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PRODUCTIVITY AND TECHNOLOGY - THE EMPLOYMENT DIMENSION

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by

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INTRODUCTION

In an EEC survey conducted in October 1983, unemployment was rated as the greatest problem in each of the ten member countries. (Table 1). This is hardly surprising given, not only the high level of unemployment, but also its intractable nature. The latter point is illustrated by the fact that, despite the current recovery in economic activity, the recent OECD (1984) *Employment Outlook* forecasts that there is unlikely to be an early fall in unemployment outside the United States. In Europe, unemployment is expected to rise further from its current level of over 18 million to nearly 20 million by the end of 1985.

High unemployment has traditionally created a suspicious, or even hostile, attitude to technological progress and productivity growth - the subjects of this conference. It is undeniable that if productivity growth in any activity exceeds the growth of output, then labour shedding in one form or another must, by definition, be taking place. And if that situation were to prevail over the aggregate of all activities, then clearly there could be major problems in providing work for all.

Having noted this point, however, one must hasten to add that the spread of hostile attitudes to technological advance and productivity growth would be a most retrograde development. Technology and productivity are a necessary basis for increasing material living standards.

Table 1
 PROBLEMS RANKED BY THEIR ORDER OF IMPORTANCE¹
 (October 1983)

BELGIUM	DENMARK	GERMANY	FRANCE	IRELAND
Unemployment 3.68	Unemployment 3.83	Unemployment 3.77	Unemployment 3.77	Unemployment 3.86
Terrorism 3.41	Environment 3.79	Environment 3.63	Terrorism 3.58	Terrorism 3.56
Energy 3.39	Terrorism 3.78	Energy 3.40	Environment 3.45	Energy 3.47
Environment 3.38	Energy 3.73	Terrorism 3.36	Superpowers 3.37	Rich/poor 3.31
Rich/poor 3.34	Superpowers 3.33	Superpowers 3.21	Energy 3.36	Environment 3.25
Superpowers 3.14	Third World 3.11	Rich/poor 3.11	Rich/poor 3.24	Regions 3.05
Regions 3.03	Rich/poor 3.03	Regions 2.97	Regions 3.06	Superpowers 2.86
Third World 2.78	Regions 2.90	Third World 2.89	Third World 2.89	Third World 2.68
Defence 2.66	Defence 2.65	Defence 2.60	Defence 2.81	Defence 2.67
Average 3.20	Average 3.35	Average 3.22	Average 3.28	Average 3.19
ITALY	LUXEMBOURG	NETHERLANDS	UNITED KINGDOM	GREECE
Unemployment 3.82	Unemployment 3.64	Unemployment 3.74	Unemployment 3.76	Unemployment 3.79
Terrorism 3.72	Environment 3.64	Environment 3.46	Terrorism 3.66	Environment 3.68
Environment 3.56	Energy 3.46	Terrorism 3.42	Energy 3.53	Superpowers 3.53
Energy 3.35	Rich/poor 3.23	Energy 3.24	Environment 3.41	Terrorism 3.50
Rich/poor 3.33	Terrorism 3.22	Rich/poor 3.18	Superpowers 3.37	Rich/poor 3.44
Superpowers 3.28	Third World 2.98	Superpowers 2.99	Defence 3.15	Energy 3.41
Regions 3.13	Regions 2.93	Third World 2.90	Regions 3.05	Defence 3.39
Third World 2.87	Superpowers 2.84	Regions 2.80	Rich/poor 2.95	Regions 3.30
Defence 2.44	Defence 1.94	Defence 2.49	Third World 2.73	Third World 2.84
Average 3.28	Average 3.10	Average 3.14	Average 3.29	Average 3.43

1. Average score: "very important" = 4; "not important at all" = 1.

Differences of less than about .13 between the scores are not significant.

Source: *Euro-barometre*, December 20, 1983, quoted from European Centre for Work and Society, *News*, Issue 5, September 1984.

