GLOBELICS

Working Paper Series

No. 2007-05

ISBN: 978-970-701-963-8

Social inequality, technology and economic growth

By

Chris Freeman[1]

The Global Network for Economics of Learning, Innovation, and Competence Building System

www.globelics.org

[1] **Chris Freeman** is Emeritus Professor at the University of Sussex and a Visiting Professor in the Department of Innovation Studies, UEL. He was formerly Director of the Science Policy Research Unit (SPRU), University of Sussex.

GLOBELICS

Social inequality, technology and economic growth [2]

Chris Freeman

University of Sussex

Abstract

It is a matter of common observation that inequalities have been increasing in almost every part of the world in the 1980s and 1990s, reversing the more egalitarian trends which prevailed in the early post-war period. This chapter seeks to show: 1) that some alternating phases of retrenchment and egalitarian trends have been characteristic of industrial capitalist societies throughout the 19th and 20th centuries and 2) that these long swings of social policy are related to the diffusion of major new technologies in the economic system. Finally, the chapter discusses very briefly a few of the main directions in which social policy should move if the present inegalitarian trends are to be reversed.

---

[2] This paper was edited as a chapter in Flis Henwood, Nod Miller, Peter Senker, and Sally Wyatt (2000), Technology and In/Equality: Questioning the Information Society, Taylor & Francis(Routledge), Chapter 8, pp. 149-171

INTRODUCTION

This chapter is in four parts. The first part introduces the idea of long swings in policies dealing with social inequality over half a century or more. It describes in particular, the role of one ardent social reformer in Britian - Eleanor Rathbone - because of her exceptional importance in the evolution of what became the 'Welfare State'. Reformist policies for social services and redistribution of income seem to alternate with periods of reversal and retrenchment. The second part of the chapter suggests that these long swings in social policy and in income distribution have some connection with long cycles in the economy - the so-called 'Kondratieff waves'. The third part tries to show how and why the trend towards greater inequality emerges when a major new technology is spreading through the economic system. The fourth part shows how this inequality also manifests itself in the wealth and poverty of whole nations, through the uneven development of the world economy. Finally, the conclusions suggest very briefly some ways in which the present trends towards greater inequality with all their dangerous social and political consequences might be reversed.

PART I: LONG SWINGS IN SOCIAL POLICY AND INEQUALITY

Concern with social inequality is a recurrent theme of British political life and indeed of world politics. Ever since the Old Testament prophets, if not earlier, many people have found something morally repulsive about the co-existence of extremes of wealth and poverty, especially when the highest incomes and the largest fortunes were not earned by hard work or by exceptional creativity. This ethical concern has been periodically reinforced by fear and by prudence - the *fear* of rebellions and social unrest and *prudence* in attempting to avert rebellion by timely reforms. Although seldom if ever approaching a truly egalitarian distribution of income and wealth, which was in fact rarely advocated by anyone, except by Bernard Shaw in the 1890s and some of the Levellers in the 1640s, these pressures did lead periodically to a wave of social reforms which mitigated the worst hardships in the lives of the poor and the socially excluded (to use today's fashionable terminology). Even if these reforms were sometimes not sufficient to reverse a general trend towards greater inequality, they did provide some temporary alleviation.

In the 1980s and 1990s it has sometimes seemed that both the ethical concern and even the prudence had disappeared. In Britain and the United States especially, but also in many other European countries, the trend of fiscal policy which had been flowing strongly in favour of progressive taxation since the Second World War, was reversed. After the war, high levels of taxation on high incomes had been widely advocated and accepted as the norm. Moreover, the gap between skilled and unskilled wages was drastically reduced during and after the war. So general was this trend that Williamson and Lindert, the historians of wealth and poverty in the United States committed themselves in 1980 to this generalisation:

> In contrast with the previous periods of wealth levelling, the twentieth century levelling has not been reversed.
>
> (Williamson and Lindert 1980: 33)

Unfortunately for their generalisation, very soon afterwards, of course, it *was* reversed, not only in the United States but world-wide. Even in countries like Sweden, fiscal regimes were modified in a regressive direction and the biggest changes of all came in the former Communist countries, from a rather egalitarian distribution of income to an extremely unequal distribution (and often no income at all for the poorest). This trend has also been strong in countries like China, which have remained nominally Communist, whilst moving towards free market economies. In the UK, the share of the lowest 20 per cent of household disposable incomes fell from 10 per cent in 1979 to 6 per cent in 1992, while the share of the top 20 per cent rose from 35 to 43 per cent (Table 5.19 of *Social Trends* CSO 1995). That was a pretty drastic and rapid change in the space of little more than a decade in the 1980s, brought about mainly by a combination of mass unemployment on the one hand and big tax reductions for the rich on the other. In the 1990s, the reduction in unemployment in the United States and in UK brought about some improvement in the situation but no major redistributive tax changes were brought into effect.

