

Working time: Research and development

1995 - 1997

Industrial relations & industrial change

Employment & social affairs



European Commission

Working time: Research and development

1995 - 1997

A review of literature (1995 – 1997) commissioned
by the European Commission and the European Foundation
for the Improvement of Living
and Working Conditions

Employment & social affairs

Industrial relations and industrial change

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Corrigenda

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Executive Summary

The first two paragraphs should be read as follows:

"Executive Summary

This report is intended to pinpoint the main lessons that can be drawn from experiments to adapt or reduce working time through an analysis of a set of studies on working time commissioned by the European Commission and the European Foundation in Dublin between 1995 and 1997. These studies cover a very wide range of topics, making it very difficult to provide a summary. The fact that there was so much non-comparable material made it necessary for us to select documents for analysis and to focus our attention chiefly on the employment dimension of the problems raised by working time.

Part I of the report analyses the impact of a general reduction of working time on employment through a critical review of macro-economic simulations conducted on behalf of the Commission. These simulations show that a macro-economic approach has both strengths and weaknesses. Among these strengths, the possibility of modelling separate sets of scenarios makes it possible to assess the sensitivity of results to the hypotheses adopted. These macro-economic simulations highlight, in particular, the importance of the methods by which working time policies are implemented (in particular levels of wage compensation and the impact of reduced working time on capital operating time) and their consequences on the efficiency of policies to reduce working time from the point of view of employment and economic growth.

However, the lack of information on the micro-economic foundations of the adjustment mechanisms at play and the rudimentary nature or even lack of specific empirical evidence on, for instance, the impact of working time reduction on labour supply, the wage bargaining system, enterprise recruitment strategies, etc., obviously represents a weakness. The level to which the models are aggregated seems greatly to simplify the micro-economic behaviour of economic actors (enterprises, workers, social partners): these models take only very insufficient account of certain adjustment mechanisms that could substantially diminish the positive effects expected from job sharing policies. In general, analysis of the macro-economic consequences of a reduction of working time makes it necessary to formulate hypotheses exogenous to the model in relation to basic variables such as levels of wage compensation, productivity gains achieved and capital operating time. In this context, a critical analysis of the validity of the hypotheses adopted would tend to show that findings in terms of employment and unemployment are undoubtedly over-estimated."

Point 4.1.4:

The first sentence of the last paragraph should read as follows:

"It is also interesting to note that most of the collective reductions of working time over the last ten years have taken place in Germany and the Netherlands where the average income level is relatively high and the dispersion of income distribution is relatively low."

Executive Summary

This report is intended to pinpoint the main lessons that can be drawn from experiments to adapt or reduce working time through an analysis of a set of studies on working time commissioned by the European Commission and the European Foundation in Dublin between 1995 and 1997. These studies cover a very wide range of topics, making it very difficult to provide a summary. The fact that the material was so rich and diverse made it necessary for us to select documents for analysis and to focus our attention chiefly on the employment dimension of the problems raised by working time.

Part I of the report analyses the impact of a general reduction of working time on employment through a critical review of macro-economic simulations conducted on behalf of the Commission. These simulations show that a macro-economic approach has both strengths and weaknesses. Among these strengths, the possibility of modelling separate sets of scenarios makes it possible to assess whether results are in keeping with the hypotheses adopted. These macro-economic simulations highlight, in particular, the importance of the methods by which working time policies are implemented (in particular levels of wage compensation and the impact of reduced working time on equipment use times) and their consequences on the efficiency of policies to reduce working time from the point of view of employment and economic growth. However, the lack of information on the micro-economic foundations of the adaptation mechanisms implemented and the rudimentary nature or even lack of specific reports reflecting, for instance, labour supply practices, national methods of employee training, enterprise recruitment strategies, etc., obviously represents a weakness. The level to which the models are aggregated seems greatly to simplify the micro-economic practices of economic operators (enterprises, workers, social partners); these models take only very insufficient account of certain adaptation mechanisms that could substantially diminish the positive effects expected from job sharing policies. In general, analysis of the macro-economic consequences of a reduction of working time makes it necessary to formulate hypotheses external to the model in relation to basic variables such as levels of wage compensation, productivity gains achieved and equipment use times. In this context, a critical analysis of the validity of the hypotheses adopted would tend to show that findings in terms of employment and unemployment are undoubtedly over-estimated.

In the case of the micro-economic approach (Part II of the report), the traditional optimisation models show that a reduction of working time may, under certain conditions, have positive effects on employment. Impact on the volume of workers depends on four types of factor: the extent of adaptation costs and the degree of homogeneity of the labour force, the possibilities for substitution between men and working time and between capital and labour, the impact of a

reduction of working time on equipment use times and lastly levels of wage compensation. These studies rightly show, however, that while favourable effects on employment may be positive in theory, the job sharing effect is based on very restrictive conditions which are very unlikely to be satisfied at sectoral or macro-economic level.

The micro-economic and monographic approach is obviously of interest since it makes it possible to identify a certain number of circumstantial factors that shape the job sharing effect of a reduction of working time. These studies confirm, in particular, the importance of the methods by which a reduction of working time is implemented and the importance of negotiation processes and the behaviour of economic operators. The micro-economic approach highlights, moreover, the important part that processes to reorganise production methods and to adapt working hours play in the impact of a reduction of working time on employment. The authors of the various reports put forward, on the bases of case studies, convincing arguments about the conditions that are needed for a policy to reduce/adapt working time to have a positive effect on employment and on the competitiveness of enterprises. While these field studies would seem to point to positive effects on employment and competitiveness at enterprise level, it is questionable whether these favourable cases can be transferred to and reproduced in other enterprises, sectors or even other Member States (especially when the institutional set-up in these Member States means that negotiated compromises are harder to obtain). The fact that the enterprise samples selected are not very representative should encourage readers not to be tempted to generalise the sometimes beneficial effects of a reduction of working time on employment to the economy as a whole.

The various studies analysed in this report also confirm that, in order to have a favourable effect on employment, a reduction of working time must be part and parcel of a wider context including production and work organisation. Modifications of working time seem to be one of a number of factors in an overall process to restructure production methods and work organisation. The transition from Taylorist methods of work organisation and production management to post-Fordist methods paves the way for the introduction of innovative and diversified systems for managing working time. It should be noted, however, that an adaptation or modulation of working hours is not enough on its own to reduce working time. While some modifications of work organisation may give rise to compromises leading, in some cases, to an actual reduction of working time, the field surveys also show that adapted working hours do not necessarily lead to a reduction of working time. In other words, while changes in production organisation most often involve a re-organisation of hierarchical structures, internal mobility and increased multi-skilling, the removal of the links between equipment use times and working hours, task rationalisation and therefore an overall improvement in the competitive position of enterprises, the trade-off between income growth and free time may vary from one

enterprise or one sector to another. Even in the case of interest to us here, i.e. the choice in favour of a reduction of working time, it remains to be shown that this reduction has positive effects on employment.

