

Journal of

European Industrial Training

**The challenge of the age and competency
structure in industry for innovations and
human resource policy**

Martin Kröll

Institute of Industrial Sciences, Ruhr-University Bochum, Germany



Journal of European Industrial Training, Vol. 27 No. 7, 2003,
© MCB UP Limited, 0309-0590

(scenario 2: high immigration). Fuchs and Thon reach similar conclusions to the IAB (Fuchs and Thon, 1999). As the potential labour force declines, the average age of employees rises (Figure 1).

How sharp the drop in the potential labour force will be depends on the growth in the rate of female employment and immigration. Since many European countries are confronted with similar demographic developments, the question arises from which countries workers could emigrate. Moreover even Eastern European and Asian countries will be confronted with the problem of demographic transition in the medium and long term (Nikitina, 2000). Furthermore it has been shown in the past that despite the right to reside and work anywhere within the EU, migration from one EU country to another has lagged behind expectations. The recent experiences with the Green Card arrangement reveal also that labour market difficulties in Germany cannot be solved solely through immigration[3]. Yet the fall in the potential labour force cannot be compensated even when going by the scenario of an over-proportional increase in immigration and a high rate of female employment[4].

Consequently in the near future businesses will be faced with a shortage of younger

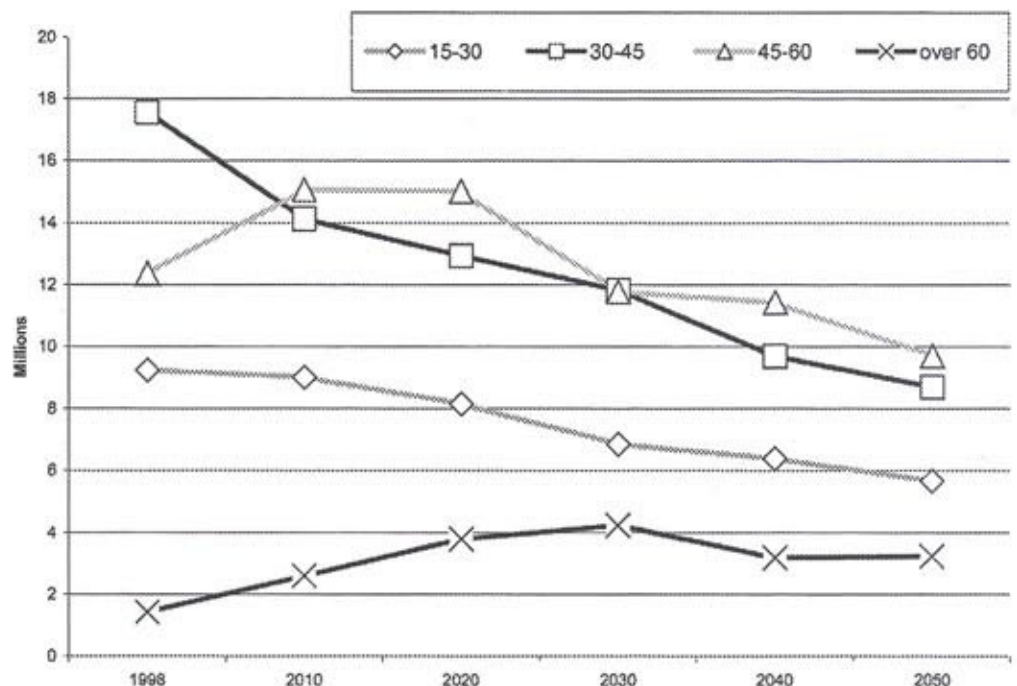
workers on the labour market and an increasingly aged workforce. As a result the competition between companies to recruit younger workers will rise. Pressure on younger people to enter the labour market earlier will be greater and this development will be linked to the intensified demand for a reduction in the duration of training and higher education for apprentices and graduates respectively[5].

In Japan the following development has been identified: the proportion of younger employees who embark on a professional career earlier and so complete neither higher education, further education nor training has risen (see *VDI – Nachrichten*, 2001). This change has led to increasing shortages of skilled workers. Taking the Japanese experience into account indicates an intensification of the already formidable recruitment drive for specialists and executive staff. Against the background of these changes, the difficulties surrounding the further employment in particular of older specialists and executive staff materialise with explosive force.

At the same time the following argument in the literature loses its validity: that promoting the interests of older employees – a danger commonly evoked – would inevitably lead to discrimination against younger employees

Figure 1

Development of the potential labour force as calculated by the German Institute for Economic Research (DIW)



Source: Schulz (2000)

(Kratzer *et al.*, 1998, p. 200). Moreover, empirical studies show that countries with a higher employment quota of 55-60-year-olds than Germany have without exception a lower unemployment rate (Blöndal and Scarpetta, 1999)[6]. It would of course be naïve to believe that the further employment of older people leads automatically to a lower unemployment rate. But as a result of easing of the burden on social security funds and reducing social security payments, indirect positive effects of the employment of older people for the labour market become apparent[7].

The potential labour force and its limited significance

Focusing solely on the possible development of the size of labour potential proves inadequate for an analysis of labour market changes. The implicitly held view that the potential labour supply is a quantitatively manoeuvrable number of persons to be deployed at will, simply impedes the debate about the difficulties of the further employment of older people and conceals the structural problems involved. Knowledge of the practical competencies of the employees would, for instance, be of particular interest[8]. Primary indicators of employees' competencies are their formal qualifications, yet formal qualifications tend to be less significant the older the employee.

Beyond the supply side (the number of skilled persons gainfully employed in the future), further information about the demand for labour and the required competencies is necessary. Opinions are divided in the literature over this issue. Some labour market researchers go so far as to maintain that the effects of rationalisation in the context of technical and structural change will escalate and that society will ultimately run out of work (Kistler, 2000, p. 114ff.).

Owing to the aforementioned deficits regarding knowledge of future developments on the labour market[9], circumspect treatment of the information in hand is called for. Caution is advised when dealing with the short-winded conclusions in the literature provoked by the predicted dramatic decrease in the labour force potential and considered urgent. By taking action for action's sake one cannot do justice to the problematic nature of the further employment of older employees.

Requirements for an increase in the proportion of older people in the workforce
Convention dictates early retirement in Germany. In the year 2000 the average age for retirement was 60.5 years for men and 58.5 for

women[10,11]. In accordance with the pension reform the age of retirement will gradually be increased. Those who seek earlier retirement must reckon with lower financial allowances. These financial forfeits lower the readiness with which older people withdraw from working life.

A comparison with other countries supports the well-founded belief that the proportion of older people in employment in Germany can certainly be increased. Thus the employment rate of 55-64-year-olds in other countries, according to the OECD, is considerably higher than in Germany (38.8 per cent) – for example in Switzerland (71.3 per cent), Norway (66.9 per cent), Japan (63.8 per cent), Sweden (63 per cent), USA (57.7 per cent) and Denmark (50.4 per cent) – though in Italy the employment rate for this age group is even lower at 29.9 per cent[12,13].

The status of older workers in the internal and external labour market

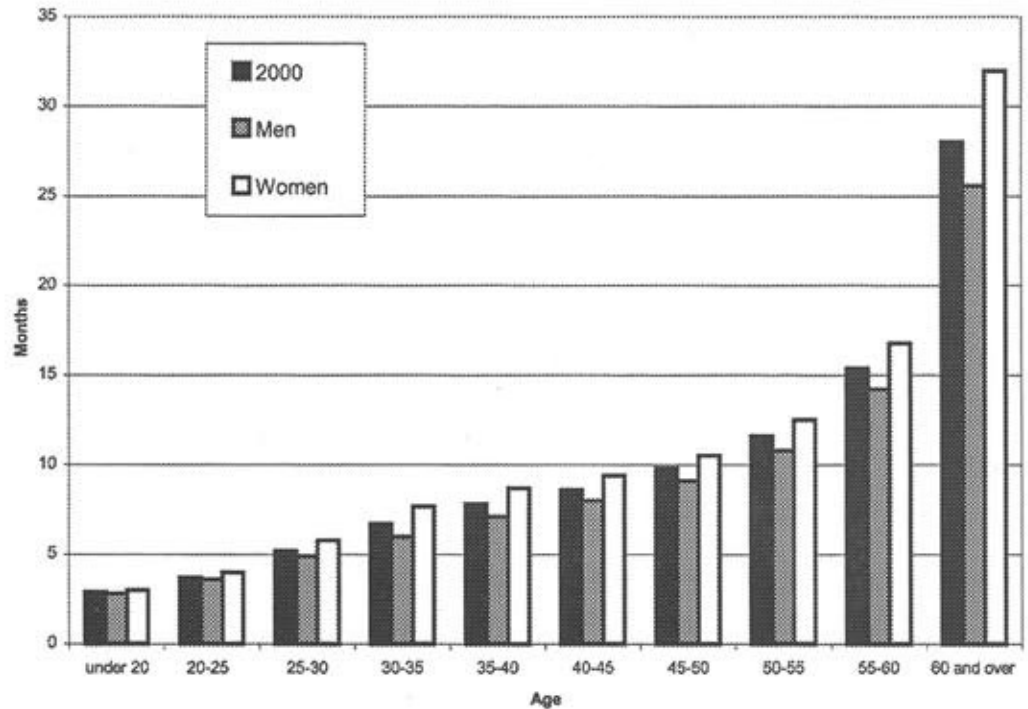
An indicator of the difficulties of older workers on the external as well as internal (intra-company) labour market is the extent and length of employment of this category of employees. Older members of the labour force are over-represented among the long-term unemployed, and unemployment among older people is generally an excessively prolonged condition (see Figure 2). Women are most acutely affected.