Indeed, the British government set its face firmly against a return to redistributive taxation and embraced the objective of 'reforming' the welfare state. It is not yet clear in what direction all these

reforms might go - which benefits might be reduced and which might be increased and which eliminated entirely. However, the episode of the single mothers did not augur well for those who supposed that a Labour government might move in the direction of the Liberal Government of 1906 or the Labour Government of 1945, both of which introduced reforms which later came to be known collectively as the 'Welfare State'. However, the 1998 and 1999 Budgets did include some measures with mildly redistributive effects, so it is worth recalling some of the main principles of the Welfare State and how they were viewed by its leading advocates in relation to inequality. Questions of gender, of employment and of health were all considered to be fundamental and inter-connected by Sir William Beveridge when his committee drafted their Report in 1941-1942. The emphasis on family allowances must be attributed primarily to Eleanor Rathbone, who had persuaded Beveridge to join her Family Endowment Society, whilst he was Director of the London School of Economics (LSE) in the 1920s and had introduced child allowances for LSE staff from 1925 onwards.

Eleanor Rathbone was one of the most truly independent MPs who ever sat in the House of Commons. The peculiar constituency which she represented from 1929 until her death on January 2nd 1946 - the 'Combined Universities' - favoured her unique reforming zeal and forthright political style. Few MPs have been so devoted to the principle of thorough research as the basis for social reform as Eleanor Rathbone and few have been so determined to follow through the results of that research.

She is best known as the MP who, almost single-handed in the early days, led the campaign for family allowances. In fact, she began this work long before she became an MP. It was in the '1917 Club' in Gerard Street, Soho (so-called after the February Revolution against the Czar of Russia) that she convened the first meeting of the 'Family Endowment Committee'. She had already contributed an article on the subject to the leading academic journal in economics - the *Economic Journal* - and she invited two young economics students, Emile Burns and Elinor Burns, to join her Committee, together with colleagues who had worked with her in her social research and in the campaign for women's suffrage, and a feminist journalist, Mr. HN Brailsford.

They produced a one shilling pamphlet entitled *Equal Pay and the Family: a Proposal for the National Endowment of Motherhood* in 1918, using the example of the allowances paid to the wives of servicemen to reinforce her own argument based on the statistics of poverty and income distribution. She was familiar with these statistics, having worked for many years in the tradition of Charles Booth, with his surveys of poverty in London (1889-1897) making detailed observations and collecting facts on the scale and nature of poverty in Liverpool in the decade before the First World War. This work had demonstrated the peculiar adverse effects of casual labour in the docks, at that time the biggest single source of employment in Liverpool. Her Report (*How the Casual Labourer Lives*) was published in 1909 and was based on an investigation of family budgets collected and tabulated by a small committee (Stocks 1949: 62). She showed the connection between low wages and malnutrition among young children. It was followed by a similar painstaking study on *The Condition of Widows under the Poor Law in Liverpool*, published in 1913.

It was this tradition of thorough social and economic research which made it possible for Eleanor Rathbone and her colleagues to produce such effective arguments for the reforms advocated in the booklet on *National Endowment of Motherhood*. However, Sidney Webb warned her that for any great social reform there was a time lag of about nineteen years between the dawn of an idea and its acceptance by public opinion (Stocks 1949: 86). In the case of family allowances the time lag from this first pamphlet to the Family Allowance Act of 1945 was 27 years. All through this long period it was her main, although certainly not her only preoccupation.

She herself was never a Socialist and was indeed in 1931 briefly committed to the support of the National Government. However, even in that year on September 18th, when the Government proposed a 10 per cent cut in the unemployment benefits, her immediate reaction was to query whether it would not be better to increase taxation on higher incomes or luxury spending. Although she herself came from a wealthy family, her biographer, Mary Stocks comments that she always

> looked sympathetically on proposals which involved the redistribution of wealth through taxation and the elimination of wide discrepancies of material well-being between rich and poor.

(Stocks 1949: 188)

This passion for social justice led her into increasingly bitter conflict with the next Convervative government of the mid-1930s, especially in relation to their treatment of the unemployed and their rejection of her arguments on child nutrition. She used the new findings of medical research on calories and vitamins to support the results of her earlier research on family budgets and cost of living.

It was of course mainly the Second World War which changed the climate of opinion on this and many other social reforms. This was true of the United States as well as Britain, although the New Deal already embraced some more egalitarian policies in the 1930s. Williamson and Lindert (1980), although they emphasise strongly the statistical problems, have no hesitation in characterising the two world wars and the Civil War as periods of significant reduction in inequality. Social justice and social cohesion, neglected or rejected as wishy-washy liberal ideals before the Second World War in Britain, now became an essential element in sustaining civilian morale. Reformers like Keynes and Beveridge were once more invited to participate in the highest levels of policy-making. In June 1941, the British government appointed an inter-departmental Committee under the chairmanship of Sir William Beveridge to report on the whole problem of social insurance and allied services. The famous 'Beveridge Report' appeared in November 1942 and was based on three key assumptions:

1. The acceptance of family allowances
2. A comprehensive health service
3. Full employment.

These were the three foundations of the post-war welfare state. Largely due to the persistent advocacy of Eleanor Rathbone, the first of these principles now proved relatively uncontroversial and the Family Allowance Act went through in 1945. So far, the government elected in Britain in 1997 has continued this tradition with respect to family allowances and child poverty. The 1945 Act was not all that Eleanor Rathbone had campaigned for and she did not live to see the Welfare State flourish in the 1950s and 1960s in Britain and other countries, nor the beginnings of its decline in the 1980s and

1990s. Nor did she witness the widening gap between rich and poor, which has reversed the egalitarian trends of the 1940s and 1950s in Eastern as well as in Western Europe, in North as well as in South America, in China as well as in Japan. If she had seen it, it is unlikely in the extreme that she would have seen any connection between these trends and changes in technology, but that is the theme to which I turn in the second part of this chapter.