Factors of an institutional and political type may also limit the efficiency of collective policies to reduce working time. The efficiency of such policies is closely linked to the nature of industrial relations and relationships between the various actors (government, employers and trade unions). It may well be that countries with centralised and coordinated bargaining systems and high levels of trade union representation within enterprises have more of a chance of reaching negotiated agreements to reduce working time likely to promote employment. A high level of coordination and articulation of the various bargaining levels would seem, however, to be necessary, but not enough on its own, to ensure the success of a policy to reduce working time. Consequently, in addition to the evident problems of coordination between the various levels of social concertation (both national and European), the emergence of compromises promoting employment is strongly conditioned by operators' practices and the objectives that they support: it is far from evident therefore that a collective reduction of working time will generate a convergence of interests that leads to increased employment. The balances to which negotiations of reductions of working time lead may also prove to be less than optimal as regards employment. While it is generally accepted that a reduction of working time improves the well-being of employees (*insiders*), it has yet to be proven that the methods by which this reduction of working time is implemented, in particular the level of wage compensation, are favourable to the unemployed (*outsiders*). Most supporters of job sharing often neglect these conflicts of interest and implicitly assume a solidarity between "insiders" and "outsiders", an assumption which seems to be very restrictive when viewed against the growth and permanent nature of mass unemployment. Uncertainties about the behaviour of the social actors in relation to wage compensation levels give rise to uncertain results in terms of employment. It is therefore crucial to take account of the conflicting objectives of the social actors and to look carefully at the circumstances that may pave the way towards compromises that promote employment. Theoretical developments regarding negotiation models shed an interesting light on the uncertain impact of a reduction of working time on employment. These models show, in particular, that inadequate representation of the interests of the unemployed (*outsiders*) in collective bargaining and the structure of the preferences of people with jobs (*insiders*) as regards the trade-off between income and free time both run counter to job sharing.

Faced with the conflicting results, in terms of employment and unemployment, of general and authoritarian policies to reduce working hours, some Member States have introduced tax incentive schemes to encourage enterprises to reduce working hours and to increase personnel

numbers. According to the promoters of these measures, the advantage of these schemes is that they not only trigger processes to reduce working time but also reduce enterprises' production costs and therefore step up the impact that changes in working hours have on employment. Schemes of this type take two different forms. Under the first type of scheme, subsidies are available for enterprises taking steps to reduce working time. Generally, the award of subsidies is subject to criteria of recruitment or even the maintenance of employment. Under the second type of scheme, hourly social security rates are modulated as a function of working time (Rocard proposal); this scheme has yet to be applied in practice.

Attempts to evaluate the efficiency of the first type of scheme show that only a small number of enterprises have responded to this incentive. This type of measure, like policies to reduce wage costs, is accompanied in most cases by fairly major side effects (windfall, substitution, displacement effects, etc.) that substantially reduce the efficiency of such financial incentives. While the impact of reductions of employers' social security charges on the propensity of enterprises to set in motion collective processes to reduce working time does not seem clear-cut, it would seem that these schemes have had more success from the point of view of developing certain individual forms of reduced working time and in particular part-time work.

In theory, tax incentive measures to reduce working time may, under certain conditions, prove effective in the fight against unemployment, in particular of the less skilled, provided that they generate an increasing relationship between working time and the average hourly rate of social security contributions. This type of public measure to promote job sharing policies (Rocard proposal) should nevertheless be interpreted with caution if it is not accompanied by an evaluation of its impact on public finances. In the favourable case in which these schemes on the one hand encourage enterprises to reduce working time and, on the other hand, lead to negotiated compromises that promote employment and reduce unemployment, the additional tax revenue (tax supplements) provided by additional recruitment may prove to be less than the public expenditure channelled into the reduction of social security contributions. It may well be that such systems are reflected by changes in the structure of compulsory levies and increases in other categories of taxation (or alternatively, a reduction of public expenditure with no change to the tax burden). It therefore appears paramount, in order to evaluate the net effects on employment of a modulation of social security contributions, to analyse the impact of these changes on the way in which wages are formed, the labour supply, household consumption and the impact of any substitution effects linked to increases in the tax burden on growth, employment and unemployment.

Contrary to first impressions, the studies analysed would seem to show that the conditions under which a reduction of working time can have a long-term impact on employment and unemployment are very restrictive. A general and uniform reduction of working time has more

to do with a Taylorist conception of work organisation and production methods and no longer seems to be in keeping with enterprises' new production constraints and employees' preferences. While most opinion surveys show that people are generally in favour of a reduction of working time, they also show a considerable diversity in people's preferences as regards reduced or adapted working time. Moreover, while most people are in favour of such a reduction, they are generally unwilling to give up some form of wage compensation. This does little to provide a favourable context to the job sharing effect of a general reduction of working time. The wide range of individual preferences as regards the reduction or adaptation of working time itself points in the direction of more flexible adaptations of working time. While general and uniform reductions of working time were undoubtedly necessary in the past, diversified methods of adapting or reducing working time during working life are nowadays more in keeping with employees' aspirations and enterprises' needs as regards competitiveness.

1. Introduction

The theme of working time has been at the core of the social debate since the industrial revolution. The focus of the debate has, however, changed over time. After the First World War, a certain number of legislative measures were introduced in order to regulate working time. The main aims of these initial laws on working time, which introduced an eight-hour working day, were to combat the adverse effects of long working days on employees' mental and physical health, to combat the high numbers of industrial accidents and to regulate and standardise employers' practices as regards working time. During the thirty years after 1945 and as working conditions began to improve and income started to grow, there was a change in the focus of the debate on working time. There was a shift away from "health" concerns towards the issues surrounding productivity gains, the key one being people's choices as to how to distribute the fruits of growth between leisure and consumption.

The rising imbalances and slackening off of growth brought about by the first oil crisis led to a lively and polemical debate about ways of reducing unemployment by a general reduction of working time in a certain number of European countries. In some Member States, trade union organisations took a favourable attitude towards a reduction or adaptation of working time, hoping for net job creation or at least for a curb on rising unemployment (safeguarding jobs). The economic impact of these aspirations, in some cases supported by a set of legislative or contractual measures, seems to have differed.

Although the debate about job sharing is an old one¹, one of the new elements in the resurgence of interest at the beginning of the 1980s, was the key place occupied by methods of implementing reductions or adaptations of working time. Micro-economic analyses (Anxo 1987, Catinat, Cette and Taddei 1986) had shown that a restructuring of the production process reflected by an increase in capital use times made it possible to reconcile both enterprises' needs as regards competitiveness (stability of production costs) and employees' aspirations for shorter working hours with no substantial loss of income. The spin-off effects of a reduction of working time on employment consequently depended greatly on methods of implementation and the extent of the re-organisations carried out. A set of macro-economic simulations was modelled in a large number of European countries and at the level of the European Community as a whole (Catinat, Donni and Taddei (1990)). Even though the results, in terms of net job creation, varied depending on the type of macro-economic model used (Keynesian or neo-classical), these simulations made it possible to find out whether their

¹ See in particular the debate during the 1930s (Anxo 1987, Cuvilier 1981, Sauvy 1967).

results were in keeping with hypotheses on levels of wage compensation, spin-off productivity gains and variations in equipment use times. While caution needs to be taken with this type of exercise, especially in view of hypotheses on the external nature of the labour supply and of working hours and equipment use times, these simulations made it possible to confirm the key role played by the re-organisation of production methods and of work organisation in a successful policy on working time.