Older people as adjustment reserves in companies

Recent gerontological research has succeeded, if not in disproving the deterministic correlation between age and both mental and physical decline, then in differentiating. A wealth of occupational studies reveal that performance-related differences within an age group are greater than between age groups. Age is in no way the sole or even dominant factor determining efficiency and resilience. Of greater significance than physical age is the level of education, the degree of mental and physical training, occupation and so on[14]. One can therefore speak of "human ageing" (Walker, 1997; Koller and Plath, 2000) (see for example, Walker, 2002, p. 405).

Although empirical findings and scientific analysis have deemed the "deficit model of ageing" no longer tenable, it remains nonetheless deeply ingrained in company culture, as shown by empirical investigations (Walker and Taylor, 1998). For instance, in a topical BIBB survey, the

Figure 2
 Average length (in months) of unemployment (2000)



results revealed that in the last five years the proportion of older workers in the companies investigated has fallen (Federal Institute for Professional Training (Bundesinstitut für Berufsbildung), 1999, p. 2). Older staff continue to represent the human resource adjustment reserves (Walker, 1997, p. 79). Businesses have so far managed largely to buck the demographic trend.

Dequalification

Previous research findings suggest that health issues are not of especial significance for the further employment of older employees[15] (Hacker, 1996; Bullinger and Enderlein, 1996). The question of skill development and of the organisational integration of employees has in contrast a key role. Ultimately integration of older staff members in commercial enterprises only occurs when it is considered advantageous both from the point of view of the company as well as of those employees concerned.

Against the background of technological progress and structural change, the process of intra-organisational diffusion of innovations plays a decisive role. The opportunities and limits of this diffusion depend on the prevailing human resource and competency structure. With respect to the implementation of innovations, the various staff categories – such as specialists and executive staff or semi-skilled and unskilled workers – perceive different tasks.

Consequently in the organisation of structural change a key role falls to the specialists and executive staff. From the point of view of innovation management, not only skills that are lacking but also antiquated skills constitute a significant impediment.

The following empirical data illustrate that a high formal qualification does not function as a safeguard against unemployment in old age[16]. For example, a relaxation of regulations on the labour market for mechanical engineers and chemists led to an opposing trend regarding the older and younger workers (see Figures 3 and 4), forming what can thus be described as a divided labour market[17]. This development applies to almost all labour markets for scientific and technical specialists and executive personnel other than the IT sector.

In view of accelerated technical and organisational change, older specialists and executive staff members are confronted with the risk of “dequalification”, the downgrading or “de-skilling” of acquired expertise or personal competencies[18]. Highly qualified specialists and executive staff in the field of science are faced with the challenge of constantly updating their knowledge of technical developments.

Loss of corporate memory and wisdom

Depending on their occupation, members of organisations gather practical competencies

for utilisation in their professional field during the course of their professional lives in the form of specialised knowledge, occupational know-how, experience and skills. Through the industrial externalisation strategy older employees' practical competencies can be lost. The consequence of this loss is that experiences must be repeated unnecessarily. Older people's competencies must be put to appropriate use if this loss is to be avoided.

In the past, industrial loss of occupational know-how, experience and skills was hardly ever an issue. This view has changed in current debate (Koller and Plath, 2000), which does not however mean that the attitude of businesses towards older staff members has already undergone a transformation.

As far as knowledge gained through experience is concerned, there is the danger of succumbing to an illusion of harmony. Not every experience gained during the course of one's professional life proves helpful in doing justice to the changing tasks of the workplace or in driving innovation forward. This ungrounded illusion leads ultimately to disappointment on the part of those holding responsibility as well as those older employees concerned. At present there is a lack of analytical criteria by which to judge the older staff members' potential in terms of experience and skills. This deficit impedes an effective task and skill-related use of human resources, particularly with regard to older staff, and questions the legitimacy of the current social practice of human resource

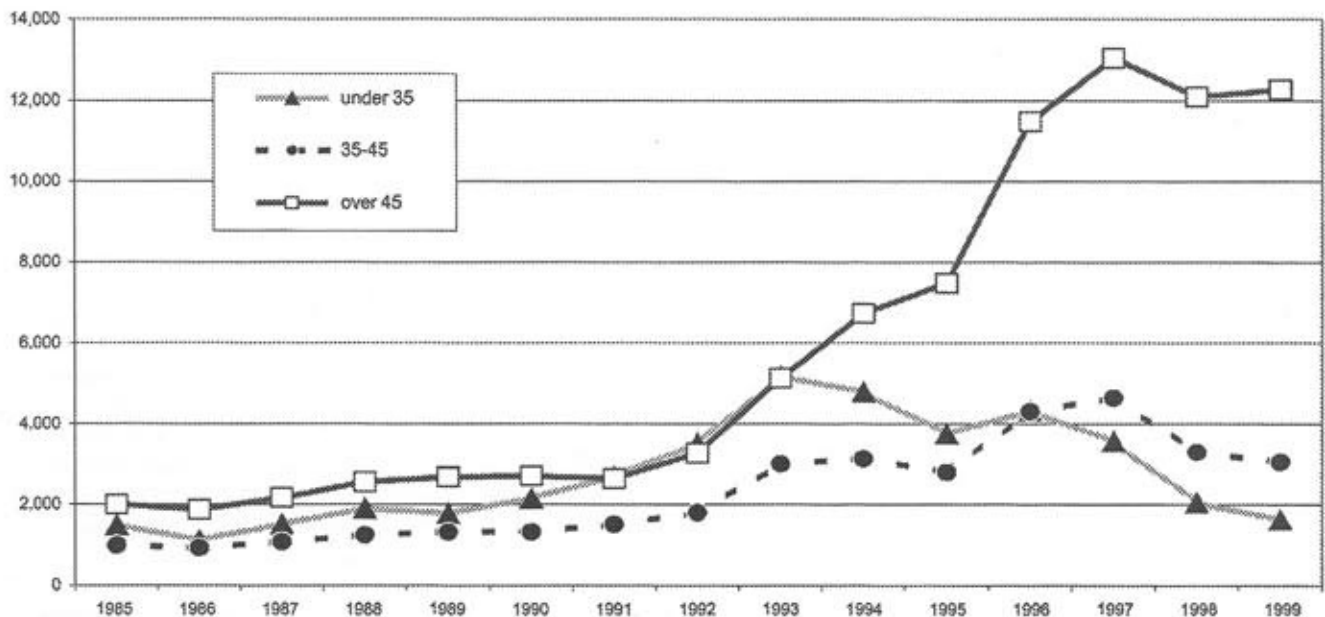
deployment. With regard to the deployment of personnel, transparency in the selection process is crucial in order to prevent decisions being made on the basis of "stereotypical" ideas as to the productivity, for instance, of older people.

Literature on the subject often falls back on vague arguments asserting that in business development human resources occupy a predominant position, that with regard to the older staff members it is necessary to care for and cultivate personnel (Kistler, 2000, p. 123), to handle them with care (Döhl, 2000, p. 130 ff.). The concept of human resource care implies a multitude of misunderstandings. The view that all potential employees should be regarded without differentiation as human resources of equal value, independently of their practical competencies, is consistent neither with the reality of the external nor of the internal labour market. This misinterpretation hides the structural problems that arise in relation to the further employment of older staff. Furthermore the "care" metaphor is inconsistent with the demand for greater self-organisation[19]. In addition it is often not appreciated that both an initiating and a limiting force emanate from personnel affecting the development of the organisation. The "care" metaphor is unsuited to the called-for realignment of HR policy in the context of the further employment of older employees.