The challenge to society, therefore, is how to harness technology and productivity so as to secure the benefits of high living standards without incurring the corrosive effects of mass unemployment. This raises important questions relating to economic progress, and the equitable sharing of the fruits of that progress. It is with these issues that I shall be concerned in this paper.

SOURCES OF WORLDWIDE UNEMPLOYMENT

Let us first consider whether technology has been responsible for the great rise in unemployment that has been witnessed in most OECD countries since about the early 1970s. In fact, what we find is that productivity growth has fallen sharply in most OECD countries since 1973. This is true whether we consider productivity in the economy as a whole (Table 2) or in the manufacturing sector (Table 3).

This evidence does not rule out the possibility that the pace of technological change may have accelerated. But it does show that, even if that were true, nevertheless technological change has *not* been the chief factor accounting for the emergence of labour surpluses. If it were, then we should expect to find that productivity growth had accelerated, whereas in fact the opposite has been the case.

The deceleration in productivity growth in the 1970s has spawned a considerable economic literature seeking to account for it. While many explanations have been advanced, there is not as yet a clear consensus as to the relative importance of the different possible causes. There would be wide acceptance of the view, however, that the largest influence was the two major oil shocks and their repercussions. These shocks presented the Western world with a most unpleasant combination: they lowered real incomes, worsened the balance of payments, and had inflationary effects on price but deflationary effects on demand.

Table 2

Annual Growth Rate of Real Gross Domestic Product per Person Employed, Ireland and Twelve Other Nations, Three Periods

	1961-68 %	1968-73 %	1973-79 %
Canada	2.72	2.68	0.48
United States	2.58	1.48	0.36
Belgium	3.91	4.42	2.39
Denmark	3.36	3.12	1.35
France	4.68	4.68	2.83
West Germany	4.08	4.19	3.11
Italy	6.02	4.78	1.60
Netherlands	3.95	4.68	2.29
Norway	3.79	2.13	2.71
Sweden	3.66	2.83	0.61
United Kingdom	2.81	3.05	1.28
Japan	8.40	7.46	2.90
Simple Average	4.16	3.80	1.83
Ireland	3.57	4.04	2.81

Source: Scherer (1984). Irish data based on National Income and Expenditure 1982 and Conniffe and Kennedy (1984).

Table 3

Annual Growth Rate per Hour of Employment in
Manufacturing, Ireland and 12 Other Nations, 1960-73 vs. 1973-82

	1960-73 %	1973-82 %
Canada	4.5	1.6
United States	3.0	1.7
Belgium	7.0	6.0
Denmark	6.4	4.1
France	6.7	4.5
West Germany	5.7	3.6
Italy	6.9	3.7
Netherlands	7.6	4.8
Norway	4.5	2.0
Sweden	6.6	2.2
United Kingdom	4.4	1.8
Japan	10.7	7.2
Simple Average	6.2	3.6
Ireland	4.9	5.4
do. excluding office and data processing machinery		4.2

Source: Scherer (1984) and CSO Industrial Inquiries. The Irish data relate to the two decades 1963-73 and 1973-83.

The initial policy reaction in many countries was to give precedence to maintaining employment by countering the demand deflationary impact - in which task they had only partial success.. But following the second major oil price increase towards the end of 1979, the governments of the major economies were determined to use fiscal and monetary policy to resist the price inflationary consequences - even though such action intensified the demand deflationary impact of the oil price increase.

The outcome of these shocks and policy responses has been a sharply reduced growth in output since 1973 compared with the preceding two decades. This has lowered both employment growth and productivity growth. Furthermore, at the micro level, the large rise in the real price of oil and other energy accelerated the obsolescence of energy-intensive capital equipment in a wide range of activities.

