. "Developing" countries fall well outside this range. The poorest of them have an income only a fortieth of that in the USA.

The Role of Policy and Circumstance

Economic performance is often portrayed as an autonomous process, but in fact it is influenced by institutions and policy to a much greater degree than Marx and Schumpeter ever admitted. Marx obviously felt that some institutional changes in property relations were necessary to launch the capitalist process, but that thereafter government policy played no directly sustaining economic role in his schema. Schumpeter expected capitalism to collapse in part because of perverse policy (e.g. anti-trust action), but generally considered government policy to be impotent. Adam Smith discussed policy and institutions in detail, but was mainly concerned with getting the institutions right and removing perverse policies, so that the economy could function according to market forces, which would promote a natural harmony of interests. Ricardo discussed monetary and foreign exchange policy, but his main prescriptive message was in favour of tariff reduction on food imports in order to cheapen the cost of labour and postpone the day when diminishing returns in agriculture would set in and grind the growth process to a halt by squeezing profits. He expected innovation to produce recurrent bouts of technological unemployment, but he rejected the notion that the level of aggregate demand might be inadequate to secure full use of resources.

It was not until after the 1929-33 depression that a problem of macroeconomic demand management was generally recognized to exist. The inevitability of recurrent unemployment during business cycles had previously been accepted even by analysts like William Beveridge, whose early book on unemployment made policy proposals to deal with frictional rather than cyclical problems. Even the catastrophic events of 1929-33 left Schumpeter unmoved. He regarded the depression as a process of creative destruction.

J.M. Keynes (1883-1946) was the economist who did most to dramatize the case for economic management - both domestically, in promoting full employment through fiscal activism, and internationally, by creating institutions to provide for crisis management and a workable international monetary system. Keynes's contribution was important both for his theoretical work, and because of his unique powers of persuasion. As a rich and successful speculator, bureaucrat, negotiator, statesman, patron of the arts, teacher, journalist, lobbyist, and newspaper proprietor, his ideas impregnated academic and government circles in the UK and USA and had a tremendous influence on postwar judgements on the role of policy.

In fact, the central concern of Keynes was not with economic growth or with factors determining

potential output in the long term: he was concerned with removing the gap between performance and potential by eliminating involuntary unemployment. It was clear in the interwar period that these gaps can be very large indeed.

In the 1950s and 60s Keynesian-type demand management achieved a great deal more than was expected. Not only was unemployment reduced to residual levels in the European countries and Japan, but the experience of rapid growth and euphoric expectations raised investment rates to unprecedented dimensions. These unexpected results were helped by the fact that these countries had an unusually large productivity backlog *vis-a-vis* the USA.

In the 1970s there were major changes in the problems facing economic policy. The international monetary system set up after the war collapsed rather messily between 1971 and 1973; the OPEC countries used their bargaining power to force up the price of energy to an extent that caused major problems of inflation, balance of payments, and structural adjustment; and a variety of other forces contributed to produce rates of inflation hitherto unknown in peacetime. This led governments to change their policy objectives. The full employment goal was dropped, and policy concentrated on efforts to dampen inflation. These have been largely successful but the change in the “establishment view” of policy tasks which occurred in the 1970s and early 1980s has proved to be rather fundamental and is more cautious than the Keynesian-type activism of the Golden Age.

Finally, one must note the influence of non-economic events on performance. Economists generally favour self-contained and systematic explanations of growth and do not like to give “exogenous” events a major role. Some historians, by contrast, describe economic development as a chain of *ad hoc* events happening more or less by accident. Schumpeter probably came closest to building a schema in which unexplained events play a major role, but he postulated a rhythm in these events. The present approach is eclectic. It offers a schema (on the lines of Table 1) to explain why capitalist performance is superior to that of earlier economic epochs; but major changes in the rhythm of development are explained largely in terms of exogenous shocks and variations in the effectiveness of economic policy in coping with new circumstances, new social pressures, or new balances of international power. This is clear in Chapter 4 below, which rejects the idea of a general schema explaining variations in the pace of development within the capitalist epoch.