Incentives

In the course of professional life the competencies acquired during the period of

Figure 3
 Unemployed mechanical engineers by age (2000)



initial training lose their significance in terms of operational usability, prove antiquated or are simply forgotten. At the same time personnel costs rise and in particular the ancillary costs per worker, whether due to collective labour agreements, industrial affiliation, or additional contributions of employers. Wage and competency development diverge. If employees do not pursue career-oriented competency development there is a danger that the wage and competency divide will expand further[20]. The divergence of wages and competencies escalates to the point where employers regard it as more advantageous to choose a young employee fresh from training rather than a 50-year-old with considerable professional experience[21]. It is clear then that the main problem in the context of the further employment of older employees is the "devaluation" of competencies rather than the ageing in itself.

Theoretically there are two possibilities to close the gap between competency and remuneration: consolidation of competencies to wage level or the adjustment of wages reflecting the competency level. The latter alternative is hardly feasible in practice, even less so innovative production on the basis of low wages and (even) lower professional competencies. How far the current demand for the dismantling of seniority privileges (Klöß, 2000) is likely to ease the difficulties in question is debatable.

Should competencies be linked with remuneration, it would be necessary to develop and introduce systems of incentives to motivate staff to develop their competencies. These incentives should take effect while the workers are still engaged in their occupation in order to avert

unemployment among those aged 55 and above and capable of employment. At present it is however unclear how systems of incentives should be developed with the aim of rewarding staff members for their competency development[22] – should participation on a training scheme already be encouraged or should remuneration follow only when newly acquired skills result in higher productivity and/or an increase in product or service quality? The current systems of remuneration promote external, school-like forms of advanced training – if any training at all – rather than competency development on one's own initiative[23].

Deficiency analysis of structural options for the further employment of older employees

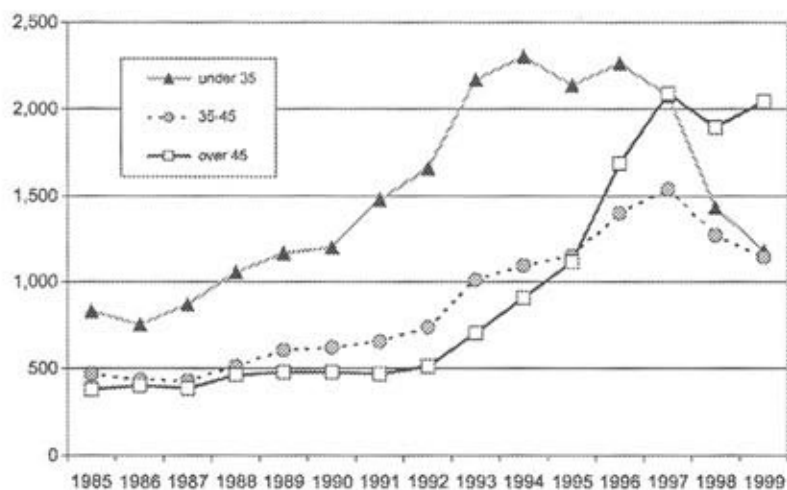
Many proposals to combat the problems arising from demographic transition are not new, such as the introduction and extension of part-time work for older people[24], the development of training schemes for older employees or the operational integration of older staff members[25]. If on the quest for "actionism", the assessment and restructuring of such activities is of interest, one must consider why the activities under discussion have not led to success, what the causes of these in part unintended effects are, and whether certain structural options are counterproductive as far as the further employment of older people is concerned. Misunderstandings leading to unrealistic expectations on the side of those responsible and those concerned must be clarified and overcome. These frustrated expectations become in turn decisive impediments to the further employment of older staff members. It is important to emphasise at this point that there are no "one best way" solutions[26]. On the contrary, even the quest for such answers is unrewarding. It is instead necessary to establish and evaluate the practical, time-related and social reasons for the exclusion of older employees.

The flexibilisation of working hours and part-time employment for older people

Against the background of the objectives underlying the pursuit of flexible working hours, a goal of various players in industry, there are further considerations of the problematic nature of part-time work for older people. The following points are at the heart of the debate over more flexible working hours:

- Increasing the responsiveness to changing market and/or production requirements

Figure 4
 Unemployed chemists (2000)



(higher quality, a shorter life cycle of products and services, greater product diversity), thus adapting the need for labour to perceived market and production requirements.

- More effective utilisation of technical equipment, such as capital intensive production plants; closely connected is the ever-widening gap between working hours and operating hours.
- Lowering personnel and ancillary costs, thus reducing hourly rates.

Greater flexibility of working hours in terms of the ability to choose the length and location of one's working hours is in the interest both of employees and employers. For employees adapting the length and location of the hours of employment to their own needs is a priority. More flexible working hours offers the possibility of greater "time sovereignty", which they value very highly. Flexibility is of advantage to businesses with the goal of achieving maximum utilisation of working capacity, suited to the rhythm of customer needs and desires as well as the production process. This development leads increasingly to an elimination of the boundaries enclosing the world of work, to a redefinition of the conditions of "work" and "life" and thus to a rejection of conventional working conditions (Pongratz and Voß, 2000). There is little consensus in the literature as to whether these "debordering" tendencies encompass all members of organisations or only certain groups of workers (Kühl, 2000).

By means of less favourable terms for early retirement arrangements and through the promotion of part-time work for older workers (see the *Altersteilzeitgesetz*, ATZG (Part-Time Work for Older People Act) of 23 July 1996), legislation in Germany aimed to encourage employers to revise their previous practice of pensioning off workers prematurely in favour of part-time work allowing a phased transition into retirement[27].

As of the age of 55, employees can take advantage of the Part-Time Work for Older People Act, an opportunity which was initially only rarely utilised. During the regulation's early days a formation of "blocks" was possible over the period of one year, that is, older staff members could work for six months and then be released from work for the second half of the year. The reworking of the law for a socially just guarantee of flexible part-time work arrangements for older workers offers the possibility of a two-to-six year period of support. "Block formation" is now possible

for one-to-three years[28]. Furthermore the criteria laid down by the staffing continuity and replacement regulation and used to fill vacancies have been relaxed, and the stipulated deadline for filling vacancies has been extended to four years.

Part-time work for older people is supported financially by the Federal Employment Service. In addition there are collective agreements based on the Federal Employment Service's support programme (Verband angestellter Akademiker und leitender Angestellter der chemischen Industrie (Association of Salaried Academics and Managerial Employees of the Chemical Industry), 2000). The Federal Employment Service's regulation and the collective agreements are however two separate legal arrangements independent of one another (see BGBl, 2000a,b). The collective agreements governing older people's part-time work are generally tied to the Federal Employment Service's regulation. The chemical industry's general agreement on conditions of employment allows for a stocking-up of 40 per cent in promotion of part-time work for older people. According to the agreement "an older employee working part-time is to receive at least 70 per cent of his previous net wage - when covered by labour agreements at least 85 per cent ..." (Verband angestellter Akademiker und leitender Angestellter der chemischen Industrie, 2000, p. 4). The stocking-up amount is exempt from social security contributions.

Apart from the part-time scheme for older people promoted by the Federal Employment Service, there are also systems of part-time work for older people which are not supported financially by the Employment Service. In these cases the employer amasses the income and social security contributions. The reason for forgoing compensation can be that the employer does not intend to fill the expected vacancy at all or at least not with an unemployed person or apprentice.

Recent experiences show that the reformed ruling on part-time work for older people meets with greater acceptance than the earlier legal requirements (Klammer and Weber, 2001). Through the Federal Employment Service's resources and support, and owing to the collective labour agreements, the financial losses for those affected are lower, while organisational difficulties arising in the reform of the part-time work scheme are cleared up through the possibility of block formation.

Furthermore, block formation offers firms the advantage of knowing earlier when their older employees intend to withdraw from work (Walker, 1997, p. 75). In this way firms

gain more time in which to exploit the practical knowledge and experience of the older employees.

In the year 2000 the Federal Employment Service's sponsorship was taken advantage of in around 35,000 cases. Experts at the Institute assume that three to four times as many part-time work arrangements for older people materialised as those sponsored by the Employment Service. A recent survey of works councils carried out by the WSI in Düsseldorf suggests that this figure could be considerably higher.