PART II: LONG WAVES AND TECHNOLOGY

Probably the most thorough, although certainly still controversial studies of the long-term trends in the distribution of income and ownership of wealth in the United States are those of Williamson and Lindert (1980). They point out that already in the 1830s, in his classic study *Democracy in America*, de Tocqueville (1839), although very impressed by some egalitarian trends in American society, nevertheless suggested that industrialisation could lead to much greater inequality:

> I am of the opinion ..... that the manufacturing aristocracy which is growing up under our eyes is one of the harshest that ever existed ... the friends of democracy should keep their eyes anxiously fixed in this direction, for if a permanent inequality of conditions and aristocracy ..... penetrates into America, it may be predicted that this is the gate by which they will enter.
>
> (de Tocqueville 1963 edition: 16)

This inspired intuitive observation by de Tocqueville became a definitive hypothesis in the classic paper of Simon Kuznets (1955) on Economic Growth and Inequality, in which he suggested that growing inequality was characteristic of economies during the process of industrialisation, while "mature" economies would be characterised by more egalitarian trends.

Williamson and Lindert (1980) argue that both in the United States and Britain the evidence supports the Kuznets hypothesis over the whole period of industrialisation, with growing inequality characteristic of both countries during most of the nineteenth century. In their painstaking research they deal with both the *distribution* of income and the *ownership* of wealth and argue that the two are closely related over the long term. Whilst they emphasise very strongly the poor quality and

unreliability of the data on both incomes and wealth, especially in the period before the 1870s, they nevertheless feel able to make some tentative generalisations. In particular, they argue that the nature and direction of technical change during industrialisation favoured a persistent trend towards greater inequality. They place much greater emphasis on this than on social and fiscal policies but they do not pay much attention to the *specifics* of various waves of technology, nor to business cycles. They identify some periods of temporary reversal of the trend towards greater inequality, but they associate these periods (1800-1820, 1860s, 1910s) primarily with the incidence of wars, with their strong demand for unskilled labour and their tendency to full employment.

Another American economist, Brian Berry (1995), argues on the other hand that there have been other causes of the tendencies towards greater inequality in the United States:

> In the two-hundred year history of American macro-economic development there have been four great surges in inequality. Each followed a stagflation crisis and was accompanied by a turn of the electorate to more conservative commercially-oriented candidates for the Presidency and Congress. Each surge was followed in turn by an egalitarian backlash in which a political agenda dominated by technological innovation, efficiency and growth was replaced by one concerned with social innovation, equality and redistribution.
>
> (Berry et al. 1995: Abstract)

Should these long swings be attributed simply to electoral pendulum-type changes in political mood over successive generations or are they related in some way to changes in the economy and in technology?

At the simplest level, it is of course obvious that the standard of living for all of us depends on the achievements of science and technology. Since Adam Smith's *Wealth of Nations* and Marshall's comments on *Knowledge as the Chief Engine of Production,* the role of technical change in economic growth has been universally accepted by all schools of economists. The so-called "New Growth

Theory" gives to Research, Development and Education a more central role than earlier growth models but no economist of repute had ever denied their importance.

However, it is one thing to pay lip-service to the importance of science and technology in economic and social change but quite another thing to study this interdependent relationship in depth, i.e. to deploy the patient skills which Eleanor Rathbone deployed in her studies of household budgets and apply them to the empirical study of the actual process of technical change in firms, in industries, in nations and in the world economy. In the first half of this century, almost the only economist to attempt this was Joseph Schumpeter and for this reason, research on the economics and sociology of technical change is usually described as "neo-Schumpeterian". Its relevance to the problems of income distribution and social cohesion is especially evident in relation to the long cycles of investment behaviour and unemployment, which he placed at the centre of his theory.

Schumpeter suggested in his *magnum opus* on *Business Cycles* (1939) that waves of new investment were generated by the diffusion of new technologies. In his theory, the ability and initiative of entrepreneurs, drawing upon the discoveries and ideas of scientists and inventors, create entirely new opportunities for investment, growth and employment. The exceptional profits made from these innovations are then the decisive signal to swarms of imitators generating band-wagon and multiplier effects throughout the system. Following the Russian economist, Nikolai Kondratieff, he argued that successive industrial revolutions led to long cycles of about 50 years' duration (Table 1 and Diagram 1). Schumpeter studied the extraordinarily rapid growth of the cotton and iron industries in the first industrial revolution, of steam power and railways in the second and of electrification in the third. He observed that innovations tend to cluster together in relation to new infrastructures, so that the growth of the economy depends on a succession of industrial revolutions.

(Table 1 and Diagram 1 near here)

In a passage which is seldom referred to, Keynes (1930) fully acknowledged the significance of these influences on investment behaviour:

> In the case of fixed capital it is easy to understand why fluctuations should occur in the rate of investment. Entrepreneurs are induced to embark on the production of fixed capital or deterred from doing so by their expectations of the profits to be made. Apart from the many minor reasons why these should fluctuate in a changing world, Professor Schumpeter's explanation of the major movements may be unreservedly accepted. (Keynes, 1930: 134)

The big investment booms and full employment of the 1850s and 1860s, or of the "Belle Epoque" before the First World War, or of the "Golden Age" of the 1950s and 1960s were followed by fairly prolonged periods of recession, depression and high unemployment. In Schumpeter's scheme, these recessions were the result of the erosion of profits from the previous wave of technology and the necessity for a new infrastructure and new industries to unleash the next wave. His theory is still controversial; opposition has come both from more orthodox mainstream economists, who have been preoccupied with the shorter business cycles, and from orthodox Marxists, who drove Kondratieff to an early death in Siberian labour camps in the 1930s.