From the end of the 1980s, and in view of the disappointing results, in terms of employment and unemployment, of some national experiments with a general reduction of working time, the debate took a new turn. There was a shift towards the problems raised by flexible methods of work organisation and the quest for a competitive edge. In some highly capital intensive segments of industry, the pressures being exerted by the internationalisation of trade and increasingly high levels of competition mean that enterprises' production practices (*just in time, lean production*) are tending to converge. The globalisation of competition, the introduction of new technologies and the gradual abandonment of Taylorist methods of work organisation have made it necessary to establish new labour force and production management methods. In a growing number of European enterprises, there has been a shift away from the traditional system of mass production based on strict task division towards more flexible forms of work organisation requiring greater commitment and autonomy on the part of workers, higher-level skills and a wider range of skills and a re-organisation of hierarchical structures (see Green Paper 1997). In many sectors (especially automobile engineering, see Bosch 1995, Lehndorff 1995), this quest for increased competitiveness has been reflected by enterprises' attempts to improve their production performance by extending equipment use times and introducing new and innovative methods of organising working time (annualisation, time banks, etc.).

At European level, improving labour flexibility is a key issue in efforts to improve the employment content of economic growth. Following the conclusions of the Extraordinary European Council on Employment in Luxembourg in November 1997, the Council adopted a Resolution (15 December 1997) on the 1998 Employment Guidelines intended to improve enterprises' and workers' capacities for adaptation. In order to promote more modern work organisation, the social partners were asked to negotiate, at the appropriate level (industry and/or enterprise), agreements to introduce flexible and innovative methods of work organisation reconciling enterprises' requirements as regards competitiveness and individual preferences as regards the division of time between work, leisure and education. This quest for

new forms of negotiated flexibility could, for instance, take the form of agreements on reductions of working time, the annualisation of working hours, the reduction of overtime, the development of part-time work, “lifelong” training and career breaks.

2. Objectives and presentation of the study

The main objective of this report is to try to pinpoint the main lessons to be learnt from experiments with reduced or adapted working time through an analysis of a set of studies on working time carried out by or on behalf of the Commission and the European Foundation in Dublin over the last two years². We shall look in particular at the impact of reduced/adapted working time on employment and unemployment on the basis of a critical review of these documents.

It was evident from our initial reading of the documents that the themes tackled and the methods used were very different. The particularly wide field of investigation ranges from macro-economic studies (simulation) to micro-economic studies (monographs). Some studies take a theoretical approach, while others are empirical or forward-looking. The studies also represent a whole range of disciplines (sociology, industrial relations, political economics, econometrics, etc.). This lack of comparability reflects the plural and multidimensional nature of the problems raised by working time.

An initial inventory of these studies made it possible to classify documents around a certain number of topics. Some studies ([3],[8]) use macro-economic simulations to try to quantify the effects of a general reduction of working time. These simulations relate either to all Member States [8] or to a small number of Member States (Germany, Belgium and France) [3]. Other studies, taking a more conceptual approach, use national experiments [12] or take a more global approach ([2], [10]) in an attempt to summarise what conditions are needed for a reduction or adaptation of working time to have a positive effect on competitiveness, employment and unemployment.

Recent European Councils have stressed that a tax environment more favourable to employment needs to be established. The current structure of the taxation system in the Member States, in particular labour taxation and the extent of the taxation wedge³, seems to have had adverse effects on the growth of employment, especially for less-skilled workers. This has given rise in recent years to thinking about the role of compulsory levies in trends in and adjustments of employment and working time over the short-term economic cycle. Some

² A complete list of the studies is given in the annex to this report. The figures between brackets refer to each document. In view of their wide-ranging nature [1] or the stage that they have reached [4], reports [1] and [4] will not be critically analysed.

³ The taxation wedge represents the difference between the cost of labour for employers and the net wage received by the employee.

recent proposals have advocated a differentiated reduction of indirect labour costs through the establishment of a graduated system of employers' contributions depending on working time (see the Rocard proposal). Some Member States, such as France (see the *Five-Year Law* and the *Robien Law*) and Belgium (*Global Plan*), have introduced incentive schemes combining a reduction of employers' charges with a reduction/adaptation of working time. Two studies ([7], [9]) summarise and evaluate the impact of compulsory levies and social security contributions both on employment and the distribution of working time. These works attempt, moreover, to assess policies intended to combine a reduction of employers' charges, a reduction of working time and a redistribution of employment.

As stressed above, changes over the last twenty to thirty years in the organisation of labour and production methods have been reflected by a series of changes affecting the organisation and distribution of working time. All the documents listed look at the topic of flexible working hours over a week, a year or even a working life. Even though this topic recurs so frequently, one study focuses specifically on the possibilities of improving employment and competitiveness by improving work organisation and on recent developments in the area of contractual and working time flexibility in Europe, on the basis of a survey conducted among a sample of European enterprises [5].

Other studies attempt to summarise enterprises' reactions to reduced working time from enterprise monographs covering five Member States of the European Union [6]. Other works analyse the relationship between trends in working time and economic growth within the Union [11] and the links between the distribution of working time and the distribution of income [13]. The final study [14] adopts a forward-looking point of view and analyses the advantages of an improved link between working time and vocational training.

This brief inventory highlights the wide range of topics tackled and consequently the problems raised by any attempt to summarise them. The wealth and lack of comparability of this material has made it necessary for us to select documents for analysis and to focus our attention chiefly on the employment dimension of the problems raised by working time. This summary report is structured as follows. Part I critically analyses macro-economic simulations carried out for the Commission in order to find out what consequences a general reduction of working time has on employment. Three main topics are tackled in Part II. An attempt is firstly made to summarise the body of thought on methods of implementing reduced or adapted working time and the conditions that are needed for such a reduction or adaptation to have a positive and sustainable effect on employment. We then look at the main development trends in the area of work organisation and flexibility (contracts and working time) and the relationships between adapted/flexible working time and the distribution of employment. We finally review

theoretical developments in the area of the relationships between fixed labour costs (structure of compulsory levies, indirect labour costs), working time and employment.

