New Technologies and Aged Workers

by Luigi Frey *

Research conducted on labour market prospects in industrialized countries has shown that a considerable increase may be expected in the number of people offering their labour between the ages of 50 and 65 years, as well as a likely expansion also among those over 65 who, though officially registered as retired (and therefore in receipt of a pension) may still be hoping to undertake work of various kinds.

Among other things, research in progress on the effects of the spread of new technologies in industrialized systems has provided a basis for assumptions that its diffusion is tending to encourage older people to take up work.

1. Teachings from United States experience

A report by the Technology and Aging in America Panel (chaired by Robert Binstock) set up by the Office of Technology Assessment of the United States Congress¹ indicates that the so-called new technologies can act as an incentive to older people to continue labour supplying since:

- a. Their use can affect the health and lives of older workers, extending their potentially active life in a way that would cause them to feel discontented and excluded from society were they to be definitively ousted from production and/or unable to earn a steady income sufficient for the many years they will probably live after "formal" withdrawal from work, as envisaged by the law or by the contracts governing their employment;
- b. it can be useful to those suffering from physical disabilities and can offer suitable working arrangements to compensate for lack of physical strength or for other forms of weakness consequent upon advanced age;
- c. it can lessen the need for exposing workers to particularly dangerous and, in any case, increasingly unpopular forms of work;
- d. it can improve both monetary and non-monetary conditions of work thus providing incentives for people to continue in activity until late in life;
- e. it can in some degree favour retraining of older workers by providing tools and equipment more easily accessible, utilizable and better able to cope with problems of quality posed by technological and organizational changes;

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¹ See Technology and Aging in America, Washington D.C., Congress Office of Technology Assessment, Ota-Ba-264, June 1985.

- f. it can facilitate diffusion of part time work complying thereby with the needs of older workers in this direction, especially of those who draw a pension and also do a job;
- g. it can make available new kinds of jobs which, on account of the qualitative characteristics required by employers, are particularly suited to elderly workers.

The effects briefly set forth under (a) to (f) above should play a considerable part in creating a greater demand for work by the over 65s, as well as a demand by those between 50 and 65 years, decidedly above the levels implied by rates of activity forecast hitherto.

It should however be stated that the effects of new technologies on the increased demand for jobs in terms of flows relating to a period of time (a year, for example) are not necessarily proportional to those that can be defined in terms of stocks of persons (annual averages or those ascertained on a certain day/week). Older workers for whom new technologies provide incentives to seek jobs could in fact do so for a number of hours per year different from the assumed average for workers already forming part of the active population; it appears likely from the results of research, even though partial, that if older people are receiving a pension or some other transfer of income, and the more so the older they are, they are prepared to offer work for fewer hours than the average found for explicitly employed people of the same age group.

This means that availability of work for shorter periods of time, with related aspects of flexible organization of such work, can play a very important part, together with the presence of new technologies, in encouraging older people to offer their labour.

On the other hand, as is clear from letter (g) above, the supply of labour also depends on trends in jobs available.

Generally speaking, to explain the effects on the demand of labour, the way new technologies affect the sectorial and professional structure of this, in terms of stocks or of flows, is usually discussed. In terms of stock, the structure of the demand of labour is normally considered on the basis of the persons employed on an average in one particular year.

From the point of view of the sectorial structure of employment, it is considered that the new technologies (together with various other factors) will, in the near future, make their contribution to determination of far-reaching changes expected in the industrialized countries. The United States provide a highly significant example of such expected changes and the BLS of the Labor Department has made available analytical forecasts of what will happen shortly. Here we may mention that these forecasts have recently been updated moving the date forward from 1995 to 2000.² According to the new data, a slight fall is expected between 1986 and 2000 in overall employment figures in manufacturing while the increase in trading, in financial and in various private services is expected to be even more marked than in the past. In some specific branches of manufacturing (and in rail transport) a very big reduction is expected while in some services (including data processing) the forecast rise is particularly noteworthy.

Information (of a more partial nature and nearer in time)³ on other industrialized countries in the west is more or less the same; overall employment in manufacturing is

² These forecasts were presented for the first time in "Industry Output and Employment Through the End of the Century", by V. A. Personick, published in *Monthly Labor Review*, September 1987.

³ See, for example, A. Rajan, R. Pearson, *U.K. Occupational and Employment Trends to 1990*, Butterworths, London, 1986.

expected either to fall or to show little change; employment in services, especially in miscellaneous private services is expected to rise considerably. In some countries, where employment in agriculture is proportionately higher than in the U.S., there too a marked reduction of such employment is expected.