In the 1920s some American economists and businessmen had assumed that Henry Ford had superseded Karl Marx and that a bull market on the Stock Exchange could continue long into the future. In his *Short History of Financial Euphoria*, Galbraith (1993: 80) points out that just before the Wall Street crash of 1929, Irving Fisher and other American economists believed that stock prices were not over-valued and had reached a permanently high plateau. This neglect of both long and short business cycles was repeated in the 1990s when references were frequently made to the supposed "end of history" and "a new paradigm" of low inflation, full employment and high growth was supposed to have eliminated the business cycle. Alan Greenspan showed some doubts about this but euphoria was widespread in the late 1990s.

If the test of a theory in the social sciences, as in the natural sciences, is its predictive power, then the ideas of Kondratieff and Schumpeter come out of this test in the twentieth century rather well. At a time when more orthodox Marxists were predicting the collapse of capitalism and its final crisis in the 1930s, Kondratieff had pointed to the possibility of a new capitalist growth boom. When the biggest ever boom did in fact materialise in the 1950s and 1960s, long wave theorists such as Mandel,

pointed to the probability of a new deep recession. This was at a time when many economists and government advisors, such as those at the OECD, assumed that the problem of mass unemployment would never return. Even in the 1970s, they continued to believe this despite the mounting evidence of structural unemployment (see, for example, the McCracken Report, OECD 1977). In the 1930s, however, many economists had believed the opposite: that unemployment would remain at a permanently high level. Mainstream economics thus showed a persistent inability to understand or cope with the problems of mass unemployment and of structural change related to new technologies and with the problem of long swings in the world economy, whose very existence was denied.

Those economists and technologists who saw in Computer Technology, Information Technology and the Internet an enormous potential for new employment and a new wave of high investment and high growth were not mistaken. There is indeed such a *potential* but all previous experience shows that when a new pervasive technology enters the economic system, it can do so only after a prolonged social process of learning, reform and adaptation of old institutions. It was Carlota Perez (1983) who pointed out that there would be a mis-match between the institutions created to regulate the previously dominant technology and those needed to regulate a new one. The technical, political and economic uncertainties are so great that an uneven and conflict-ridden process is the rule rather than the exception. Temporary over-capacity in the fastest growing new industries was characteristic of all the big technologies in the past, as in semi-conductors and computers today. There was huge over-capacity in the Detroit automobile industry in the 1930s, and in the British cotton industry in the 1830s. No-one can predict accurately at the time what will be the future size and characteristics of such new markets, still less the share of the individual firms or countries. These uncertainties are compounded by waves of euphoria and panic in the financial markets and by the general instability of investment in a capitalist market economy. The Internet Bubble was no exception to this general rule as the *Economist* magazine has forcefully printed out on several occasions (*Economist*, 25th September 1999).

III: GROWING INEQUALITY IN PERIODS OF STRUCTURAL ADJUSTMENT

Unemployment in periods of deep structural change is itself one of the main sources of inequality. These periods have been well described as "crises of structural adjustment" because there is a mis-match between the skills and institutions of the older technologies and those which are needed for the new wave of technologies. Shortages and surpluses exist side by side as in the case of the shortage of software designers and engineers which persisted ever since the 1970s right through a period of massive unemployment. It was for this reason that Schumpeter maintained that aggregate statistics of GNP or of industrial production can conceal as much as they reveal since they are the outcome of *diverse* trends in the economy. There is general agreement that *structural* unemployment has been the main problem from the 1970s onwards, especially in Europe. However, although it has often been severe, unemployment has not been the only source of growing inequality over the last twenty years. Changes in *earnings* have also been a very important source of inequality (Table 2).

(Table 2 near here)

As the notion of "information-rich" and "information-poor" households suggests, social inequality is not only a question of employment and unemployment. Each new wave of technical change brings with it many social benefits in the form of new more skilled occupations and professions, and higher standards of living for many people based on the growth of new industries and services. But each wave also brings high social costs in the form of erosion of old skills and occupations, the decline of some older industries, services and industrial areas. This uneven distribution of social costs and benefits occurs also on an international scale with some nations taking full advantage of the new technologies and others unable to do so. This international dimension is discussed in section IV of this chapter.

The effects of this uneven distribution of social costs and benefits are clearly visible in the statistics of earnings for the 1980s (Table 2). Twelve out of seventeen OECD countries showed an increased dispersion of earnings in the 1980s, four showed no change and only one (Germany) showed a decrease. In the 1970s the reverse was true. In that decade only one country showed an increase in inequality - the United States - while most others showed a decrease in dispersion. These statistics are for income *before* tax. Taking into account that, as we have seen, fiscal changes in the UK and

many other countries were regressive in this period, the increase of inequality in incomes has been substantial for those in employment as well as the unemployed.

Similar changes took place in previous waves of technical change: the earnings of engine drivers and fitters in the nineteenth century, of electricians in the 1890s, of assembly line workers in the 1940s and 1950s, and of software engineers and programmers in the 1980s, were all above the average earnings of the time. It is obvious that in any market system, the shortage of workers in rapidly expanding occupations will have these effects because of lags in supply. Consequently, periods of rapid structural change have generally been associated with increased inequality of incomes, arising both from increased dispersion of earnings and from high levels of unemployment.