3. Reduced working time and employment: the macro-economic approach

3.1 Introduction

Analysis of the effects of a general reduction of working hours on macro-economic equilibrium, employment and unemployment has given rise to a great deal of literature over the last twenty to thirty years. Although this may seem somewhat simplistic, some major lessons can be drawn from this work:

- The results achieved, in terms of growth, employment and unemployment, depend to a large extent on the types of models used (neo-classical, Keynesian or neo-Keynesian) and the hypotheses adopted on methods of reducing working time, levels of wage compensation, spin-off productivity gains and the impact of reduced working time on production capacity and equipment use times.
- In general, macro-economic simulations show that a general reduction of working time has, other things remaining equal, an adverse effect on economic growth. Assuming that unit production costs increase either because of full or partial compensation or because of an increase in unit capital costs (linked to a possible decrease in equipment use times), there are further adverse effects on growth. The downturn in growth is due to the combined effect of a decrease in production capacity (supply) and a deterioration of the terms of trade (increased imports and reduced exports). However, if the reduction of working time leads to substantial productivity gains, for instance by closing up gaps in the working day and intensifying work rates (rationalisation, fatigue effect and motivation, reduction of absenteeism), adverse effects on growth will then be lessened. In general, models taking a neo-Keynesian approach tend in most cases to overestimate the multiplier effects, via a variation in aggregate demand, whereas models taking a neo-classical approach place more of a stress on the spin-off effects of a reduction of working time on aggregate supply.
- From the point of view of the impact on employment and unemployment, hypotheses on production cost trends are also crucial. An increase in unit labour costs in most cases brings about substitution effects between labour and capital and adverse effects on production volume, which have an adverse effect on the demand for labour. A general reduction of working time has positive effects on employment and unemployment which are balanced when reduced working time is accompanied by a reduction of production

costs. This reduction of production costs may come either from spin-off gains in labour productivity or from re-organisations of production methods.

3.2 Macro-economic simulations

3.2.1 Federal Planning Bureau: The macro-economic consequences of policies to reduce working time

The first type of econometric simulation, conducted by the Federal Planning Bureau [3], uses the national HERMES simulation models, of a neo-Keynesian type, to estimate the macro-economic effects of two forms of reduced working time; a general reduction of working time and a more decentralised reduction combined with a re-organisation of production processes (increased equipment use times and/or an extension of opening hours). The evaluation looks at three Member States (West Germany, Belgium and France). Three scenarios are put forward for each group: the first puts forward the hypothesis of an *ex ante* absence of wage compensation (same hourly wage), the second scenario supposes full compensation (maintenance of the per capita wage) and the third scenario adds a reduction of employers' social security contributions to this wage compensation.

The hypotheses adopted for these two methods of reduced working time are summarised in Table 3.1 below: the extent to which the volume of hours worked is actually reduced (column 2), the hourly productivity gains obtained from this reduction of working time (column 3), the level of wage compensation (column 4), the impact of this reduced working time on equipment use times (elasticity of re-organisation, column 5) and lastly a variation in employers' social security contributions (column 6).

Table 3.1: Hypotheses adopted

Method by which working time is reduced	Annual rate of reduction of working time	Rate of increase in hourly productivity	Level of <i>ex ante</i> wage compensation	Elasticity of re-organisation	Employers' social security contributions
<i>General reduction of working time (RWT)</i>					
➤ Scenario 1	➤ 0.01	➤ 0.1	➤ zero	➤ -0.3	➤ unchanged
➤ Scenario 2	➤ 0.01	➤ 0.3	➤ full	➤ -0.3	➤ unchanged
➤ Scenario 3	➤ 0.01	➤ 0.3	➤ full	➤ -0.3	➤ reduced
<i>Reduction/re-organisation of working time (2RWT)</i>					
➤ Scenario 4	➤ 0.008	➤ 0.3	➤ zero	➤ 1.7	➤ unchanged
➤ Scenario 5	➤ 0.008	➤ 0.3	➤ full	➤ 1.7	➤ unchanged
➤ Scenario 6	➤ 0.008	➤ 0.3	➤ full	➤ 1.7	➤ reduced

Source : Federal Planning Bureau.

In the case of a general and uniform reduction of working time (RWT), the annual rate of reduction of working time over the period 1996-2000 for all employees in the commercial sector is assumed to be 1%, i.e. the actual volume of hours worked has been reduced by 5% between the starting year (1996) and 2000. In the case of a reduction/re-organisation of working time (2RWT), the annual level of reduction is 0.8%, i.e. the volume of hours worked has been reduced by 4% by 2000. It is assumed, for both of these reduced working time methods, that working hours remain unchanged from 2000.

As regards spin-off productivity gains, the authors put forward the hypothesis of an increase in labour productivity which, depending on the scenarios, varies between 10 and 30%. According to the authors, the hypothesis of lower productivity gains in the case of RWT without wage compensation (scenario 1) is justified by the demotivating effect brought about by the lack of compensation (efficient wage).

As regards the impact of reduced working time on production capacity and equipment use times, the hypothesis put forward is one of a decrease in the production capacity of enterprises in the case of a general reduction of working time (RWT) and an extension of equipment use times in the case of a reduction/re-organisation of working time (2RWT). In the latter case (2RWT) it is assumed that 1/20 of enterprises (i.e. one quarter of enterprises after five years)

will re-organise production processes with a weekly reduction of working time of six hours and an increase in equipment use times of 10 hours⁴.

Lastly, concerning the reduction of employers' social security contributions, it is assumed that the budget surpluses generated by full wage compensation are recycled in order to obtain an *ex ante* budget neutrality.

3.2.1.1 Discussion of results

As is common with this type of simulation, the macro-economic impact of a reduction of working time is calculated on the basis of a variance with respect to a reference scenario without reduced working time.

Irrespective of the scenario adopted, the impact of a general and uniform reduction of working time (RWT) on economic growth is negative in comparison with the reference scenario in all three of the countries studied. All things remaining equal, the downturn in GDP is the greater, the higher the level of wage compensation. This downturn in growth can be attributed to the reduction of production capacity due to the lack of any re-organisation of production processes, making enterprises less competitive (loss of market share). This drop in competitiveness is largely due to the increase in unit production costs. This increase is due to the combined effect of the increase in unit capital costs brought about by reduced equipment use times and the potential increase in wage costs (*ex ante* wage compensation)⁵.

⁴ According to the authors of the report, this corresponds to the introduction of system of three shifts, each working 4 eight-hour days per week (32 hours per week) over a six-day week, i.e. a weekly equipment use time of 48 hours. The flexibility of re-organisation makes it possible to measure the effect of a 1% variation in working time on equipment use times. The authors put forward the hypothesis of a flexibility of 1.7, i.e.: flexibility of re-organisation = $(dDUC/DUC)/-(DH/H) = ((48-38)/38)/ -((32-38)/38) = 1.7$, where DUC and DH are the capital use time and working time respectively.

⁵ It should also be noted that, even without *ex ante* wage compensation, the macro-economic loop effects (Phillips effect, linked to the reduction of unemployment) push wages up causing tensions on the labour market and consequently a downturn in economic activity.

In the case of the variants without wage compensation, the drop in consumption brought about by the reduction of the available income of households exacerbates the depressive effect on economic growth. While the downturn in household consumption in the case of full *ex ante* compensation is not as great as in the scenario without wage compensation, this reduction does not offset the adverse effects on economic growth brought about by the reduction of production capacity, the downturn in investment and the decrease in the volume of exports.