Indeed half the enterprises surveyed by the WSI offer the block-time model and the phased transition model simultaneously. However as a rule it is the block-time model that is put into practice[29]. The legislature's original intention of facilitating a phased transition into retirement is consequently not realised in practice.

The high organisational expenditure hampers the progressive reduction of working hours for older people. As far as operational work requirements and the preceding and succeeding organisational units at every stage are concerned, this form of part-time work creates an ever-greater need for consensus regarding the flows of information and materials geared to the customer and the net product. Moreover the corresponding co-ordination and communication competencies of the staff concerned are crucial in order for them to play an active role in structuring the hours of work.

It is questionable whether rearrangement of part-time work for older people has indeed led to a longer professional life for older employees. Experts familiar with the arrangement are doubtful that it has achieved an increase in the rate of further employment of older workers. The effects of the new arrangement of part-time work for older people on employment policies are also controversial (Klös, 2000). A large number of firms forgo reimbursement from the Employment Service, in order for instance to avoid the requirement of refilling the vacancy. Owing to the dominance of the "block model", the form of part-time work for older people currently in practice is also far removed from achieving the goals associated with the vision of flexibilisation of working hours with regard to individual, industrial and employment policies.

Ultimately the current arrangement of part-time work for older people has superseded the early retirement practice, demonstrating the fact that businesses can detach themselves from demographic development. The opportunities and limits of

the "generational contract" within a firm, in that for instance older people carry on working while the 40-55-year-olds improve and renew their competencies during their working hours, are not being sufficiently explored. This leads consequently to a stalemate in innovation that impedes the quest for innovative forms of work organisation.

Teamwork spanning the age groups

A special role is attributed to teamwork in terms of product and service quality production as well as increasing productivity (Kröll and Schnauber, 1997), not least due to the MIT study (Womack *et al.*, 1991) and the discussion it has triggered concerning lean production in the field of economics, politics and science (Ortmann, 1995, p. 338 ff.). In scientific debate teamwork is regarded as the modern form of work organisation (Minssen, 1999). The introduction of teamwork is associated with the idea – as maintained by Widmaier and Sauerwein (1996, p. 31) – that teamwork is an ideal instrument with which to harness the hidden potential of members of organisations.

The government assigns teamwork a pre-eminent role with regard to the integration of older workers. In a recent statement from the Federal Ministry of Education and Research on the improvement of inter-generational co-operation it is stated that: "One approach is mixed-age operational and strategic teamwork, which uses the innovative potential of different age groups" (Bundesministerium für Bildung und Forschung, 2000, p. 18).

The introduction of operational and strategic teamwork should contribute to a more appropriate deployment of older workers that does justice to their personal competencies. It is to be hoped that the custom of providing sinecures for older employees shall be abandoned. These have led more to the stigmatisation of older workers than they have achieved in claiming to do justice to the productivity potential of older workers.

"Mixed age" teamwork is viewed as a form of work organisation that is advantageous for both younger and older employees through its "giving and taking" learning system. In the course of everyday life, older people can, for instance, learn new technological skills from younger people while in turn passing on their practical knowledge and experience in teamwork encompassing all areas in a form of collective self-training.

How far older employees profit from teamwork as a "modern" form of work organisation – as proposed by Schreurs

(1996) – is subject to dispute (Kratzer *et al.*, 1998, p. 202 ff.). That older employees automatically become “winners of modernisation” is a matter for further investigation.

Unfortunately research of small groups has not yet provided sufficient theoretical and empirical results to offer an insight into the possibilities and limits of the integration of older workers through teamwork. Consequently, the most effective means of organising such professional teams in order to integrate the older staff members productively (field of deployment, point in time and location) has not yet been established.

Forms of organisation other than operational and strategic teamwork marked the previous industrial conditions under which older staff members were socially conditioned, e.g. assembly line work, separate workstations. These experiences of socialisation and the ensuing patterns of behaviour can prove to be a decisive obstacle for the implementation of teamwork for all age groups or a single age category.

In view of the unresolved questions cited earlier there is the danger of succumbing to an illusion of harmony with regard to the mutual support of the young and the old. This does not however suggest that group dynamics in a working party are marked by a form of “social Darwinism” leading to the exclusion of the older team members.

There is much in the literature and public debate on the subject of teamwork, yet the extent to which teamwork is actually implemented is in contrast relatively low (Minssen, 1997, p. 198 ff.). In his empirical studies based on a panel study in the mechanical engineering sector, Widmaier comes to the conclusion that few of the businesses surveyed employed the structurally innovative form of teamwork (Widmaier and Sauerwein, 1996; Widmaier, 2000). Teamwork spanning the age groups based on the mutual learning model is however to be regarded as a structurally innovative form of teamwork[30].

With a low level of teamwork implementation there is the potential hazard of leading a phantom discussion when debating the subject of “teamwork and older employees”, since this debate is likely to be far removed from the reality of company practice.

Limits to human resource planning for the future

Literature on the subject often gives the impression that problems at company level triggered by demographic transition are to be overcome primarily by means of long-term,

forward-looking human resource planning (Endres, 2000; Rothkirch, 2000). This view is based on a misunderstanding of the efficacy of HR planning. The “social” aspect of company culture comes to the fore in a one-sided manner. Economic or technical considerations (Kröll, 1997a,b) are either ignored entirely, seen as disruptive factors, or with the aid of normative demands or moral categories quickly brushed aside[31]. But even exclusively cost-oriented approaches to HR management reveal deficiencies[32]. Thus commonly in corporate practice the only grounds chosen for the dismissal of personnel, and particularly of older personnel, are the total HR costs and HR ancillary costs that must be reduced (Jochum and Meyer, 1995).

The suggestions that see the key to the further employment of older workers in HR planning for the future are founded on a technocratic understanding of planning. This perception proves deficient according to Mintzberg (1995). It would of course be desirable for economic and social reasons for businesses to fall back on the anticipatory rather than the reactive form of manpower requirements planning. The requirement for proactive HR planning is that the causes of HR overcapacity be prognosticated early and that corrective action be taken.

Yet it is increasingly difficult for innovative businesses which operate in a dynamic environment to predict such changes in the economy, in technology and in society that are relevant from the businesses’ perspective. Thereby certain preconditions for HR planning for the future are simply unavailable. If in industrial practice anticipatory planning is rarely undertaken by HR departments, this cannot simply be explained by “... insufficient awareness of the problems, [and] little methodical planning experience ...” (Drumm, 2000, p. 286). Even if it were possible to implement workforce reduction planning in the spirit of its advocates, small and medium-sized enterprises are not in the position to instigate the necessary planning expenditure. The majority of older workers are in fact employed in just such organisations. Furthermore the HR policies of innovative businesses are distinguished from those of less innovative businesses by the fact that they do not pursue “textbook” style HR planning, regarding this as unimportant for the further development of the organisations.

In 1998, 76.71 per cent of employees over the age of 49 years making social security contributions worked in businesses with 499 or fewer staff members (Federal Employment

Services (Bundesanstalt für Arbeit, 2000). Only 23.28 per cent of the older workforce was employed in businesses with over 500 staff (see Figure 5).

Owing to their limited financial means, SMEs cannot afford costly compensation programmes[33]. In large businesses it is more feasible to transfer staff members within the organisation and delegate them with new responsibilities. This could also be a reason why employees over 49 years of age are proportionally under-represented in organisations employing between 3-49 staff.

Since the dynamics and complexity of the environment are increasing (key words: shorter product life cycle, technological development and globalisation), avoidance of personnel overcapacity through HR planning for the future is progressively more difficult[34]. For the aforementioned reasons it is advisable to seek a third way: from the reactive and anticipatory to the creative adaptation of staffing levels[35]. This assumes that alongside exchange of personnel (especially specialists and executive staff), surmounting the obstacle of obsolete competencies and simultaneously acquiring new competencies is a necessary component of innovation. The exchange of personnel connected to structural change and the implementation of innovations, or the new placement of staff members, should not automatically lead to a long phase of

unemployment among employees aged 55 years and above. For this reason mechanisms must be developed and installed which promote and enable the rotation/transfer of jobs in order that this change does not become an incalculable risk for the employees concerned. Herein lies a challenge both for the businesses and the parties negotiating the wage agreements.