The Secretary-General of the OECD, M. Paye, described the high levels of unemployment in the early 1990s as "disturbing, perhaps alarming" and in the past the alarm bells which were ringing, whether in the 1830s, the 1880s or 1930s, ultimately led in this country and in others to programmes of social reform, educational reform, employment policies, and fiscal changes designed to mitigate the worst effects of these problems of structural change and to share the burdens more equally.

As we have seen, an American economist, Brian Berry, following in the tradition of Simon Kuznets, had suggested that income dispersion increased in the early stages of industrialisation and economic growth, diminishing with maturity. Berry proposed that *alternating* periods of wider and lesser dispersion corresponded to long (Kondratieff) cycles of economic development. "It is in the immediate post stagflation decade that inequality surges." (Berry 1995: 10). These surges of inequality in the 1830s, the 1880s, the 1920s and the 1980s were associated with the downturn of the long wave, with major structural changes, with demand for new skills (Williamson and Lindert, 1980) and high profits in new industries. The exceptionally high profits from new technologies were obvious in the case of Microsoft in the 1980s and 1990s, of Ford in the 1920s, of Carnegie and the steel industry in the 1880s, of the railway magnate and speculator, George Hudson in the 1840s, or of Arkwright and his water-frame cotton spinning in the 1790s.

Initially, strongly pro-business governments tend to aggravate the growing inequality, believing that a dose of strong medicine is needed to set the economy right, but ultimately according to Berry's analysis, this leads to a political revulsion against the hardships which these policies incur (Jackson and the Homestead Act, etc. in the 1830s, the Anti-Trust Legislation and other reforms in the 1890s, and the New Deal etc., in the 1930s and 1940s).

Similar trends can be detected in social and political history in Britain and other countries as well as the United States. The combined effect of prolonged periods of high unemployment together with the increased dispersion of earnings and increasing regressive taxation has been to create or to enlarge an "underclass" in Britain, Russia, France, Spain and many other countries. A huge underclass already existed in Mexico, Brazil and most other countries of Latin America and Africa and this is growing now in Asia also. A rise in social tensions, crime and ethnic hostility was observable almost everywhere in the 1980s and was clearly associated with the loss of social cohesion and increasing insecurity of employment. The reduction in crime in the United States in the 1990s was not simply due to new methods of policing but also to the temporarily lower levels of unemployment.

IV: THE INTERNATIONAL DIMENSIONS OF INEQUALITY

The international dimension of the growth of inequality is even more serious than the domestic problems in the richer countries since the poverty in the Third World is far more extreme. Since the Industrial Revolution and the huge changes in technology over the past two centuries, variations in country growth rates have been very wide. In particular, a group of countries, today referred to as "developed" or "industrialised" drew far ahead of the rest of the world (later known as "under-developed") (Table 3, Column 3).

(Table 3 near here)

Abramovitz (1986) coined the expression "social capability" to describe that capacity to make institutional changes which led to this divergence in growth rates. He was himself one of the pioneers of "growth accounting" but, as he pointed out, the accumulation of capital and increase in the labour

force are not in themselves sufficient to explain these varying rates of economic growth. The huge divergence in growth rates which is so obvious a feature of long-term economic growth over the past two centuries must be attributed in large measure to the presence or absence of social capability for institutional change, and especially for those types of institutional change which facilitate and stimulate a high rate of technical change, i.e. innovation systems. Institutional changes were, of course, essential for the accumulation of capital itself.

The rise of pervasive new technologies involves the emergence of some *qualitatively* new features in the social and economic system. Partly as a result of historical accidents and partly as a result of deliberate policies, their domination of international institutions and naval power, some countries proved more adept in exploiting the potential of these new technologies both in world trade and in domestic growth. Many other countries were able to catch up with the leaders by a combination of imitation and autonomous innovation. Until the 1990s, some of the East Asian countries were good examples of accelerated catch-up. Both their rapid catch-up in the 1970s and 1980s and the crisis which they experienced in the mid-1990s demand some explanation in terms of technical and institutional change.

Whereas real per capita incomes were actually *falling* over the 1980s in Africa and Latin America, they were rising quite fast in South Asia and very rapidly in East Asia (Tables 4 and 5). The East Asian countries were especially successful in expanding their production and exports of electronics and telecommunication equipment, which were by far the fastest growing in world trade. Although they are all relatively new, the electronic industries vary in their skill intensity and technology intensity. The general pattern is clearly for the most skill- and technology-intensive activities to remain in Japan with the least skill-intensive increasingly based in the second tier of South-East Asian countries or even in South Asia. The 4 Tigers and China occupy an intermediate position but analysis of the trends in their exports shows a steadily rising ratio of skill-intensive and technology-intensive products. This shift was made possible by active education, industrial and technology policies within these countries (Amsden, 1991, 1992; Amsden and Hikino, 1991; Wade, 1990).