Adverse effects on economic growth are, however, attenuated when wage compensation is accompanied by a reduction of employers' social security contributions, since the increase in production costs brought about by the wage compensation are partly offset by the reduction of employers' charges.

In the case of a reduction/re-organisation of working time (2RWT), changes to production processes, reflected by an increase in equipment use times, have a positive effect, all things being equal, on economic growth. The simulations also show that the results in terms of improvements in growth are the more positive, the lower the level of *ex ante* wage compensation. In contrast to a general and uniform reduction of working time without wage compensation, a re-organisation/reduction of working time (2RWT) without wage compensation or even with full wage compensation together with a reduction of employers' charges allows economic growth to be stepped up in a sustainable way in comparison with the reference scenario. These good results can be attributed to the fact that enterprises are more competitive because unit production costs are reduced. The improvement of the terms of trade, in particular the increase in exports, makes it possible to offset the decline in private consumption resulting from the drop in households' available income when the 2RWT is not accompanied by wage compensation. When the 2RWT with wage compensation is combined with reduced social security charges, the positive effects on economic growth are due to the combined effect of the improvement in external trade (as a result of increased equipment use times and reduced charges) and the increase in household consumption (as a result of the full compensation).

Lastly, the effects on economic growth of 2RWT accompanied by full wage compensation, without accompanying measures, are much less favourable than in the two previous cases because of the increase in unit production costs.

As regards effects on employment and unemployment, the simulations seem to provide somewhat conflicting results (see Table 3.2 below). Irrespective of the scenarios adopted, employment increases and unemployment decreases in comparison with the reference scenario. Overall, the effect on employment and unemployment is the more positive, the less the reduction in the working time leads to an increase in unit production costs. In the long term (2005) and in comparison with the reference scenario, net job creation is much greater when the reduction of working time is not accompanied by *ex ante* wage compensation (more than one million jobs created and a reduction of the level of unemployment by approximately one and a half percentage points). It should be noted, nevertheless, that these forms of reduced working time are in most cases reflected by a substantial downturn in economic growth especially when the reduction of working time is not accompanied by a re-organisation of production processes. While the “job sharing” effect predominates in these hypotheses, this runs counter to private household consumption (income effect).

Table 3.2: Results of the employment and unemployment scenarios (Variance from the reference scenario in 2005).

Method by which working time is reduced	Employment	Unemployment (in percentage point variances from the reference scenario, by country)
<i>General reduction of working time (RWT)</i>		
➤ Scenario 1	➤ 1 060 000	➤ [-1.9 - -1.6]
➤ Scenario 2	➤ 210 000	➤ [-0.6 - -0.01]
➤ Scenario 3	➤ 660 000	➤ [-1.3 - -0.4]
<i>Reduction/re-organisation of working time (2RWT)</i>		
➤ Scenario 4	➤ 1 022 000	➤ [-1.7 - -1.5]
➤ Scenario 5	➤ 486 000	➤ [-1.0 - -0.6]
➤ Scenario 6	➤ 995 000	➤ [-1.7 - -1.1]

Source : Federal Planning Bureau

Bearing in mind the hypotheses adopted and the exploratory nature of these simulations, the researchers conclude that policies involving a general reduction of working time have a sustainable effect on employment and unemployment only if there is no wage compensation or

possibly when this wage compensation is attenuated by accompanying public measures intended to reduce wage costs (reduction of employers' charges).

Without these accompanying measures, a policy involving a general and undifferentiated reduction of working time has a substantial negative effect on economic growth. In contrast, and bearing in mind the hypotheses adopted, policies to re-organise/reduce working time pave the way for *“an increase in the employment content of growth and an upturn in growth itself, especially if they are accompanied by a redistribution of the budget surpluses generated by the 2RWT taking the form of a reduction of social security contributions”*.

3.2.2 Aries, S. Holland [8] : The macro-economic consequences of a reduction/re-organisation of working time

This study, conducted by the Aries Institute and directed by S. Holland [8], analyses, like the previous study, the macro-economic consequences of a reduction of working time. The macro-economic simulations presented in this report were carried out by Alphametrics Royston. The lack of a detailed description of the structure of the model used made it impossible for us precisely to analyse the principal mechanisms conditioning effects on employment. Bearing in mind the impressive results obtained as regards employment, we shall assume here that the model is of a Keynesian type. In addition, the lack of a reference scenario common to all the scenarios makes it difficult to carry out any comparative analysis with the previous study or to compare the different scenarios with one another. The report focuses chiefly on the impact of a reduction/re-organisation of working time on employment and does not describe the spin-off effects of a reduction of working time on the other macro-economic variables (consumption, investment, external trade balance, unemployment)⁶. No less than 24 scenarios are analysed. The various evaluations cover all the Member States (with the exception of Sweden) and are based largely on a range of hypotheses external to the model concerning trends in economic growth and productivity.

The first set of scenarios [scenarios 1 to 12, which are “control scenarios” according to the author] contains no hypothesis on levels of wage compensation. The scenarios differ chiefly in

⁶ Apart, for certain scenarios, from the spin-off effects of reduced working time and possible wage compensations on the GDP growth rate. See Table 3.4 below.

terms of the extent of the reduction of working time (5 or 10%) and different hypotheses on trends in economic activity (GDP growth rate and productivity growth rate). The second set of scenarios [scenarios 13 to 18] makes it possible, according to the author, to isolate the impact of a variation in wage costs (without wage compensation, partial and full wage compensation) on a given level of economic growth. The only spin-off effect on growth is due to an increase in aggregate demand brought about by the wage compensation. The final set of scenarios [scenarios 19 to 24 which are the most realistic according to the author] differ from the previous scenarios in that use is made of different hypotheses on trends in growth and productivity.

In the case of the first set of scenarios [scenarios 1 to 12], as GDP and productivity growth rates are assumed to be external, the implicit assumption is that a general reduction of working time does not affect either GDP or productivity growth rates. It is therefore possible to put forward the hypothesis that the results given reflect a simple job sharing effect. Differences between the different scenarios in terms of jobs created can be attributed to the different hypotheses on trends in activity and variations of annual productivity levels. The lack of a hypothesis on the level of wage compensation seems to confirm that the positive effects on employment are largely due to the application of a simple rule of three. The volume of hours of work released by the reduction of working time is “converted” into employment in order to maintain a given level of economic growth. Any possible substitution effects between labour and capital and any possible impact on production capacity and their possible feedback effects on economic growth are therefore disregarded in this first set of scenarios.