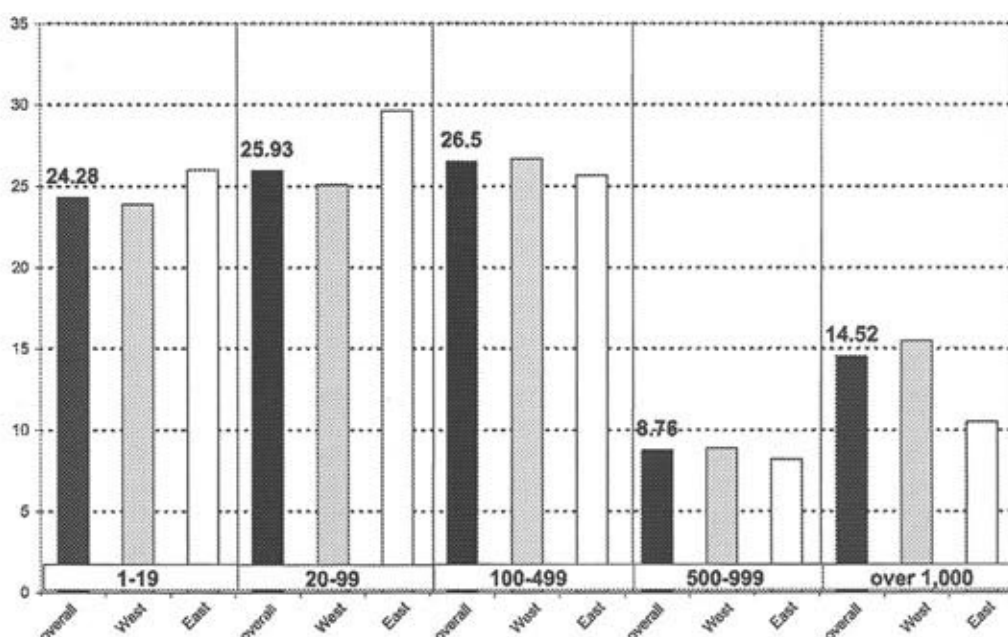
Advanced vocational training and competency development

Through the previously cited arguments it is clear that competency development holds a key role in the issues arising from the further employment of older employees. But it is necessary to point out deficits and misunderstandings ensuing from this course of action.

Owing to the current data from the reporting system on vocational training it is immediately clear that older people in general participate less in further educational activities than younger people (Kuwan *et al.*, 2000, p. 98). But the data should be interpreted: it must be clarified that the report system data refer to all persons and not only those in employment (Koller and Plath, 2000, p. 114). The employment rate is however lower for older than for younger age groups.

It appears that there are factors other than age affecting the readiness to participate in vocational training programmes and the

Figure 5
 Proportion of employees aged over 49 years categorised according to organisation size



Source: Author's calculations; data from IAB

participation level itself. Older people regard the statement that "further professional training improves their individual career opportunities" with considerably more scepticism, according to empirical findings of the DIW (Behringer, 2000a, p. 555 ff.). Yet older workers in particular have a vested interest in the competencies to be displayed being distinguished by a high utilisable value, since their remaining length of service in organisations is shorter than that of the younger staff members. The lower participation rate of older people can also be traced back to the belief that some of the professional training measures on offer do not meet or have not met these requirements.

A total of 50 per cent of advanced training takes place – following the results of research by Behringer (2000a) – in companies, on an on-the-job basis. The remaining period of employment, and thus the remaining time in which to "use" in the organisation, is assumed to be shorter, and consequently the readiness of businesses to promote training initiatives for their employees tends to diminish the older the employee. When older employees seek training, it is increasingly unlikely that employers will allow this to take place during working hours.

There is then little truth in the common prejudice that a general reluctance to engage in training is characteristic of older people. It can certainly not be called upon as a legitimate basis on which to justify hindering older people's competency development.

The vocational training measures on offer for older workers are deficient from a qualitative rather than a quantitative perspective. A large proportion of the available training measures are not, for instance, suited to older people's learning needs and behavioural patterns of learning.

Current vocational training programmes take into account the heterogeneity of the older participants arising from different careers and individually accumulated practical knowledge only to a very limited extent. Forms of organisational learning specific to particular age groups and methodological and didactic learning strategies are not systematically employed, while contact with older employees is hardly ever made an issue even in the training programmes for trainers. It can be said without exaggeration that the present variety of vocational training measures on offer implicitly and unintentionally leads to the exclusion of older staff members.

It is more or less clear to every person with practical experience that his/her knowledge gained through experience, that is, his/her competencies that are put to use daily were

in fact acquired in practice, the location of learning being the workplace, and not school-like classes of higher and further education providing unbalanced theoretical information (Staudt, 1997). If the bulk of professional competencies and their further cultivation arise from practical experience, then this insight must be considered in the work organisational institutionalisation of industrial and occupational competency development. Appropriate forms of occupational competency development are those which place learning in the work process in the foreground, such as job rotation, job enrichment, job enlargement, and operational and strategic teamwork in the sense of collective self-training as well as project-oriented work.

These forms of competency development of particular interest to the employees constitute then a challenge to the organisational competence of the managerial staff. The managerial staff play a key role in enabling the competency development of older employees through measures such as redesigning tasks and thus creating the appropriate basic organisational conditions. But as a rule they are not prepared for these new responsibilities and are furthermore offered no incentives for such an undertaking. Since they generally possess such organisational competencies and skills only to a limited degree, they can become "bottlenecks" for the further employment of older employees.

Competency development cannot succeed without the employees' own initiative. Staff members who undertake vocational training measures to improve their qualifications take a step forward in providing for their future. The issue is not about "schooling" every employee, but rather about establishing the organisational requirements to promote and utilise the self-organisational potential of employees in professional competency development. For instance, employees can be given sufficient opportunity to enhance their qualifications by means of a flexible structuring of working hours. Remuneration systems can provide incentives for competency development on the individual's own initiative, and through effective redistribution of tasks newly acquired skills can be applied[36].

Once the time-lag of the effect of external activities such as competency development is taken into consideration, not only the 55-year-olds and above but also the 35-55-year-olds must be included in the full reflection of the questions in hand. The effective preparation of 35-55-year-olds for them to remain in employment after the age of 55 years thus emerges as an urgent problem.

Conclusion

Demographic change has traditionally been ignored as a determining factor in human resource policies, even with the increasing urgency of the prospect of an ageing workforce. Companies cannot influence the fact that the population is ageing rapidly, yet the problematic implications can be lessened through the implementation of policy initiatives at national and company level aimed at retaining healthier workers in a strengthened internal and external labour market. Strategies to ensure the transfer of knowledge and competencies across generations of employees are a minimal requirement, while an urgent first step is raising the awareness of this issue among the major actors in the labour market.

Human resource management of an ageing workforce is primarily the concern of private and public employers, yet it is apparent that attempts to reverse the trend towards early retirement are much more likely to achieve long-term success when integrated, holistic strategies are carried out with the full commitment of all social partners, public authorities, and the older workers themselves, and which take companies of all sizes into account. Good practice at company level in managing older workers can ultimately be futile if push factors emanating from the state, trade unions and employers' organisations provide incentives significant enough to make further employment financially unprofitable, and if the welfare state culture entrenches an assumption of the right to early retirement in the national consciousness. The same goes for supply side measures on the part of the state: increasing the official retirement age without stimulating demand for older employees and improving ergonomic, health and safety standards in the workplace can have negative consequences for unemployed and unskilled workers, in that they may be forced to remain on the job market.

The guarantee of adequate returns on investment in human capital, the avoidance of shortages of skilled workers, and the enhancement of the diversity of the workforce for maximum employment potential are just a few of the clear pragmatic and economic arguments in favour of the further employment of workers in the older age category (Walker, 2002, p. 27). Building on these ideas, Finland is a pioneer nation in its government-led, publicly financed workplace health and safety schemes (see Ilmarinen, 1997, pp. 3-5). The prevention of age-related problems, such as workplace injuries and outdated skills, as well as a holistic approach

to maintain and improve health promotion activities are statutory elements of HRM in Finnish companies. In 1999 the workplace health promotion was developed into an integrated model, whereby workplace health promotion measures are an integral part of organisational management, human resource development and the business environment.

There are many other exemplary age management practices in companies around the world to be noted for a benchmarking approach. All operating units in Chevron carry out a demographic analysis each year to ascertain the areas likely to suffer from skill shortages. To reinforce competencies, the entrance age for executive programmes has been lowered. Companies such as IBM and American Express offer eldercare centres, just as some companies provide childcare facilities (Baltzell, 2000, p. 6).