But why are countries still unwilling to adopt the traditional Keynesian remedy of reflating demand so as to restore rapid expansion of output, employment and productivity? Apart from the fact that many governments are ideologically opposed to such a course, there are a number of genuine concerns that face any government contemplating such action. *First*, there is an overhang of large budgetary deficits in many countries, which understandably makes governments cautious about adding further to public borrowing. *Second*, there are fears that price inflationary forces, while dampened, are by no means dead. *Third*, arising from the development of international transport and communications, as well as the considerable freeing of trade in the post-War period, countries have become much more interdependent. Even quite large countries, therefore, find it difficult to sustain

a go-it-alone policy in regard to demand expansion - as was shown all too clearly in the abortive attempt by the French socialist government in 1981 to stimulate the economy, an attempt which foundered in the face of import leakages and balance of payments difficulties.

Fourth, the reservations about demand reflation in Europe are also based on a belief that Europe is suffering from a variety of structural problems - inflexible labour markets, excessive taxation and public spending, and a decline in technological development and innovation - and that these factors must be corrected by supply-side measures before any sustained non-inflationary growth is possible. I believe that the unfavourable comparisons in these matters that have been drawn between Europe on the one hand and the United States on the other, are often exaggerated. Nevertheless it must be pointed out that inflation and unemployment were on the rise in many countries in the years immediately preceding the first oil price shock in 1973, and that the adverse forces mentioned were at least partly responsible. In this connection, a recent paper by Scherer (1984) provides evidence that two key indicators of the supply of new technology - the number of patent applications and the growth of R & D expenditure - declined in most countries in the second half of the 1960s or in the early 1970s. The only major exception was Japan, though in the US there has been a recovery in the growth of R&D spending since 1976. It would be wrong, therefore, to conclude that the upheaval following the oil price increases was the only factor underlying the stagflation of the period since 1973.

A GLOBAL SOLUTION?

Because of the global dimensions of the unemployment problem, it seems plausible that a general solution can only come on a global basis. The following would seem to be essential ingredients of any such solution:

(i) Co-ordinated International Reflation.

No single country that is open to international trade can tackle this issue entirely on its own: indeed, paradoxically a small country, if it were sufficiently resolute and flexible, would have a better chance of doing so - as the examples of Switzerland and Austria show. A resumption of growth of output is essential to solving unemployment and could help to raise real incomes in a non-inflationary way through increased productivity. But the maintenance of output growth in countries generally requires a general growth in demand. Each country acting alone will be reluctant to lead off this process, since if its lead is not followed, it will end up with an unsustainable balance of payments position. It is true that the US in the past two years, because of its size and low import ratio, has managed to maintain strong recovery primed by fiscal expansion, but even in that case serious doubts exist about how long such a stance can be sustained.

(ii) A Consensus on Income Distribution within Countries.

A co-ordinated expansion of demand on its own, however, while it would do much to solve unemployment would not necessarily bring down inflation and could very well make it worse. An orderly

progression of incomes within countries is essential if full employment is to be reconciled with price stability and with the preservation of an adequate surplus to sustain investment and growth. No democratic country can impose this without the active co-operation of the other agents in society - management, trade unions, pressure groups and so on.

(iii) Efficiency in Investment and Public Expenditure.

While in the short-run any increase in demand through investment or public expenditure is likely to boost activity, in the medium to long-term it matters a great deal how effectively the resources are applied. Wasteful investments or public expenditures inevitably bring inflationary pressures in their train, and ultimately damage employment prospects. This viewpoint is often monopolised by those who want to cut investment or public expenditure, but there is no necessary link between the two viewpoints. Since there is no shortage of public needs, increased efficiency in public expenditure offers the possibility, if society so chooses, to have more and better public goods and services.

(iv) Flexibility in Resource Allocation.

At both the international and national levels, there is considerable scope for improving resource allocation through greater flexibility in trade, production, and the deployment of resources. At the international level, liberalisation of trade in services has not yet been developed with the same energy as trade in goods; while even in the case of the latter, there remain important non-tariff barriers. Domestically, in all countries

in varying degree, there are rigidities that hamper innovation and productivity growth, such as restrictive work practices by trade unions, businesses and professions.