In the second set of scenarios, the author puts forward the hypothesis of a GDP and productivity growth rate that is external and stationary⁷. In comparison with the previous set of

⁷ S. Holland’s report is somewhat imprecise here. Page 27 of the report states that scenarios 13-18 “look at a pay feedback against fixed output and productivity growth”, page 28 refers to “output and productivity trend as for decade since 1985” and lastly Annex 1 states that scenarios 13-18 “look at pay feedback against static output and productivity”.

scenarios, the difference here is provided by the level of wage compensation⁸ and its spin-off effect (*feed-back*) on aggregate demand and the level of economic activity and therefore the volume of employment. A reduction of working time accompanied by wage compensation has, in the simulations reported in this case, the effect of increasing household income and making economic growth more dynamic (multiplier effect).

The final set of scenarios [scenarios 19-24] differs from the previous set in that it contains a hypothesis on growth trends (based on DG II forecasts and common to all scenarios 20-24) and differentiated trends in annual productivity levels. This final set of scenarios which, it should be borne in mind, is presented by the author as the most realistic, has the advantage, like the previous study (Federal Planning Bureau), that it contains a reference scenario in which working hours are not reduced (scenario 20). Moreover, with the exception of scenario 19, the author puts forward the hypothesis of partial wage compensation (*sustained pay*).

3.2.2.1 Discussion of results

The results reported in S. Holland's study show that impact on employment varies substantially both between the different sets of scenarios and between scenarios belonging to a same set of scenarios. In general, impact on employment is very sensitive to the hypotheses on annual productivity growth. The results obtained show that the impact of a general reduction of working time on employment is a decreasing function of productivity. In other words, the more productivity grows, the less effect there is on employment. The simulations also show

⁸ The author of this report had some problems in understanding S. Holland's hypotheses as regards levels of wage compensation. Macro-economic simulations generally take account of three outline cases: by lack of wage compensation, modellers mean a reduction of the per capita wage (monthly or annual) proportional to the reduction in working time, in other words an unchanged hourly wage, by partial compensation they mean a partial increase in the hourly wage and lastly in the case of full wage compensation they mean that the hourly wage increases in proportion to the reduction in working time, so that the per capita wage remains unchanged. Three hypotheses on the level of wage compensation are adopted in S. Holland's study: a general reduction of working time without wage compensation, with wages reduced in proportion to working time, a maintained wage (or, to use the author's terminology, "sustained pay"), and lastly full compensation, i.e. an increase in the hourly wage proportional to the reduction in working time. Bearing in mind the lack of precision of the term "sustained pay" (hourly or per capita?) and in view of the results reported, we shall consider the category "sustained pay" to be similar to partial wage compensation.

that the employment effect is an increasing function of the GDP growth rate. Lastly, and in contrast to the previous study, the higher the wage compensation, the greater the impact on employment. This is due to the combined action of the multiplier effects linked to the increase in household income (*income effect*) and the reduction of working time (*sharing effect*). Consequently, the impact on employment is maximum when economic growth is not affected by the reduction of working time but is positively affected by wage compensation (see, for instance, scenarios 15 and 18 in S. Holland [8]). In these latter cases, a 5% or 10% reduction of working time would increase employment in the European Community as a whole by 14 or 30 million respectively over five years!

As noted above, only the last set of scenarios [scenario 21-24], makes it possible to compare the impact on employment of a reduction of working time with respect to a reference scenario [scenario 20] in which working time is not reduced.

For all the scenarios, the author, in his analysis of the results, argues in favour of spin-off productivity gains of the order of 50%, the reduction in working time being divided equally between increased productivity and increased employment. In other words, and on the basis of the works of Bosch and Lendorff, S. Holland would tend to consider that the gross effects on employment given in Table 3.4 should be readjusted downwards by some 40%. In Table 3.3 below, we have taken the impact of productivity gains into account in order to estimate the net effect on employment in comparison with the reference scenario. By way of comparison, the net impact on employment using the hypotheses on productivity gains set out in the previous study by the Federal Planning Bureau, i.e. 30 %, is shown in brackets.

Table 3.3: Net variation in employment in comparison with the reference scenario

Sets of scenarios	Reduction in working time (%)	Net variation in employment in comparison with the reference scenario (%)
<i>Third set</i> [Scenarios 19-24]		
➤ Scenario 21	➤ 5 %	➤ + 130% (+ 169%)
➤ Scenario 23	➤ 10 %	➤ + 303 % (+ 370 %)

Comparison of these two studies clearly shows the disproportionate nature of the results in terms of job creation. In the case of the Federal Planning Bureau, the spin-off effects on employment of a reduction of working time of 5% with wage compensation vary, depending on the methods of implementation, between 0.4% and 0.9% in comparison with the reference scenario. As Table 3.3 shows, the effect of a reduction of working time of the same order of magnitude (Scenario 21, 5%) would increase employment by 130% to 169% in comparison with the reference scenario on the basis of the hypotheses on spin-off productivity gains! Results as regards the impact of a reduction of working time on economic growth are also diametrically opposed. Whereas the evaluations of the Federal Planning Bureau showed a substantial negative effect (some -1% in comparison with reference scenario), in S. Holland's study, wage compensation has appreciable effects on economic growth (around +1%).

3.3 Comments

The main objective of this section is to examine whether the hypotheses adopted are credible and whether the results of the two sets of macro-economic evaluations described above are valid.

Conventional macro-economic models do not in general take very good account of operators' behaviour and strategy. These models have not, moreover, been specifically formulated to evaluate the macro-economic impact of policies to reduce and adapt working time. In particular, the rudimentary nature or even absence of external relationships reflecting, for instance, the implications for the labour supply, national methods of wage formation, company recruitment strategies and work organisation, etc., should encourage readers to view these studies with some caution and to consider the evaluations as no more than exploratory. As stressed above, an analysis of the macro-economic consequences of a reduction of working time makes it necessary to formulate hypotheses external to the model concerning key variables, such as levels of wage compensation, spin-off productivity gains and equipment use times. As the analysis of the two studies commissioned by the Commission shows, there are substantial variations in the results obtained, in particular in terms of employment and economic growth, depending on the hypotheses "external to the model" used by the modellers.

An understanding of the relationships between working time and these external variables is therefore crucial in any assessment of the validity of the results.

Relationship between stated and actual working time

The macro-economic evaluations surveyed by this report are based on the assumption that a reduction of working time is reflected by a proportional reduction of the volume of hours actually worked. The first key question is to find out whether this hypothesis is valid. The relationship between methods of implementing policies to reduce working time and their impact on actual working time are crucial in evaluating the potential impact of policies to reduce working time on employment. In other words, we feel that it is crucial to examine whether a reduction of stated working time (statutory or under collective agreements) is reflected *de facto* by a proportional reduction of actual working time. The French example is revealing here and provides a good example. The Popular Front reduced the statutory working week to 40 hours in 1936. It was not, however, until the beginning of the 1980s that the statutory working week in France tallied with the actual working week (i.e. over 40 years!). This rather extreme case shows that there is a complex relationship between working time regulated by law or collective agreement and actual working time and that the public authorities can seldom take direct action on actual working time. There are nevertheless grounds for thinking that a reduction of working time at industry level, because of its negotiated nature, is likely to have more of an effect on the volume of hours actually worked. The implementation of industry-wide agreements at enterprise level may lead, however, to a reduction of actual working time that is less than set out in the collective agreement as a result, in particular, of the different levels of coverage of collective agreements. The actual reduction of working time may therefore be less than proportional to the statutory or collectively agreed reduction which, in the short and medium term at least, reduces the potential effects of a policy to reduce working time on employment and unemployment.