Several "futurists" have attempted to predict the shape of our working lives in generations to come. In view of the demographic changes in our society, the critical question now is not if and when work, as we know it, will come to an end, but who is going to be doing it, and whether or not they are capable of facing the great challenges ahead.

Notes

- 1 Japan's population is ageing even faster than the other industrial nations (*VDI-Nachrichten* (*VDI-News* (2001))).
- 2 As stated by the Institute for Employment Research (IAB), the potential labour force is composed of the combined forces of the employed, officially unemployed and the inactive reserves. For the conception and calculations procedure underlying the IAB's findings, see among others Fuchs' (1998) contribution.
- 3 Under the terms of the agreement between the Federal Government and trade unions for the IT and communication sectors, up to 20,000 IT specialists can receive a work permit valid for up to five years. Between August 2000 and the end of January 2001 around 5,000 work permits were issued to foreign IT specialists (source: ZAV, The Federal Employment Service's Central Agency for Work Placement in Bonn). The majority of the workers came from India (approximately 1,000), followed by the former Soviet Union and Romania. Even when taking into account the fact that the international IT labour market cannot be compared with the international labour market for other highly qualified specialist and executive staff, the figures are nevertheless sobering.
- 4 In order to illustrate how Germany's potential labour force could develop over the next few

- years, Fuchs and Thon (1999) have produced various projections with the aid of different figures for immigration.
- 5 In the course of this development there is likely to be ever greater vehemence in the demand for "tidying-up" traineeships and course contents to reduce the time in which a qualification is obtained, or to cut ineffective training measures (*VDI-Nachrichten*, 2001).
 - 6 It must also be taken into consideration that the comparison between the countries is not unproblematic. Nevertheless, the differences are so great that one can discern a clear trend.
 - 7 Scharpf (2000) reaches the conclusion that as long as it is financed largely by taxation, an extensive social security system will not damage a country's competitiveness.
 - 8 Businesses employ staff on the assumption that they possess certain skills needed in the business to carry out particular tasks.
 - 9 In connection I refer to a publication by Blaschke and Plath (2000, p. 462) in which they indicate the difficulties of gaining an insight into the "... dynamics and functional mechanisms of the movements on the labour market and the possibilities of intervening through labour market policies ... [with the aid of] existing data".
 - 10 See Verband der Rentenzuwendungsträger (Association of Pension Distribution Institutions).
 - 11 In both the Wage Earners' Pension Insurance and in the Salaried Employees' Pension Insurance schemes only a minority now withdraw from professional life beyond the normal age for entitlement to retirement benefits (65 years).
 - 12 The most recent figures from the Federal Employment Services identify the following employment rate for 50-55-year-olds: 91 per cent in Western Germany, 93 per cent in Eastern Germany; for 55-60-year-olds: 78.6 per cent in the West, 83.3 per cent in the East; for the 60-65-year-olds: 33.7 per cent in the West and 21.4 per cent in the East (source: Institute for Employment Research (2001)).
 - 13 The statistics apply to 1998 (OECD).
 - 14 Professional activities carried out by the labour force decisively influence the productivity of older workers. This finding suggests that those responsible for human resources have a key role in the further employment of older people.
 - 15 This is of primary relevance for new forms of work organisation which lead to lower levels of physical strain for the employees than those attributable to the Taylorist production regime (see among others Frerichs, 1998, p. 180ff.; Kratzer *et al.*, 1998, p. 203).
 - 16 Poorly qualified older people are even more severely affected by unemployment.
 - 17 The following data are based on the findings of the Federal Employment Services in Bonn.
 - 18 According to experts of labour market research, statistics from the Federal Employment Services prove deficient since as a rule they lag behind current developments on the labour market. Their statistics offer no information about the labour market for biotechnology because of the lack of relevant data collection categories. Nevertheless the development of this market segment is of particular interest from the point of view of structural changes on the labour market.
 - 19 In the field of management, metaphors play a pre-eminent role (Schlee and Kieser, 2000).
 - 20 These statements are not to be confused with the thesis of the growing divide between productivity and labour costs demonstrated by Frerichs (1998, p. 46).
 - 21 Due to the present lack of adequate selection criteria, a legitimate basis for such decisions is problematic.
 - 22 Furthermore, incentive systems must be adapted to suit the prevailing form of work organisation into which older workers are integrated. This also applies to remuneration in the context of the various forms of teamwork for all employee age groups or for a single age category.
 - 23 As a rule external courses of further education/training do not achieve the desired effect. Of greater interest are competency developing activities oriented towards the specific tasks of the workplace and geared to the individual needs of the employees.
 - 24 It is clear in this context that, for instance, the restructuring of part-time work for older people has led to its common implementation. It is, however, questionable whether the original intention of enabling a phased transition into retirement has been achieved.
 - 25 For example, as long ago as 1975 the German Trade Union Federation developed a programme for older employees (DGB, 1975, *Programme for Older Workers*).
 - 26 For more on the question of approaches which favour "one best way" solutions see Ortmann (1995).
 - 27 In the past, big businesses designed concepts for part-time work for older people with this aim in mind, which for the most part could not be implemented in industrial practice. Prime impediments were said to be the financial forfeits (Frerichs *et al.*, 1997, p. 110 ff.) and the additional organisational costs.
 - 28 Collective agreements allow for sponsorship of part-time work for older people for up to ten years (e.g. in the metal industry). Should employees take advantage of this sponsorship scheme, they consequently work between the age of 55-60 years and are released from work when aged 60-65 years, during which time such persons will be or are currently registered in the Federal Employment Service's statistics as gainfully employed.
 - 29 This corresponds with the findings of the experts at the Institute for Employment Research (Ellguth and Koller, 2000).

- 30 For the difference between structurally innovative and structurally conversant teamwork see also Tullius (1999).
- 31 This extreme position can be interpreted as a reaction to the previous practice of dealing with reorganisation. Changes in organisational and human resource structures were generally treated as technical innovations (Minssen, 1997, p. 208), with the effect that the corresponding efforts failed not infrequently.
- 32 The approaches in question are constrained because ultimately it is not costs that can be managed but activities which contribute to net product, and cause planned or unplanned costs.
- 33 Works councils and trade unions consider the prevailing practice of compensation if not in need of wholesale revision, then requiring improvement. They therefore advocate that part of the funds for compensation be used for actively shaping the future career paths of employees – such as for example outplacement and new placement consultation.
- 34 It is necessary to indicate that the author is not putting forward a theoretical contingency approach and nor is he falling back upon the concept of an environmental determinism between environment and system.
- 35 Creative adaptation of staffing levels comprises outplacement and new placement activities (Hartmann, 1997).
- 36 The author is aware that he is proposing an ideal state of affairs not or not yet to be found in practice.