(v) Generalisation of the Benefits of Technological Change.

At any given time, technological progress takes place at widely different rates in different industries. If the fruits of rapid technological change are largely appropriated by workers and employers in the relevant activities, rather than generalised to the community as a whole through reduced prices, then the potentially beneficial effects of technology in lowering prices and raising employment will be thwarted. This suggests a sceptical approach to the so-called productivity deals.

I believe that if solutions along these lines at national and international levels were pursued, there need be no fears about the consequences of technology for employment. On the contrary there would be ample scope for both rising living standards and increased employment. Technology will indeed continue to displace labour in *some* activities, but with proper overall economic management, new activities can more than compensate - as past history has clearly shown. Society may very well chose to take out some of the fruits of rising productivity in the form of reduced working hours, longer holidays, career sabbaticals etc.. But it is important to note that these benefits are likely to be gradual, and that they are more suited to periods of increasing general prosperity, rather than as a solution to an acute unemployment problem resulting from depressed levels of activity. I conclude therefore that prevailing ideas that

"work is dead", and that we should prepare our young people for a leisure society, are not a sensible response to current problems.

THE IRISH CASE

While Ireland, as a very open economy, is profoundly affected by international developments, it has only a limited role in influencing such developments because of its small size. To a great extent it must take the world situation as given and try to adapt itself to improving its own performance in prevailing world conditions.

Traditionally, unemployment in Ireland has been high by international standards. As a result of an acceleration in economic growth in the 1960s, the unemployment rate fell compared to the 1950s, but never went below 4 per cent of the labour force. In the 1970s there was an unprecedented rise in employment in Ireland, but since labour force growth also accelerated sharply, the unemployment rate rose considerably during that decade. The rise in the Irish unemployment rate in the 1970s, however, was less than in the EEC as a whole, due partly to the more expansionary fiscal policies pursued in Ireland. But these policies led to an unsustainable public finance position, and the necessary measures to check government borrowing in conditions of prolonged world depression have contributed to a much greater rise in unemployment since 1980 in Ireland than in Europe or the US. By the end of this year, the expected rate of unemployment, at close to 17 per cent, represents one of the highest among OECD countries. Moreover, barring a resumption of large-scale

emigration, the labour force in Ireland will go on growing faster in Ireland than in most of these countries: something like 20,000 net new jobs a year on average will be required over the next decade to keep unemployment from rising further.

But if Ireland has a high unemployment problem, it also suffers from a relatively low level of income per capita, its resources are relatively underdeveloped, and there is still a large amount of poverty. In its quest to solve the unemployment problem, therefore, Ireland cannot afford to pass up the benefits of technological advance and rising productivity. The only course that offers the possibility of satisfying the community's aspirations for higher employment *and* higher living standards is through economic growth, combined with measures to ensure that the benefits of growth are distributed so as to provide adequate work for a rapidly growing labour force.

A long-term strategy along these lines was outlined in great detail earlier this year in an ESRI publication (Conniffe and Kennedy 1984). The foundation of any such strategy must be built on the traded goods sectors - agriculture, natural resources, manufacturing and a number tradeable services. It calls for major policy initiatives in regard to technology, marketing and manpower development, combined with incomes policy to secure moderation in pay.

But what of the employment implications? How many jobs would it plausibly yield, and where might these jobs arise? As far as agriculture is concerned, it does not seem that any realistic

measures can arrest a decline in numbers engaged - perhaps, at an average rate of about 3,000 per annum. The situation in manufacturing is more complex. In many of the advanced countries manufacturing employment has been declining since the mid-1960s, not only in share of total employment but even in absolute terms. Since Ireland is less developed, however, and has a low share of its labour force engaged in manufacturing, it could be argued that there is scope for great gains in manufacturing employment.