To what extent are these trends in employment due to new technologies? How far can the forecast movements upward and downward diversely affect the older workers compared with others of normal working age?

It is no easy matter to give a clear answer to these two questions. Neither has satisfactory research on this matter been carried out in the United States. First and foremost, however, new technologies must be considered as having a particularly important effect on production of machines and equipment incorporating such technologies, on the services closely linked to its diffusion, on activities where it is most likely that new technologies lead to replacement of labour by capital. This means that application of new technologies will affect levels of employment (though actually to no great extent) in a positive way as regards production of semiconductors, electronic components generally, measuring instruments, telecommunications equipment, or else employment in activities (where the increase, both absolute and relative, would be much greater in the near future) such as services connected with computers and electronic data processing (in the U.S. the highest average annual percentage increase expected by the year 2000 and holding eighth place as an absolute increase) and some financial services. Further, new technologies will have negative effects especially in a fairly wide range of manufacturing work and in transport services.

Taken as a whole it may be assumed⁴ that new technologies will make themselves felt on the expected changes in the sectorial structure of employment in the sense that it will: 1) lead to a net reduction of the numbers engaged in manufacturing, as a growth in employment in activities involving high technology would not balance the opposite effect of a speed-up in replacement of labor by capital in most branches of manufacturing; 2) make a big, even if not directly, decisive contribution to growth of employment levels in services.

To reply now to the second question posed above, it would be necessary to know how workers of different ages are spread throughout the various branches of manufacturing and within the activities that supply services. Sufficiently up-to-date information on these points is unfortunately lacking in practically all the industrialized countries.

2. Prospects of employment for older people

Research in Italy as elsewhere⁵ has shown that an answer to the above question on prospects of employment for different age groups of workers can only be based on indirect information.

⁴ For the most part these are assumptions based on research of different fields of industry carried out in the U.S. and in Europe, on the effects of microelectronics and telematics on employment. See for example R. Rothwell and W. Zegveld, *Technical Change and Employment*, F. Pinter, London, 1979; OECD, *Microelectronics Robotics and Jobs*, Paris, 1982; J. Northcott, *Microelectronics in Industry, Promise and Performance*, Policy Studies Institute, London, 1986; P. Patel and L. Soete, "Technological Trends and Employment in the U.S. Manufacturing Sectors"; K. Guy, "The U.K. Tertiary Service Sector", and L. Soete, "The Newly Emerging Information Technology Sector" in *Technical Change and Full Employment* (C. Freeman, L. Soete eds.), Blackwell, Oxford, 1987.

⁵ See L. Frey, *Nuove tecnologie e persone avanti nell'età*, Angeli Milano, 1988; ID., "Economia formale ed economia informale: il ruolo del lavoratore avanti nell'età", *Oggi domani anziani*, N.2, 1988.

However, to reduce something on this point as regards older people, more attention must be paid to the fluxes of labour demand than to the qualitative structure of stocks of occupation. It is known that, in terms of people, distinctions are made between the numbers entering employment and those leaving it. In order therefore to define employment prospects for older people, we would have to see to what extent they risk losing their jobs and how far their chances of being taken on, compared with younger workers, are less both in industry but most of all in tertiary activity where levels of employment are expanding.

Though still inadequate, the research already done and that in progress lead to the assumption that older people, especially those of 50 and over, are particularly exposed to the risk of losing their jobs where restructuring of production is being undertaken to a large extent involving introduction of new technologies. This assumption is strengthened by studies carried out in the United States: there, the "displaced workers" are for the most part "adult", namely from 40 to 45 years and upwards, and among the causes of this "displacement" one of the most important is technological progress which, it is said, requires certain qualitative characteristics of the worker if he is to keep his job.⁶

Indirect indications of the situation in Italy may be gained too from observation of stocks of unemployed and retired people aged between 40 and 64 years. Although many uneven aspects are present and comparison between data for 1982 and for 1986 must be made with caution, the very considerable rise in unemployment among people between the ages of 40 and 49 years, the anything but negligible increase of unemployed in the 50 to 59 age group and the really remarkable number of cases of retirement (both in absolute and in relative terms), between the ages of 40 and 64 years, may well indicate the presence of a high rate of apparent exclusion (at least formal) from jobs of older workers just in a period when in Italy the use of new technologies has become more and more widespread bringing with it a rise in the numbers employed, especially of workers between 25 and 39 years of age. An analysis of changes in the employment structure by large professional groupings appears however to offer rather more uncertain indications. If we take the group described as "workers and the like", for which a marked reduction in employment was recorded between 1982 and 1986 at least partly due to restructuring following introduction of new technologies, it will be seen that the sharpest reduction, in absolute and relative terms, occurred in the following age groups: 15 to 19, 30 to 34, 40 to 44 and 50 to 54. No reduction was recorded for the age groups above these.