References

- Baltzell, B. (2000), "Implications of an ageing population. The changing future profiles of the workforce in international organisations", Fulbright Symposium, Perth, available at: www.alcoa.com.au/news/speeches/BMBFulbrightspeech.html
- Behringer, F. (2000a), "Berufliche Weiterbildung älterer Arbeitnehmerinnen und Arbeitnehmer" ("Vocational training of older employees"), in Matzdorf, R. et al. (Eds), *Weiterbildung für Erwachsene mit geringen Qualifikationen und für ältere Arbeitnehmerinnen und Arbeitnehmer (Training for Adults with Low Qualifications and for Older Employees)*, Bonn, pp. 550-66.
- BGB (2000), *Gesetz zur Fortentwicklung der Altersteilzeit (2nd Act on Further Development of Part-time work for Older People)*, p. 910.
- BGBI (2000), *Gesetz zur Fortentwicklung der Altersteilzeitgesetz (Further Development of Part-time work for Older People Act)*, p. 29494.
- Blaschke, D. and Plath, H.-E. (2000), "Möglichkeiten und Grenzen des Erkenntnisgewinns durch Evaluation aktiver Arbeitsmarktpolitik" ("The opportunities and limits of acquiring an insight through an evaluation of active labour market policies"), *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung (Reports from the Labour Market and Employment Research)*, Vol. 33 No. 3, pp. 462-82.
- Blöndal, S. and Scarpetta, St. (1999), "The retirement decision in OECD countries", Economics Department – Working Paper, No. 202, Paris.
- Bullinger, H.-J. and Enderlein, H. (Eds) (1996), *Betriebliche Folgen veränderter Altersstrukturen in der Montage (Industrial Consequences of Changed Age Structures in the Assembly Process)*, Chemnitz-Zwickau.
- Bundesanstalt für Arbeit (2000), *Beschäftigtenstatistik (Employment Statistics)*, Nürnberg.
- Bundesinstitut für Berufsbildung (1999), "Ältere Mitarbeiter und Mitarbeiterinnen ("Older workers")", *Referenz-Betriebs-System*, Information No. 14, Vol. 5.
- Bundesministerium für Bildung und Forschung (2000), *Wie sieht Arbeit in Zukunft aus? Innovative Arbeitsgestaltung – Zukunft der Arbeit (What Will Work Be Like in the Future? Innovative Structuring of Work – The Future of Work)*, Berlin.
- DGB (Deutscher Gewerkschaftsbund) (1975), *Programm des deutschen Gewerkschaftsbundes für ältere Arbeitnehmer (Federation of Trade Unions' Programme for Older Employees)*, Düsseldorf.
- Döhl, V. (2000), "Flexibilisierung von Arbeit und Beschäftigung – Chancen für Ältere" ("Flexibilisation of work and employment – chances for older people"), in v. Rothkirch, Ch. (Ed.), *Altern und Arbeit (Aging and Work)*, Berlin, pp. 129-34.
- Drumm, H.J. (2000), *Personalwirtschaftslehre (Human Resource Management)*, Vol. 4, Berlin-Heidelberg-New York, NY.
- Ellguth, P. and Koller, B. (2000), "Arbeitsmarktentlastung durch Altersteilzeit" ("Relieving the strain on the labour market through part-time work for older people"), *IAB-Materialien*, No. 1, pp. 4-5.
- Endres, G.L. (2000), "Demographischer Wandel und betriebliche Altersstrukturen" ("Demographic transition and companies' age structures"), *Zeitschrift Personalführung (Journal of Human Resource Leadership)*, Vol. 2, pp. 48-51.
- Frerichs, F. (1998), *Älterwerden im Betrieb. Beschäftigungschancen und Risiken im demographischen Wandel (Maturing in Business. Employment Chances and Risks in Demographic Transition)*, Opladen-Wiesbaden.
- Frerichs, F., Michel, M., Naegele, G., Peter, G. and Sczesny, C. (1997), *Bewältigung des Demographischen Wandels in Nordrhein-Westfalen (Overcoming Demographic Transition in North Rhein-Westphalia)*, Münster.
- Fuchs, J. (1998), "Das IAB-Erwerbspotential. Konzept und

- Berechnungsweise" ("The concept and calculations of the Federal Employment Services"), in INIFES, ISF, SÖSTRA (Eds), *Erwerbsarbeit und Erwerbsbevölkerung im Wandel (Gainful Employment and the Labour Force in Transition)*, Frankfurt a. M., New York, NY, pp. 111-41.
- Fuchs, J. and Thon, M. (1999), "Potentialprojektion bis 2040. Nach 2010 sinkt das Angebot an Arbeitskräften" ("Projected potential until 2040. After 2010 the labour supply declines"), *IAB-Kurzbericht*, No. 4.
- Hacker, W. (Ed.) (1996), *Erwerbsarbeit der Zukunft – Auch für 'Ältere'? (Gainful Employment of the Future – Even for Older People?)*, Zürich-Stuttgart.
- Hartmann, F. (1997), "Outplacement-Beratung. Beratung zur beruflichen Neuorientierung" ("Outplacement advice. Advice for professional reorientation", in von Hans-Böckler-Stiftung (Ed.), *Manuskripte 221*, Düsseldorf.
- Ilmarinen, J. (1997), "Ageing and work – coping with strengths and weaknesses", *Scandinavian Journal of Work, Environment and Health*, pp. 3-5.
- Jochum, E. and Meyer, M. (1995), "Evaluation eines Personalfreisetzungsprogramms" ("Evaluation of a HR redundancy programme"), in Gerpott, T.J. and Siemers, H. (Eds), *Controlling von Personalprogrammen (Evaluating Human Resource Programmes)*, Stuttgart, pp. 253-302.
- Kistler, E. (2000), "Entwicklung und Perspektiven des Angebotsüberhangs am Arbeitsmarkt" ("Development of and perspectives on the labour market's supply surplus"), in v. Rothkirch, Ch. (Ed.), *Altern und Arbeit (Ageing and Work)*, Berlin, pp. 102-26.
- Klammer, U. and Weber, H. (2001), "Flexibel in den Ruhestand? – Ergebnisse und Überlegungen zur Altersteilzeit" ("Flexibility into retirement – results and considerations of part-time work for older people"), *WSI Mitteilungen*, Vol. 2, pp. 102-12.
- Klöß, H.-P. (2000), "Ältere Arbeitnehmer: Entwicklungstrends und beschäftigungspolitischer Reformbedarf" ("Older employees: trends in development and the need for reform of employment policies"), *IW-Trends*, Vol. 27 No. 2.
- Koller, B. and Plath, H.-E. (2000), "Qualifikation und Qualifizierung älterer Arbeitnehmer" ("Development and the qualifications of older employees"), *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung (Reports from Labour Market and Employment Research)*, Vol. 33 No. 1, pp. 112-25.
- Kratzer, N., Döhl, V. and Sauer, D. (1998), "Entgrenzung von Arbeit und demographischer Wandel" ("Removing the borders of work and demographic transition"), in INIFES, ISF, SÖSTRA (Eds), *Erwerbsarbeit und Erwerbsbevölkerung im Wandel (Gainful Employment and the Labour Force in Transition)*, Frankfurt a. M., New York, NY, pp. 177-210.
- Kröll, M. (1997a), "Alterung des naturwissenschaftlich-technischen Personals gefährdet Innovationsfähigkeit von Unternehmen" ("The ageing of scientific-technical personnel endangers companies' capacities for innovation"), *Angewandte Arbeitswissenschaft (Applied Industrial Sciences)*, pp. 18-35.
- Kröll, M. (1997b), "Integrative concept for technical, personnel and organisational development for professional skill enhancement", *Journal of European Industrial Training*, Vol. 21 No. 2-3, pp. 70-83.
- Kröll, M. and Schnauber, H. (Eds) (1997), *Lernen der Organisation durch Gruppen- und Teamarbeit (Learning in Organisations Through Operational and Strategic Teamwork)*, Heidelberg-Berlin.
- Kühl, St. (2000), "Grenzen der Vermarktlichung" ("Limits to commercialisation"), *WSI-Mitteilungen*, Vol. 12, pp. 818-28.
- Kuwan, H., Gnahn, D. and Seidel, S. (2000), *Berichtssystem Weiterbildung*, Vol. 7, Bonn.
- Minssen, H. (1997), "Gruppenarbeit in der Fertigung – Probleme eines zukunftsorientierten Konzepts" ("Teamwork in production – the problems concerning a future-orientated concept"), in Kröll, M. and Schnauber, H. (Eds), *Lernen der Organisation durch Gruppen- und Teamarbeit (Learning in Organisations Through Operational and Strategic Teamwork)*, Heidelberg-Berlin, pp. 195-235.
- Minssen, H. (1999), *Von der Hierarchie zum Diskurs? (From Hierarchy to Discourse?)*, München-Mering.
- Mintzberg, H. (1995), *Die Strategische Planung (Strategic Planning)*, Vienna and London.
- Nikitina, S.V. (2000), "Population decline and population ageing in the Russian Federation", working paper, Population Division – United Nations Secretariat, UN/POP/PRA/13, New York, NY.
- Ortmann, G. (1995), *Formen der Produktion. Organisation und Rekursivität (Forms of Production, Organisation and Recursivity)*, Opladen.
- Pongratz, H.J. and Voß, G.G. (2000), "Vom Arbeitnehmer zum Arbeitskraftunternehmer" ("From employee to labour force entrepreneur"), in Minssen, H. (Ed.), *Begrenzte Entgrenzungen (Boundaries to Border Removal)*, Berlin, pp. 225-47.
- Rothkirch, Ch. v. (Ed.) (2000), *Altern und Arbeit (Ageing and Work)*, Berlin.
- Scharpf, F.W. (2000), "Der globale Sozialstaat" ("The global welfare state"), *Die Zeit*, Vol. 8 No. 6.
- Schlee, A. and Kieser, A. (2000), "Die Konstruktion von Organisationen mithilfe von Metaphern" ("The construction of organisations through metaphors"), in Hehl, P.M. and Stahl, H.K.