Irrespective of the methods by which a reduction of working time is implemented, the micro-economic behaviour of operators facing a statutory or collectively agreed reduction of working time is a key element in analysing the relationship between normal and actual working time. From the employers' point of view, the fact that fixed wage costs are involved in the management of the work force (turnover costs, administrative costs, training costs,

compulsory levies, etc.) may have an impact on unit production costs and the volume of employment in the case of a reduction of working time. These costs do not depend on working time but vary depending on personnel numbers. A reduction in working time increases the relative proportion of these costs with respect to variable wage costs. When working time has to be reduced, enterprises therefore have an incentive to reduce personnel numbers and to increase the working time of their employees. This may be reflected either by an increase in overtime or, more generally, by a change in the distribution of working time within the enterprise (increasing the hours worked by part-time personnel, for instance). It may well be, therefore, that the impact of a reduction of working hours on the distribution of working time is such that the volume of employment remains unchanged or decreases, following a reduction of working time, even when the volume of production remains the same (see Anxo (1987), Hart (1987), Calmfors and Hoel (1984)). Similarly, employees may also try to offset any loss of income by increasing their average working time. The extent of these spin-off effects on the labour supply varies, however, depending on the level of wage compensation, the distribution of working time and income and individual choices between leisure and consumption.

The absence of these adjustment mechanisms from the two sets of simulation studies may therefore mean that the potential effects of a reduction of working time on employment and unemployment have been over-evaluated.

Level of wage compensation

As noted above, the macro-economic simulations show that the level of wage compensation has a major impact on the effects of a reduction of working time. In the case of enterprises having to compete, the increase in unit labour costs brought about by wage compensation is likely, when production remains constant, to bring about substitutions of capital for labour, which does little to promote employment. Higher production costs mean that enterprises are less competitive (fewer outlets) and have a negative impact on overall production levels which exacerbates the adverse effects on the demand for labour (competitiveness effect). From a macro-economic point of view, losses of market shares are also reflected by a downturn in exports and therefore a reduction in overall demand and a downturn in economic growth. While it is true that wage compensation has a favourable impact on consumer demand, as household incomes are increased (*income effect*), it does not have a favourable impact on

enterprises' investment demand since it adversely affects their profitability. Wage compensation leads, therefore, to inflationary effects which reduce domestic demand (*actual spending effect*) and exports. The Federal Planning Bureau's evaluations take account of these effects and, as noted above, the hypotheses adopted on wage compensation shape the employment effect of the various methods of reducing working time to a considerable extent. In contrast, S. Holland's evaluations show a diametrically opposite impact, since the greater the wage compensation, the more substantial the impact on employment. These surprising and highly optimistic results are undoubtedly due to the fact that only job sharing and income effects are taken into account in the simulations, whereas production factor substitution effects and competitiveness effects are disregarded. Modelling of this type does little for the credibility of the results obtained. In an unbalanced economy, subject to competition, the question that has to be raised is not how many jobs enterprises, faced with a reduction of working time, are willing to create or safeguard in order to maintain a given level of production. For enterprises whose main concern is one of profitability, the balance between the volume of employment and production is not independent of trends in production costs.

Spin-off productivity gains

All things being equal, the productivity gains brought about by a reduction of working time reduce production costs and reduce the adverse effects of a reduction of the use times of production factors on the volume of production. These gains, as we have seen, may be due to the elimination of dead times during the working day and more intensive working rates (rationalisation, fatigue effect and motivation, reduction of absenteeism). While the existence of spin-off productivity gains has a favourable effect on enterprises' production costs, these potential gains also reduce the sharing effect of a reduction of working time for a given level of production, in the short term at least. It should also be borne in mind that, in the longer term, the increase in labour productivity has a favourable effect on the competitiveness of enterprises, households' available income, economic growth and therefore ultimately on employment.

The problem, empirical in nature, is to find out whether positive effects can be expected and whether these potential productivity gains are permanent or transitory (linked, for instance, to the productivity cycle).

A number of econometric studies (see for instance Anxo & Bigsten, 1989, Cueva & Heyer, 1997 and Hart & MacGregor, 1988) have been conducted in recent years in order to estimate the effects of a reduction of working time on labour productivity. These studies have provided, however, conflicting results. Some empirical studies confirm that there are substantial spin-off gains, whereas others point to negative effects. These latter results do not, however, mean that some enterprises are not in a position to step up labour productivity when working time is reduced. What these econometric estimations show is that, on the one hand, initial working time has to play a key role in the appearance of productivity gains and that, on the other hand, it is unlikely that these gains will be distributed uniformly throughout the economy. In the case of the two simulations studied in this report, the Federal Planning Bureau puts forward the hypothesis of an *ex ante* increase in productivity of between 10 and 30%, whereas S. Holland's study assumes *ex post* spin-off productivity gains of 40 to 50%. While the Federal Planning Bureau's hypotheses do not differ from other macro-economic simulations, the hypothesis of an *ex post* increase in the latter study has a series of evident conceptual drawbacks. The parameters used by the Federal Planning Bureau make it possible internally to analyse the variation in productivity gains in respect of macro-economic variables, whereas, in the case of S. Holland, the impact on employment is corrected *ex post* by the application of a criterion external to the model and valid for all 14 countries studied, which detracts from the validity of the results obtained.

Variations in equipment use times

A reduction of working time does not just have an impact on the volume of hours worked but also on equipment use times. Recent theoretical works (Anxo et al (1995) and Catinat, Cette & Taddei (1994)) have highlighted the importance of variations in equipment use times in the efficient promotion of employment and economic growth by a reduction of working time.

For a given distribution of the volume of work between different shifts, a reduction of working time leads to a reduction of capital use times. The works cited above have shown that, in such a case, unit production costs could be kept stable only under very restrictive conditions. The main cause lies in the fact that a reduction of equipment use times increases the cost of use of capital per unit produced. In the case of enterprises that are highly capital intensive, the

objective of cost stability makes it necessary to reduce the hourly wage, even assuming a substantial increase in labour productivity. If, in contrast, there are zero productivity gains, this same objective makes it necessary to reduce the hourly wage irrespective of the capital intensity of the enterprise in question. Under these circumstances, it may well be, as stressed above, that a general reduction of working time increases unit costs even if this reduction is not accompanied by wage compensation. This observation suggests in turn that a reduction of working time may have adverse effects on the competitiveness of enterprises and therefore on the growth of production and employment, especially in sectors exposed to competition.