As regards the situation in Italy, therefore, it seems possible to assume that, apart from problems relating to young people below 20 years of age, the risks of losing jobs are greatest for people between 40 and 55.

On the other hand, data on variations in stocks of employed in Italy offer no indication to support the view that, due to their being older, these same people have encountered greater difficulty in obtaining new jobs made available by application of new technologies.

This, at first sight, would also appear to be the case examining professional groups whereby, in the United States, a greater positive variation is expected in the near future in the stock of employed. In fact it seems unlikely that people between the ages of 40 and 60 years would have difficulty in competing with younger ones for jobs like retail sales

⁶ See the Office of Technology Assessment report *Re-employing Displaced Adults*, U.S. Congress, Washington D. C., February 1986 and its extremely extensive bibliography.

employees, waiters and waitresses, cleaners, medium to high office posts and office jobs generally, nursing auxiliaries. There is no solid basis for believing that age in itself can be a discriminating factor; indeed, for some of the professional groups referred to, it could well be thought that older people, with all the experience they have gained, should find themselves in a favourable position.

The problem is clearly not one of age as such, rather is it a question of the qualitative characteristics that older people so often lack.

It follows that prospects of employment for aged workers against a background of far-reaching technological and organizational changes, depend to a great extent on whether or not suitable strategies exist for *retraining* the workers concerned. It would seem that such strategies are decisive for enabling such workers to adapt their skills to suit the new methods of working they will encounter.

Retraining strategies raise a number of problems for the workers who should benefit from them. One of these, decisive for their success, is realization of suitable integration between training time and working time for the older people requiring retraining.

In other words the role of innovations in the management of working time once more comes to the fore: not only can these innovations encourage aged workers to keep their places within the productive system, but they can also favour suitable processes of re-training (including recovery of important aspects of basic education) so as to make these workers better able to adapt to the constant changes brought in by diffusion of new technologies.

3. Management of working time for older workers

Normally, in this connection the measure that most directly relates to the older worker is *early retirement*, namely advanced pensioning for workers (often between 50 and 60 years of age) with the aim of permanently cutting out jobs that are either in excess or no longer required by employers without depriving the persons concerned of an income even though a lower one than they could have had if they had left work at the age laid down by law and/or by their contract.

The main idea behind the measure of early retirement has not been however, in the industrialized countries where it has been introduced, to mitigate the economic and social problems of older workers risking unemployment or having to seek a poorer paid job, but rather to persuade workers of a certain kind to leave their posts in favour of younger ones better able to cope with the needs of changed conditions. In these countries retirement, "formally" made definitive is encouraged by measures to persuade older workers to leave the labour forces:⁷ one of such measures is the assurance that they will not lose their rights to pensions they would have received had they left work at the normal retiring age; another is payment of a lump sum to integrate their leaving indemnity or similar leaving payment.

⁷ See comments on the subject, including references to explanatory assumptions, by R. A. Hart in *Working Time and Employment*, Allen & Unwin, Boston 1987, pp. 238 and following. An example of incentivised retirement is found in the United Kingdom with the Job Release Scheme which offers special treatment for men prepared to retire at 62 years and for women at 59 on condition that they are replaced by young people on the Labour Exchange lists.

Since 1980 early retirement has been applied in Italy as well for older people working in industry⁸ and even before then for women in public administration as well as for some men engaged on work of a particular kind. Experience has shown however that retirement from work in these cases has only been "official" since many of these retired people have gone on working but often in situations of underemployment or in any case without the protection of a regular contract.

To overcome problems of this kind, one possibility is to follow the course of *part-time early retirement*, proposed by a number of industrialised countries with the aim of increasing the number of jobs available but without completely excluding the older workers.⁹ While one aim of this procedure is to make the change-over from a salary to a pension more gradual for them, another is to enable the older and more experienced worker to guide a younger replacement worker made possible by the fact that the older worker is doing a shorter number of hours.

Up to now it seems that experiments with part-time early retirement have not been very successful¹⁰ since they have neither favoured "explicit" occupation for older workers nor have they made more jobs available for the younger ones.

It does seem, however, that the recent considerable increase in part time work in many western industrialised countries has not only benefitted middle-aged women but most of all young people under 25 making more "explicit" the labour available by student-workers.

In this case, establishment of work on a part-time basis would seem to be greatly connected to the fact of its really having been able to reconcile time for study with time for work.