Notes

- 1) For a critical appraisal of these, see E. Hobsbawm, *Karl Marx: Pre-Capitalist Economic Formations*, Lawrence and Wishart, London, 1964. For a critique of non-Marxist growth 'stages', see B.F. Hoselitz (ed.), *Theories of Economic Growth*, Free Press, New York, 1960. W.W. Rostow, *The Stages of Economic Growth*, Cambridge, 1962, is discussed in Chapter 4 below.
- 2) See E.H. Phelps Brown and S.V. Hopkins, "Seven Centuries of the Prices of Consumables, Compared with Builders' Wage-rates", *Economica*, November 1956, p. 32 for evidence of fluctuations in real wages for a limited group of workers in southern England from 1264 to 1954. These Phelps Brown fluctuations are sometimes cited as if they were likely to have been characteristic of living standard fluctuations for the economy as a whole, but they are much too big to make this even remotely probable.
- 3) See S. Kuznets, *Population, Capital and Growth*, Heinemann, London, 1974, pp. 139 and 167 suggests a growth rate of 0.2 per cent a year for per capita income in Europe from 1500 to 1750. D.S. Landes, *The Unbound Prometheus*, Cambridge, 1969, p. 14, suggests that from the year 1000 to the eighteenth century European real income per head may have tripled. C.M. Cipolla, *Before the Industrial Revolution: European Society and Economy, 1000-1700*, Norton, New York, 1976 also suggests a slow but rising long run trend.
- 4) T.R. Malthus, *First Essay on Population 1798*, Macmillan, London, 1966, p. 139.

- 5) See P. Laslett, *The World We Have Lost*, Methuen, London, 1973, Chapters 4 and 5. Laslett also describes the work of the Cambridge Group for the History of Population and Social Structure, which has been strongly influenced by Louis Henry of the Institut National d'Etudes Demographiques in Paris, and French historical demographers of the Annales school.
- 6) See G.E. Barnett (ed.), *Two Tracts by Gregory King*, Johns Hopkins, Baltimore, 1936, p. 31.
- 7) See E. Boserup, *The Conditions of Agricultural Growth*, Allen and Unwin, London, 1965, for a major contribution to anti-Malthusian analysis.
- 8) See L. White, *Medieval Technology and Social Change*, Oxford, 1962; B.H. Slicher van Bath, *The Agrarian History of Western Europe AD 500-1850*, Edward Arnold, London, 1963.
- 9) See E. LeRoy Ladurie, *Les paysans de Languedoc*, Mouton, Paris, 1966.
- 10) "Les masses profondes: la paysannerie", in F. Braudel and E. Larousse (eds.), *Histoire économique et sociale de la France*, pt. 1, vol. 2, PUF, Paris, 1977.
- 11) See "L'histoire immobile", *Le territoire de l'historien*, vol. II, Gallimard, Paris, 1978, pp. 24-7.
- 12) See also his brilliant reconstruction of thirteenth-century village life, *Montaillou*, Gallimard, Paris, 1978, which shows a well-fed population continuously infested by lice.
- 13) See *Agrarkrisen und Agrarkonjunktur*, Parey, Hamburg, 1978, pp. 285-9.
- 14) See F.P. Braudel and F. Spooner, "Prices in Europe from 1450 to 1750", in E.E. Rich and C.H. Wilson (eds.), *Cambridge Economic History of Europe*, Vol. IV, Cambridge, 1967, p. 429. This article also embraces the idea that European economic life has for several countries been dominated by five types of cyclical rhythm (50-year Kondratieffs, 20-year hypercycles, 15-year Labrousse intercycles, 810-year Juglars, and 40-month Kitchins). Braudel here and elsewhere seems to have derived his eclectic ideas from Gaston Imbert, *Des mouvements à longue durée Kondratieff*, La Pensée Universitaire, Aix-en-Provence, 1959, which presents an exhaustive survey of various Kondratieff-Schumpeter-type views and assembles a good many long-term price series to carry back this type of analysis in time. Braudel is not alone in using these fancy schemas, but a note of skepticism is emerging among French historians. See the criticism of Simiand's monetarist price cycles in M. Morineau, "La conjuncture ou les cernes de la croissance", in Braudel and Larousse, op. cit. Morineau also discusses some of the problems of welding regional data into national estimates and even discusses problems of measuring GNP for 1500-1700.
- 15) See F. Braudel, *Capitalism and Material Life 1400-1800*, Harper and Row, New York, 1973, p x, and F.C. Spooner, *The International Economy and Monetary Movements in France, 1493-1725*, Harvard, 1972.
- 16) J.A. Schumpeter's posthumous *History of Economic Analysis*, Oxford, 1954, is an encyclopaedic and subtle review of economic literature revealing his great detachment and generosity as a critic. Marx also left a much less polished manuscript survey, *Theories of Surplus Value* (3 vols.), Lawrence and Wishart, London, 1969, written in the opposite style with vituperative fervour.
- 17) See P. Sraffa and M.H. Dobb, *The Works and Correspondence of David Ricardo* (10 vols.), Cambridge, 1951. The most succinct presentation of Ricardo's schema is in his 'Essay on Profits', vol. iv, pp. 9-41.
- 18) Marx's vision of 'the laws of motion' of the capitalist epoch is fairly fully stated in Chapters 22-4 of vol. I of *Capital*. His cycle theory and analysis of different types of unemployment is contained in Sections 3 and 4 of Chapter 23. For a critical assessment and reader's guide, see M. Blaug, *Economic Theory in Retrospect*, Heinemann, London, 1968, Chapter 7. See also M. Dobb, *Political Economy and Capitalism*, Routledge & Kegan Paul, London, 1937, Chapter V. My presentation of Marx is rather simplified and stresses elements with which I am largely in agreement, ignoring the labour theory of value and the division of capital into circulating and fixed. The problem in interpreting Marx is that his major published work on capitalist development was supplemented after his death by 4,500 pages of his preparatory or unfinished work on the same topic.
- 19) Here is what he said about the possibility of diminishing returns on land: "Technological progress