- (Eds), *Management und Wirklichkeit (Management and Reality)*, Heidelberg.
- Schreurs, M. (1996), "Ansätze der Personalplanung und Entwicklung älterer Arbeitnehmer" ("Approaches to the human resource planning and development of older employees"), in Frerichs, F. (Ed.), *Ältere Arbeitnehmer im Demographischen Wandel (Older Employees in Demographic Transition)*, Münster, pp. 117-22.
- Schulz, E. (2000), "Migration und Arbeitskräfteangebot in Deutschland bis 2050" ("Migration and supply in Germany up to 2050"), *DIW-Wochenbericht*, Vol. 48, Berlin.
- Staudt, E. (1997), "Zurück in den Alltag. Kompetenzentwicklung und Bildungspolitik jenseits des Taylorismus" ("Back to reality. Competency development and education policies beyond Taylorism"), *QUEM-Report*, No. 50, Berlin, pp. 19-40.
- Tullius, K. (1999), "Dezentralisierung, Vermarktlichung und diskursive Koordinierung" ("Decentralisation, commercialisation and discursive co-ordination"), *Sofi-Mitteilungen*, No. 27, Göttingen, pp. 65-82.
- United Nations (2000), *Replacement Migration: Is It A Solution to Declining and Ageing Populations?*, United Nations, New York, NY.
- Verband angestellter Akademiker und leitender Angestellter der chemischen Industrie (2000), *Altersteilzeitarbeitsverhältnisse im AT-Bereich (Conditions of Part-Time Work in the IT Sector)*, Köln.
- VDI-Nachrichten (VDI News)* (2001), No. 2, 12 January, p. 5.
- Walker, A. (1997), *Combating Age Barriers in Employment – European Research Report*, Office for Official Publications of the European Communities, Luxembourg.
- Walker, A. (2002), "Active strategies for older workers in the UK", in Foden, D., Jepsen, M. and Hutsebaut, M. (Eds), *Active Strategies for Older Workers*, Brussels.
- Walker, A. and Maltby, T. (1997), *Ageing Europe*, Open University Press, Buckingham.
- Walker, A. and Taylor, P. (1998), *Combating Age Barriers in Employment – A European Portfolio of Good Practice*, Office for Official Publications of the European Communities, Luxembourg.
- Widmaier, U. (Ed.) (2000), *Der deutsche Maschinenbau in den neunziger Jahren. Kontinuität und Wandel einer Branche (Germany's Mechanical Engineering in the Nineties. Continuity and Transition in the Industry)*, Frankfurt, New York, NY.
- Widmaier, U. and Sauerwein, R.G. (1996), "Warum es nicht wie geschmiert läuft: Zum Problem der Diffusion von Gruppenarbeit im Maschinenbau" ("Why it doesn't run like clockwork: the problems of the diffusion of teamwork in mechanical engineering"), in Zimolong, B. (Ed.), *Kooperationsnetze, flexible Fertigungsstrukturen und Gruppenarbeit (Co-operation Networks, Flexible Structures of Production and Teamwork)*, Opladen, pp. 31-54.
- Womack, J.P., Jones, D.T. and Roos, D. (1991), *The Machine that Changed the World: How Japan's Secret Weapon in the Global Auto Wars will Revolutionize Western Industry*, HarperCollins, New York, NY.

Further reading

- Bauerhaus, P., Staiger, D.O. and Auerbach, D.I. (2000), "Implications of an ageing registered nurse workforce", *Journal of the American Medical Association*, Vol. 283 S. 2, pp. 948-2.
- Behringer, F. (2000b), "Die berufliche Situation älterer Erwerbstätiger und ihre Entwicklung im letzten Jahrzehnt" ("The professional situation of older workers and progression over the last decade"), in George, R. and Struck, O. (Eds), *Generationsaustausch im Unternehmen (The Generational Exchange in Companies)*, München, pp. 89-112.
- Bosch, G. (2000), "Arbeitszeit, Arbeitsorganisation und Qualifikation" ("Working hours, work organisation and development"), *Zeitschrift für Personalführung (Journal of Human Resource Management)*, Vol. 10, pp. 52-60.
- Delson, L. and Reday Mulvey, G. (1996), *Gradual Retirement in the OECD Countries*, Dartmouth Press, London.
- de Vroom, B. and Guillemard, A.M. (2002), "From externalisation to integration of older workers: institutional changes at the end of the worklife", in Andersen, J.G. and Jensen, P.H. (Eds), *Changing Labour Markets, Welfare Policies and Citizenship*, The Policy Press, Bristol.
- Drury, E. (1995), *Older Workers and Labour Market Programmes and Policies in the European Union*, European Foundation for the Improvement of Working and Living Conditions, Dublin.
- Foden, D. and Jepsen, M. (2002), "Active strategies for older workers in the European Union. A comparative analysis of recent experiences", in Foden, D., Jepsen, M. and Hutsebaut, M. (Eds), *Active Strategies for Older Workers*, Brussels.
- Fritsch, St. (1996), "Aktivierung des Potentials älterer Mitarbeiter" ("Activating the potential of older workers"), *Personal (Personnel)*, pp. 130-2.
- Griffiths, J. (Ed.) (1996), *Business and Social Exclusion – A Guide to Good Practice*, British Telecom, London.
- Hornstein, Z. (2001), *Age Discrimination Legislation: Choices for the UK*, Joseph Rowntree Foundation, York.
- Iilmarinen, J. (2000), "Die Arbeitsfähigkeit kann mit dem Alter steigen" ("Productivity can increase with age"), in v. Rothkirch, Ch. (Ed.), *Altern und Arbeit (Ageing and Work)*, Berlin, pp. 88-99.
- Kisner, S.M. and Pratt, S.G. (1997), "Occupational fatalities among older workers in the United States: 1980-1991", *Journal of Occupational and Environmental Medicine*, Vol. 39 No. 8, pp. 715-21.

- Koller, B. (1999), "Ältere – eine Manövriermasse des Arbeitsmarktes?" ("Older people – the manoeuvrable masses of the labour market?"), in Wiedemann, E. et al. (Eds), *Die arbeitsmarkt- und beschäftigungspolitische Herausforderung in Ostdeutschland. Nürnberg (The Challenge for Labour Market and Employment Policies in Eastern Germany)*, pp. 227-46.
- Kröll, M. and Brinkmann, A. (1999), "Strukturwandel und Innovationen als Herausforderungen für die (Weiter-) Beschäftigung von älteren Arbeitnehmern" ("Structural change and innovations as a challenge for the further employment of older people"), *WSI-Mitteilungen*, Vol. 52, pp. 273-85.
- Kruse, A. (2000), "Psychologische Beiträge zur Leistungsfähigkeit im mittleren und höheren Erwachsenenalter" ("Psychological contributions to efficiency in middle and old age"), in v. Rothkirch, Ch. (Ed.), *Altern und Arbeit (Ageing and Work)*, Berlin, pp. 72-87.
- Minssen, H. (Ed.), *Begrenzte Entgrenzungen (Delimited Border Removal)*, Berlin.
- OECD (1999), *Employment Outlook*, OECD, Paris.
- Patrickson, M. (2001), "Asia's ageing workforce: the emerging challenge for the twentieth century", *International Journal of Organisational Behaviour*, Vol. 3 No. 1, pp. 53-63.
- Plath, H.E. (2000), "Erfahrungswissen – Das habe ich halt so im Gefühl" ("Knowledge gained through experience"), *IAB-Materialien*, No. 1, pp. 8-9.
- Ploughmann, P. (2002), "Internationalisation and the labour market of the European Union", in Andersen, J.G. and Jensen, P.H. (Eds), *Changing Labour Markets, Welfare Policies and Citizenship*, The Policy Press, Bristol.
- Scherer, P. (2002), *Age of Withdrawal from the Labour Force in OECD Countries*, OECD Labour Market and Social Policy, Occasional Papers, No. 49, OECD, Paris.
- Voß, G.G. and Pongratz, H.J. (1998), "Der Arbeitskraftunternehmer – Eine neue Form der Grundform Arbeitskraft?" ("The labour force entrepreneur – a new form of the basic form of working capacity"), *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, Vol. 50 No. 1, pp. 131-58.
- Walker, A. (2000), *Managing an Ageing Workforce: A Guide to Good Practice*, European Foundation for the Improvement of Living and Working Conditions, Dublin.
- Zentralstelle für Arbeitsvermittlung der Bundesanstalt für Arbeit (Ed.) (2000), *Arbeitsmarkt-Information. Bauingenieurinnen und Bauingenieure (Labour Market Information. Civil Engineers)*, Frankfurt a. M.