Similarly it is thought that were part-time early retirement (namely part-time work recognised by law and by contract) to be accompanied by measures to retrain older workers in order to keep them in production for a longer time, this might be a better solution both for the workers concerned and for production itself and meet with greater success in terms of the number of older workers involved and therefore in terms of possible effects on levels of employment.

Seen in this way, however, partial early retirement tends mainly to turn into a kind of *flexible pensioning* arrangement especially if the worker's choice is voluntary even if there are accompanying attractions of one sort and another. Retraining schemes would in fact have little significance for workers, and especially for employers, if "normal" and full pensioning age were to be rigidly maintained only a few years following early retirement; from the standpoint of making the best use of available human resources apart from that fulfilling workers' needs, effective retraining becomes, on the other hand, of great value to the extent to which these latter can extend, for a good number of extra years, the combination

⁸ See references in Appendix I (pp. 58 and foll.) in L. Frey, *La misurazione degli effetti delle politiche del lavoro in Italia*, Angeli, Milano, 1985.

⁹ For some details about these arrangements see A. L. Gustman, T. L. Steinmeir, "Partial Retirement and the Analysis of Retirement Behavior", *Industrial and Labour Relations Review*, No. 37, 1984.

¹⁰ The OECD report *Shorter Working Time* (Paris 1984, p. 28) lays special stress on the experience gained in Sweden.

¹¹ See data and comments in OCSE *Perspectives de l'emploi*, 1987, Paris, September 1987, pp. 31 and following.

of part-time work with more or less “partial” pensioning. It would in fact tend to become a flexible pensioning arrangement which, envisaging the possibility of a regular continuation (even with shorter hours) of working life beyond the “official” pensioning age, would give a positive response more to the growing potential capacity for work of older people (even over 60-65 years) than to the offer of labour from young people. In other words this would be a flexible pensioning arrangement with an aim rather different from those which experience in this field has benefitted up till now.¹²

This arrangement, on the other hand, could better fulfil the needs of active participation felt by older people than can the voluntary initiatives in various fields (social services in particular) put forward as ideas for people who have retired early or who are pensioned off at the normally recognised age.¹³

It should be noted however that, within the limits allowing workers to carry on after the “normal” retirement age, flexible pensioning leaves the realms of early retirement and can become pensioning by subsequent stages; and this can be added to by employment at shorter hours as well as by other forms of working arrangement that favour (perhaps by certain modes of organizing work) employment of workers, even older ones, without detriment to their professional level.¹⁴

Results of some American research show, however, that for physical or other reasons older people may well prefer a job with shorter hours and differently organized to one which a full-time employee generally has to do. Ways of organizing work time that favour this new kind of arrangement, perhaps allied to benefits from transfers of income from certain rights that have accumulated during a working life, can therefore give an important contribution to solving the increasing problems connected with employing people who are becoming older and older.

On the other hand these increasing problems are actually due to the inability of the productive system to provide a satisfactory answer to the growing search for paid work by older people.

Therefore, in the same way as retraining strategies, methods of handling working time mentioned must form part of employment policies and organization of work that aim to give a positive response both from the standpoint of labour demand and from that of the growing desire of older workers to continue their activity.

Clearly, the task of public bodies and organized social forces when dealing with questions of structural and employment policies is even more difficult and complex than might be thought considering the other delicate aspects of employment problems (those concerning young people, women, residents in certain regions).

¹² See again the OECD report referred to in note 10, pp. 27 and following.

¹³ See J. P. Suer's report *Changer la retraite*, in La Documentation Française, Paris, 1984, handed in to the French Prime Minister in November 1984, especially in the third part. As B. Rosen and T.H. Jardee note in *Older Employees – New Roles for Valued Resources*, (Dow Jones - Irwin, Homewood, Ill.), flexible pensioning can better enhance the abilities of older workers.

¹⁴ See M. H. Morrison, “Work and Retirement in an Older Society”, in *Our Aging Society* (eds. A. Pifer, L. Bronte W. W. Norton & Co. New York 1986 pp. 357 and following.

On the other hand, within a context of unceasing technological and organizational changes, the fact that older people are becoming increasingly interested in carrying on working appears highly positive from the economic and social point of view, apart from the consideration that it cannot be stopped. To neglect it would inevitably mean constant aggravation of problems of unemployment/underemployment (already considerable in Italy and still growing) for that group of job seekers, as well as serious consequences for the living conditions of these older people and their families, further leading to a series of repercussions on various economic and social structures, including financial.

It is therefore clear from past and present studies that any failure today over assisting aged workers to remain as effective participants in the various fields of industrialised production could only be described as shortsighted.