(Tables 4 and 5 near here)

What the post-war experience demonstrates therefore is an extremely uneven process of catch-up by developing countries, depending upon their technical capability and on imports of technologies. But the import of technologies is very far from the costless diffusion of "information" assumed in some versions of economic theory. Technologies cannot be taken "off the shelf" and simply put into use anywhere. Without infrastructural investment in education, training, R&D and other scientific and technical activities, very little can be accomplished by way of assimilation of imported technologies. The Asian countries were by far the most active in promoting these policies. Hobday (1995) has pointed to the variety of strategies in the East Asian countries, all designed in different ways steadily to upgrade local technological capability. The contrast between the rapid rise in the performance of in-house R&D in *firms* in both S. Korea and Taiwan, and its low level, stagnation or non-existence in firms in most developing countries is especially notable.

The rise of in-house R&D in the 1970s led to an extraordinary increase in numbers of patents and this is perhaps the most striking confirmation of the *active* learning system in S. Korea and Taiwan. Between 1963-1985 and 1997-1998, the average number of patents taken out per annum in the USA by Brazil, Argentina and Mexico together increased from 94 p.a. to 163 p.a., but in the same period, the numbers taken out by the three Asian "Tigers" increased from 36 p.a. to over 5,000 p.a. (Table 6). The figures for 1997-98 were not yet affected by the downturn in the Asian economies in that period because of the lag in the patent series based on *grant* of patent in the US Patent Office.

(Table 6 near here)

Firms in both Korea and Taiwan were so successful in their catch-up that they began to export technology themselves and to invest overseas in older industrial countries like Britain as well as in the less developed countries of South-East Asia. However, despite their great success in the 1970s and 1980s and indeed, partly because of it, the global economy in the 1990s presented new and acute problems for those catch-up countries which made good progress in closing the gap in manufacturing. The liberalisation of capital movements which had taken place exposed all countries to the instability and shocks which occur in any part of the system. Events during 1997 and 1998

showed that these shocks can be propagated throughout the system and that however well the national economy is performing, it is always still part of a broader global economic and political system.

Many of the comments on the East Asian crisis of 1997-98 are characterised by emphasis on the supposed sins of the Asian governments. In particular, they have blamed corruption of governments for some of the unwise and inept investment decisions of the 1990s. Of course, there has been corruption in many Asian countries and in some, especially Indonesia, it has been on a very large scale. There has also been corruption in European countries and in the United States. But it is fanciful to put the whole blame for the collapse on corruption and to ignore the misallocation of private investment.

As Jeffrey Sachs (1997) has put it:

> It is somehow comforting, as in a good morality tale, to blame corruption and mismanagement in Asia for the crisis. Yes, these exist, and they weaken economic life. But the crisis itself is more pedestrian. No economy can easily weather a panicked withdrawal of confidence, especially if the money was flooding in just months before ....

and further:

> The problems emerged in the private sector. In all of the countries, international money-market managers and investment banks went on a lending binge from 1993 to 1996. To a varying extent in all of the countries, the short-term borrowing from abroad was used, unwisely, to support longterm investments in real estate and other non-exporting sectors.

The problems of catch-up in technology will now be aggravated by the social tensions engendered by the investment crisis and the IMF medicine. In a region previously characterised by rather high levels of employment and a strong demand for labour, unemployment became a serious social problem. The President of the World Bank, James Wolfensohn, was one of the first to recognise that the social

problems associated with high unemployment would now require major policy attention, including World Bank programmes:

> The region must tackle social issues if it is to foster sustainable economic recovery and East Asia's financial crisis risks undermining one of the most remarkable economic and social achievements of modern history. What began as a financial crisis has spilled over into the real economy, severely hitting both production and employment.
> In that case, was the miracle a mirage? Emphatically not. No other group of countries in the world has produced more rapid economic growth and dramatic reductions in poverty.
>
> ..... They did it by getting the fundamentals right - with high savings, a commitment to education, sound fiscal policies and an outward orientation.
> But as the crisis has revealed, political, financial and corporate structures were not well suited to cope with the demands of an increasingly globalised economy.
>
> (Quote from *Financial Times*, 29 January 1998)

As recent events have shown, dependence on the global economy, and on the IMF and World Bank, can be a mixed blessing so that the reform of the IMF is now becoming an urgent question for the management of the global economy. Again, as Jeffrey Sachs (1998) has pointed out, the lack of accountability and transparency in the operations of the IMF means that disagreement with its advice is now often regarded as synonymous with a sinful rejection of financial rectitude punishable by the markets. Yet its advice has often been mistaken and not only in East Asia. It forecast growth of 1.5 per cent in Mexico in 1995 after the Mexican financial crisis, but actual growth was minus 6.1 per cent and again in Argentina forecast growth was 2 per cent and actual growth minus 4.6 per cent. Its handling of successive crises in Latin America in 1995, in Bulgaria in 1996 and East Asia in 1997 and 1998 calls into question its ability to handle the volatility of the private capital market in a way which does not damage future growth in countries in which the "fundamentals" for sustained growth are relatively favourable.

V: CONCLUSIONS

Cycles of over-capacity and of shortages are a familiar accompaniment of waves of technical change. The over-capacity in Asia in electronic consumer goods was one such episode and the over-capacity in memory chips and semi-conductors was another; the Bank for International Settlements pointed to these problems in successive Annual Reports: 'indications of excessive investment in particular sectors had already emerged in 1996. In that year, the massive investment in Asia's electronic industry contributed to conditions of oversupply and a resulting price collapse in world markets. But investment has sharply increased in other areas as well (such as automobile construction, household appliances and electricity generation) at the risk of flooding local and foreign markets ..... Overinvestment in particular sectors has tended to erode the rates of return on capital in recent years.' (Kaplinsky, 1998).