Nevertheless the past record has not been encouraging, unless there is a very substantial acceleration in the growth of production - and this may be difficult to achieve given the likely world demand conditions. As Table 3 shows, Ireland was one of the few countries which experienced a higher rate of productivity growth in the period since 1973 than in the previous decade or so. Granted, the high productivity growth in manufacturing in the decade 1973-83 was strongly influenced by one industry, office and data processing machinery; and if this industry were omitted, Ireland would be in line with the generality of countries in experiencing a drop in the rate of growth of productivity after 1973. But as far as manufacturing *employment* is concerned, the net overall position in the decade 1973-83 was that despite a respectable growth in output of close to 4 per cent per annum, employment in 1983 was 10 per cent less than in 1973. True, as may be seen from Table 4, the drop in employment has been concentrated in the depressed period since 1979. Moreover, since employment adjusts with a lag to changing output, it is highly probable that the current revival in production will be followed in due course by a pick-up in manufacturing employment. But Table 4 also illustrates that if

TABLE 4

Average Annual Growth Rates in Irish Manufacturing, 1973-79 & 1979-83

	Output	Employment	Manhours	Output per head	Output per manhour
<i>Total manufacturing</i>					
1973-79	5.1	0.7	0.6	4.4	4.5
1979-83	1.8	-3.5	-4.5	5.5	6.6
<i>Total, excluding office & data processing machinery</i>					
1973-79	4.6	0.6	0.4	4.0	4.2
1979-83	-0.9	-4.0	-5.0	3.2	4.3

Source: CSO Industrial Inquiries.

output growth is heavily concentrated in new industries like office and data processing machinery, which have an exceptionally low labour share in value added, then any given rate of growth of output is likely to yield a smaller employment gain than in the past. Certainly, even with a considerable acceleration in output growth, it is difficult to see manufacturing employment rising by much more than 2 per cent per annum, or about 4,000 extra jobs per year on average - that is, about the middle of the range suggested in the Government White Paper (1984) on Industrial Policy.

It would be implausible therefore to expect that the traded goods sectors will provide directly more than a fraction of the jobs needed to match the prospective growth in the labour force. Expansion of output and incomes in the traded goods sectors will also, of course, generate jobs in other sectors - either through

purchases of producer goods as inputs, or through consumer purchases out of higher incomes. But there are a number of factors also which limit the extent of such induced employment effects: the high import leakages, the fact that there is overmanning already in some important market services (e.g. transport and communications), while in other services (e.g. banking) labour-saving technological changes are in process of application. Even taking an optimistic viewpoint, it seems unlikely that the direct and induced employment effects in the market sector of the economy will be large enough to bring down unemployment.

Successful development of the traded goods sectors does, however, offer another opportunity: it provides government with more revenue at current tax rates, which could be used in a variety of ways by the authorities to create more jobs. One possibility is more public sector employment. As Table 5 suggests, this was a significant contributor to employment growth in most OECD countries in the post-War period. But for those who reject this option there are other possibilities by which the public sector can supplement employment growth in the market sectors, such as third sector activity, public works, special employment schemes etc. All of these have the common characteristic of requiring State funding that must be paid for sooner or later out of tax revenue, and which is channeled directly or indirectly towards domestically-supplied, relatively labour-intensive, goods and services that would not otherwise be demanded and supplied to the same extent. It is worth noting that in the Government National Plan (1984), issued last week, even though it provides for a cut in regular public sector employment, yet about one-half of the

Table 5: Average Annual Growth Rates of Public Sector and Private Sector Employment, OECD countries, Various Sub-periods, 1960-1982