effectively turned the tables on any such tendency, and it is one of the safest predictions that in the calculable future we shall live in an *embarras de richesse* of both foodstuffs and raw materials, giving all the rein to expansion of total output that we shall know what to do with. This applies to mineral resources as well.” See J.A. Schumpeter, *Capitalism, Socialism, and Democracy*, Allen and Unwin, London, 1943, p. 116.

- 20) See J.A. Schumpeter, *Imperialism, Social Classes* (ed. B. Hoselitz), Meridian, New York, 1951.
- 21) The above statement of Schumpeter's views is from *The Theory of Economic Development*, Oxford University Press, New York, 1961, which he first published in German in 1911. In later life, he expressed great detachment about the fate of capitalism and stressed that he had not intended to glorify entrepreneurs. In a note to the first English language edition of his book, which appeared in 1934, he even suggested that their economic function could not be distinguished from that of robbers (p. 90). In a later work (see *Business Cycles*, 1939), he described how the entrepreneurial function can be institutionalized in large corporations and also put forward a much more complex cycle theory.
- 22) See W.E.G. Salter, *Productivity and Technical Change*, Cambridge, 1960.
- 23) See T.W. Schultz, 'Investment in Human Capital', *American Economic Review*, March 1961.
- 24) See A. Maddison, 'What is Education For?', *Lloyds Bank Review*, April 1974, for an attempt to classify the different objectives of education and assess the contribution of the human capital school.
- 25) See E.F. Denison and J.P. Poullier, *Why Growth Rates Differ*, Brookings Institution, Washington, 1967, which deals with the situation in nine advanced capitalist countries from 1950 to 1962. He has also written four studies on US growth since 1929, of which the latest is *Trends in American Economic Growth 1929-1982*, Brookings Institution, Washington, 1985, and (with W.K. Chung) *How Japan's Economy Grew So Fast*, Brookings Institution, Washington, 1976. The 1967 study is the one to which I refer here.
- 26) See A. Maddison, "Explaining Economic Growth", *Banca Nazionale del Lavoro Quarterly Review*, September 1972, and A. Maddison, 'Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment', *Journal of Economic Literature*, June 1987, for a survey of the growth accounting literature, and an explanation of why I give a greater weight to capital than Denison does.