These phenomena in the "real" economy interact with political events and with financial markets to generate the instability characteristic of the periods of structural "crises of adjustment". In the 1890s as in the 1990s, outward flows of speculative investment to "emerging economies" aggravated this instability. The headlong de-regulation and liberalisation of capital movements in the 1970s and 1980s has created a particularly unstable situation in the world economy at the turn of the millennium, as both the speed and scale of capital movements are greatly increased by the use of information technology and of ingenious financial innovations such as derivatives. The mathematical pretensions of the derivatives models which underlie the speculative investments of the "hedging funds", even if they are developed by Nobel prize-winners, would be laughable if they were not tragic in their consequences.

The present phase of the "information revolution" therefore calls out more than ever for institutional and social innovations which could create a stable regulatory framework for the constructive application of this extraordinary powerful technology in world-wide economic growth. Another "belle époque" in which the potential productivity gains of information technology are more fully realised is by no means inevitable. It depends on the policies which are now adopted.

It is not possible here to prescribe a detailed set of policy proposals but what can be done in conclusion is to indicate the main directions in which future policies should move, first of all to mitigate the worst effects of the present crisis and later, to shape a more stable social environment for the world economy.

Firstly, as many economists and politicians have now recognised, the IMF and World Bank should be reformed to bring them closer to the original Keynesian ideal. They need the resources and the mode of governance to enable them to prevent temporary problems of particular countries from degenerating into general deflationary recessions.

Secondly, as the President of the World Bank, James Wolfensohn, has indicated *social* policies should assume a much higher priority. The general trend of these policies should be designed to reduce inequalities in the system, both at the national and the international level. World-wide redistributive policies should be financed by the "Tobin Tax", a tax on the speculative transactions in international financial markets, first proposed by James Tobin. This would not only provide much-needed additional finance for international institutions but would also help to reduce the huge surges of short-term capital movements which destabilise governments and societies.

Thirdly, these movements should in any case be far more closely regulated and controlled, as for example, by the tax on short-term capital transactions imposed in Chile.

Finally, the trend towards inegalitarian taxation and social policies should be reversed by a return to the principles of redistribution, as advocated by most leading economists since John Stuart Mill and as so energetically pursued by idealistic social reformers, such as Eleanor Rathbone and John Stuart Mill himself. Movements in these directions might seem a distant and even Utopian ideal in the immediate future but in the light of the long-term changes discussed in this chapter, they may not be so remote and may be already important early in the twenty-first century.

References

Abramovitz, M.A. (1986) 'Catching up, forging ahead and falling behind', *Journal of Economic History*, 46: 385-406

Amsden, A.H. (1991) 'Diffusion of development; the late industrialising model and Greater East Asia', *American Economic Review*, 81, 2: 282-286

-- (1992) 'A Theory of Government Interaction in late industrialisation' in L. Putterman and D. Rueschmeyer (eds), *The State and Market in Development*, New York: Lynn Riener.

Amsden, A. and Hikino, T. (1991) 'Borrowing technology or innovating: an exploration of two paths to industrial development'. Working Paper no. 31, New School for Social Research, New York.

Bairoch, P. (1981) 'The main trends in national economic disparities since the industrial revolution', in P. Bairoch and M. Levy-Loboyen, *Disparities in Economic Development since the Industrial Revolution*, London: Macmillan

Berry, B.J.L, Harpham, E.J and Elliott, E. (1995) 'Long Swings in American Inequality, the Kuznets conjecture revisited', *Papers In Regional Science*, 74, 2: 153-174

Galbraith, J.K (1993) *A Short History of Financial Euphoria,* Harmondsworth: Penguin.

Hobday, M. (1995) *Innovation in East Asia: the challenge to Japan,* Aldershot: Elgar

Kaplinsky, R. (1998) Bank for International Settlements, 68th Annual Report: 36

Keynes, J.M. (1930) *A Treatise on Money*, London: Macmillan.

Kuznets, S. (1955) 'Economic Growth and Income Inequality', *American Economic Review,* 45, 1: 1-28.

OECD (McCracken Report), (1977) *Towards Full Employment and Price Stability*, Paris: OECD.

-- (1993) *Employment Outlook*, Paris: OECD.

Perez, C. (1983) 'Structural change and the assimilation of new technologies in the economic and social system', *Futures* 15, 5: 357-375.

Sachs, J.D. (1997) IMF orthodoxy isn't what Southeast Asia needs, *International Herald Tribune,* 4 November.

-- (1998) 'Out of the Frying Pan into the IMF Fire', *Observer*, 8 February.

Schumpeter, J.A. (1939) *Business Cycles* (2 Vols.), New York: McGraw Hill.

Social Trends, (1995) London: CSO.

Stocks, M. (1949) *Eleanor Rathbone, a Biography*, London: Gollancz

Wade, R. (1990) *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialisation,* Princeton: Princeton University Press.

Williamson, J.G. and Lindert, P.H. (1980) *American Inequality: a Macro-economic History*, New York: Academic Press.

Wolfensohn, J. (1998) Asia, the long view, *Financial Times,* 29 January.