	1960-65		1965-70		1970-73		1973-82	
	Public	Private	Public	Private	Public	Private	Public	Private
	%							
Ireland	1.8	0.1	3.2	-0.6	5.3	0.2	4.1	0.5
Australia	2.6	n.a.	3.6	2.1	2.8	2.1	2.2	0.8
Austria	2.0	-0.4	2.5	-1.2	4.5	0.6	2.7	-0.1
Belgium	2.5	0.7	1.8	0.5	2.4	0.5	2.7	-0.8
Canada	n.a.	n.a.	4.8	1.6	3.8	3.2	2.1	2.1
Denmark	n.a.	n.a.	6.7	-0.5	7.1	-0.5	4.5	-1.4
Finland	4.1	0.3	5.0	-0.4	4.8	0.2	4.4	-0.8
France	-0.5	0.7	2.2	0.7	2.7	0.4	1.4	-0.2
Germany	4.6	0.1	2.5	-0.5	4.2	-0.1	1.9	-0.9
Italy	2.8	-1.3	2.4	-0.3	4.5	-0.8	2.2	0.5
Japan	n.a.	n.a.	n.a.	n.a.	3.1	1.0	1.7	0.8
Netherlands	1.0	1.5	1.9	0.7	2.3	-0.4	2.1	-0.5
Norway	3.5	0.7	4.2	0.3	4.5	-0.3	3.6	0.6
Switzerland	3.5	2.1	3.9	0.5	3.6	0.6	1.6	-0.8
Sweden	4.5	0.2	6.9	-0.5	5.2	-1.2	4.5	-0.4
U.K.	-0.1	1.0	2.5	-0.9	3.1	-0.3	0.9	-1.1
U.S.	2.9	1.5	3.9	1.9	0.5	2.4	1.3	2.0

Sources: OECD *Employment in the Public Sector*, Paris, 1982. Updated figures, and some revisions in the earlier figures, have been kindly supplied to the authors by the OECD Secretariat. The Irish figures are taken from Conniffe and Kennedy (1984) and relate to the periods 1961-66, 1966-71, 1971-75 and 1975-81. Public sector employment covers public administration and defence, health and education services, and non-commercial semi-state bodies. Private sector employment is measured as total employment less public sector employment.

envisaged net increase in total employment will be funded by the State through schemes of this nature.

CONCLUSION

The foregoing discussion of policy options has brought to the forefront a point of fundamental importance about employment, namely, its central role in the wider issue of income distribution and redistribution. To the extent that the market system can provide enough jobs for all who are willing and able to work, then this will go a long way towards widely distributing the fruits of economic progress. In that case, the State's redistribution activities could be confined to measures for moderating disparities in after-tax incomes, helping those with many dependants and taking care of those who are unable to work. When, however, the market system, even when given maximum feasible encouragement by the State, still leaves a large and growing minority unemployed, the State is now confronted with a more acute income redistribution problem. In essence, the State can either go on paying unemployment compensation, or it can create or fund jobs. The latter requires more tax revenue than the former, but can add to the supply of useful goods and services.

I believe that the latter course is not only more humane, but in the long-run more efficient - even if it does require maintenance of tax rates at a high level. Given the prospective situation in the world economy, nobody has yet been able to establish convincingly that the market sector in Ireland, no matter how much primed by incentives, grants etc., will itself

provide enough jobs to bring down unemployment. In such circumstances it would scarcely be sensible to go on paying people to be idle when there are so many social and environmental needs they could supply. Moreover, the social consensus needed to maintain satisfactory incomes, industrial and other policies, that are essential to the creation of wealth, is unlikely to survive in the face of prolonged unemployment.

Finally, while much attention has been devoted to rigidities that can develop in full employment conditions, not enough attention has been devoted to the resistances to adaptation and the application of technological progress that are likely to arise when there is a prolonged scarcity of jobs. In this connection it is well to recall that Europe up to the early 1970s managed to sustain an unprecedentedly high rate of productivity growth in conditions of full employment. Europe's performance on both counts far outstripped that of the United States - notwithstanding the much vaunted flexibility of labour markets in the US. And if Europe's performance now is inferior in several respects to that of the US, the explanation in my opinion lies less in structural rigidities than in the unwillingness and/or inability of European governments to devise co-ordinated demand reflationary measures.

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