World Bank (1991) *World Development Report, 1991*, New York: Oxford University Press

Table 1 **LONG WAVES**

Kondratieff Wave	Cycle	Recession Trough of Depression	Core Inputs	Carrier Branches	Infrastructures
1st	1780s-1840s	1820s 1830s 1842-43	COTTON YARN IRON	Cotton Textiles Other textiles Iron products	Ports Canals Water Power Turnpike Roads
2nd	1840s-1890s	1870s 1880s 1890s	COAL COAL GAS	Steam Engines Railways Mechanisation Gas Machine Tools	Iron - Rail Networks Telegraphy Steam Ships Gas Light & Heat
3rd	1890s-1940s	1920s 1930s 1930-34	STEEL	Electrification Electrical and Heavy Engineering Heavy Chemicals Non-Ferrous Metals	Electric Power Steel Ships Global Steel Rail Networks Telephones

4th	**1940s-1990s**	**1970s** **1980s** **1990s**	**OIL** **NATURAL GAS**	**Automobiles** **Consumer Durables** **Refineries** **Synthetic Materials** **Automation**	**Motor Highways** **Airlines** **Tankers** **Roll-on, Roll-off**
5th	**1990s?- ?**	**?**	**MICRO-ELECTRONICS**	**Computers** **Video, Telephone Equipment** **Software, Info Services**	**"Information Highways"** **E-Mail** **Air Freight**

Table 5 Distribution of developing countries by rates of growth of GDP per capita 1960-84 (number of countries)

Growth of GDP/Capita	**1960-69**	**1970-74**	**1975-79**	**1980-84**
2 per cent and above				
Latin America	19	17	15	1
Sub-Saharan Africa	25	18	16	5
South Asia	2	1	5	4
East Asia	7	9	7	6
0.1-1.9 per cent				
Latin America	5	8	6	1
Sub-Saharan Africa	10	13	6	7
South Asia	3	1	2	3
East Asia	3	-	-	1
0 per cent and below				
Latin America	2	1	5	24
Sub-Saharan Africa	12	16	25	35

South Asia	2	5	-	-
East Asia	-	1	3	3

Source: UNCTAD (1986) *Trade and Development Report, 1986* New York: United Nations

Table 2 General Pattern of Changes in the Dispersion of Earnings in the 1970s and 1980s
Hourly earnings or earnings of fulltime workers

	1970s	1980s	Comments on extent and type of changes in dispersion
Australia	-	+	Increase in the dispersion from 1979 onwards
Austria	-	+	Increase from 1980 to 1989
Belgium		+	Slight increase due to gains at top over 1983-88
Canada	0	+	Increase mainly due to gains at top
Denmark		0	Slight gains at top and bottom
Finland	-	0	Slight gains at top and bottom
France	-	-/+	Decrease in dispersion ended in 1983
Germany	0	-	Decrease mainly due to gains at bottom
Italy	-	0	Gains at top and bottom
Japan		+	Increase due to gains at top
Netherlands	0	-/+	Slight decrease to 1984, then slight increase
Norway		0	Gains at top and bottom
Portugal		+	Increase between 1985 and 1990
Spain	--/0	+	Sharp decrease in mid-1970s, rise in 1980s
Sweden	0	0/+	Increase after 1986, except for low-paid women
United Kingdom	-	++	Increase from 1979 onwards
United States	+	++	Increase for men only in 1970s; strong gains at top in 1980s

Key: + Increase in dispersion
++ Strong increase
- Decrease

--	Strong decrease
0	No clear change (perhaps changes at top and bottom working in opposite directions)
+/-	Increase followed by decrease (etc.)
Blank	No information available

Source: OECD (1993), *Employment Outlook*

Table 4
Comparative Growth Rates
Sub-continental Regions
1965 - 1999

GDP % p.a.	**1965 - 1980**	**1980 - 1989**	**1990-1999 (est)**
East Asia	7.5	7.9	7.2
South Asia	3.9	5.1	5.5
Africa (sub-Sahara)	4.0	2.1	2.7
Latin America	5.8	1.6	3.1

GDP per Capita % p.a.	**1965 - 1980**	**1980 - 1989**	**1990-1999 (est)**
East Asia	5.0	6.3	5.7
South Asia	1.5	2.9	3.4
Africa (sub-Sahara)	1.1	-1.2	0.2
Latin America	3.5	-0.5	1.2

Source: World Bank Development Report, 1991;
Own estimates 1990s

Table 3

Estimates of Trends in Per Capita GNP (1960 US$ and Prices, 1750-1977)

Year	Developed countries	Third World	Gaps
	(1) Per capita	(2) Per capita	(3) Ratio of the most developed to the least developed
1750	182	188	1.8
1800	198	188	1.8
1860	324	174	4.5
1913	662	192	10.4

1950	**1054**	**203**	**17.9**
1970	**2229**	**380**	**25.7**

Source: Bairoch, 1981, pp 7-8

Table 6 Patents granted in the United States to owners in various countries, average numbers per annum in various periods 1963-1998

Country	1963-1985	1983-1989	1990-1996	1997-1998
Taiwan	26	327	1,577	2,578
S. Korea	8	83	853	2,575
Singapore	2	9	48	107
Mexico	54	41	45	51
Brazil	18	30	59	68
Argentina	22	19	28	44
Total all countries	64,391	80,820	110,418	129,752

Source: Kumar (1997) based on data from US Patents and Trademarks Office (1997) for Columns 2 and 3;
TAF Report from US Patent Office (1999) for Columns 1 and 4.