An increase in equipment use times makes it possible, in contrast, for enterprises to avoid the reduction of production capacity connected with a reduction of working time and even substantially to improve their profitability. The studies cited above have shown that a major restructuring of the production process, intended to increase equipment use times, would make it possible to reconcile both the enterprise's requirements for competitiveness and workers' aspirations to reduce their working time with no substantial loss of income. This would then make it possible for the enterprise to reduce working time with wage compensation even if labour productivity remains unchanged. The restructuring of the production process has, however, to be substantial enough to be able to offset the increase in unit costs brought about by the reduction of working time.

It should nevertheless be stressed that even though some enterprises may be able to offset increases in production costs by extending equipment use times, it may well be that this possibility does not exist at the level of the economy as a whole. An increase in equipment use times at a more aggregated level requires a degree of flexibility of work organisation and considerable adaptability of production methods. At a macro-economic level, the average use times of equipment may therefore at best remain unchanged and at worst decline.

Empirical studies analysing the relationships between employment, working time and equipment use times are rare. One study (Anxo and Taddei (1995)) attempts to fill this gap by describing trends in equipment use times in five European countries. This study shows that trends in equipment use times have been almost stationary in these countries over the last twenty years. This trend in equipment use times is interesting as it would seem to confirm the hypothesis that a reduction of working time is accompanied in the long term by a re-

organisation of production methods involving sustained or even increased equipment use times. A more detailed examination of the medium-term data does not seem, however, to bear out this hypothesis. The reduction in working time that took place during the 1970s has ended in a reduction of average weekly equipment use times despite the growth of shift work. In addition, the reversal of the trend, at the beginning of the 1980s, reflected by increased shift work and extended equipment use times, coincides, in these countries, with stable or extended working time. Looking solely at trends in industrial employment, the stationary nature of equipment use times over the long term has coincided with an increase in capital intensity, a relative increase in shift work and a decline in industrial employment. The hypotheses adopted, for the macro-economic simulations, of extended or sustained use times would therefore seem to be questionable from an empirical point of view and it may well be that the most pessimistic scenarios are actually borne out. However, while the Federal Planning Bureau's hypotheses on the medium-term (10 years) impact of a reduction of working time appear, all in all, to be fairly prudent (assuming a re-organisation of production methods by 25% of enterprises), these re-organisations nevertheless involve an increase of 10 hours in weekly equipment use times which, in the light of the historical trend in equipment use times, is fairly high. In the second study, the lack of hypotheses on the impact of a reduction of working time on equipment use times is very problematic and raises questions about the validity of the results obtained⁹.

Reduction of working time, comparability of the labour force and labour supply

As a result of their aggregate nature, macro-economic models assume that the labour force is comparable and completely mobile in both geographical and occupational terms. The two studies analysed here are both subject to this constraint of aggregation. The hypothesis of a complete fluidity of and a full match between the labour supply and demand detracts from the explanatory abilities of the models used, especially as regards the spin-off effects of a reduction of working time on unemployment. Many studies have shown that the individual and regional distribution of unemployment is far from uniform at both national and European Community level and that mass unemployment may go hand in hand with a shortage of skilled labour. It may well be, therefore, that a reduction of working time exacerbates imbalances on the labour

⁹ The simulations conducted by Alphametrics implicitly assume that equipment use times are maintained, which, at the level of 14 countries and over a five-year period, does not seem very likely because of the very substantial increase in shift work that such a hypothesis would require.

market. These labour force matching problems may in particular create bottlenecks leading in turn to inflationary tensions in certain labour market segments and ultimately reducing potential effects on employment. It is unlikely, moreover, that a reduction of working time, without accompanying measures, will in itself improve the employability of jobseekers or, for instance, that the long-term unemployed will be more likely to find jobs.

The macro-economic models discussed in this report put forward the hypothesis of an external labour force. This hypothesis is restrictive and it may well be that a reduction of working time may not only have an impact on resource allocation within enterprises, but may also modify the level and composition of the labour supply. People who much prefer a shorter working day (in particular women) may enter the labour market and the concomitant increase in participation rates may help to limit the impact of a reduction of working time on unemployment. Moreover, if the reduction of working time, assuming the favourable hypothesis of a substantial effect on unemployment, improves the labour market situation, this improvement may have an impact on the total labour supply (changes in activity rates) and consequently on overall activity rates. While the simulations produced by the Federal Planning Bureau seem to have taken partial account of these spin-off effects on the labour supply, the same cannot be said of the second study which, in most cases, identifies the spin-off increase in employment with an almost proportional reduction in unemployment!

The hypothesis that the reduction of working time is limited to the commercial sector, in the case the Federal Planning Bureau's evaluations, also raises a certain number of problems. It is unlikely that public sector employees will passively accept, for obvious reasons of social justice, a reduction of working time limited to the commercial sector. Extending a general reduction of working time to the economy as a whole obviously raises problems from the point of view of its financing especially in a context of budget cutbacks and tight controls over public deficits. Lastly, in the same study, the drop in unemployment recorded in the three Member States of the European Community due to the increased competitiveness of enterprises, may be reflected by a downturn in employment in the other Member States. If there is no change, it may well be that the unemployment level remains unchanged in all the Member States.

In conclusion, the simulations analysed highlight the strengths and weaknesses of the macro-economic approach. Among these strengths, the possibility of modelling separate sets of

scenarios makes it possible to assess whether results are in keeping with the hypotheses adopted. These macro-economic simulations highlight, in particular, the importance of the methods by which working time policies are implemented and their consequences on the efficiency of policies to reduce working time from the point of view of employment and economic growth. However, the lack of information on the micro-economic foundations of the adaptation mechanisms implemented and the external nature of some key variables such as the level of wage compensation, spin-off productivity gains and the impact of reductions of working time on equipment use times obviously represents a weakness. The micro-economic behaviour of economic operators (enterprises, workers, social partners) is necessarily, as a result of the level of aggregation of the models, extremely simplified and takes only very insufficient account of the adjustment mechanisms described above. These mechanisms, as we have seen, may substantially reduce the positive results expected from job sharing policies. In this context, critical analysis of the validity of the hypotheses adopted, especially in respect of the evaluations reported by S. Holland, leads us to consider that the results, in terms of employment and unemployment, are undoubtedly over-estimated.

4. Reductions of working time and employment: an approach based on micro-economics and monographs

The aim of the first part of this chapter is to summarise the studies about the ways in which reductions of working time can be implemented and the conditions that need to be satisfied if a reduction of working time is to have a positive and sustainable effect on competitiveness, employment and unemployment. The second part of the chapter looks at the efficiency of the various systems of reducing employers' charges in encouraging enterprises to reduce their working time and to work towards job sharing.

4.1 *Reductions of working time and job sharing: paving the way for job creation*

Our critical analysis is based on four studies commissioned by the European Commission and the European Foundation in Dublin. The first two studies ([2] & [10]), by G. Bosch and B. Marin, take a conceptual and normative approach and examine the best ways in which a successful policy on working time can be implemented. The third study, produced by D. Taddei for the European Foundation in Dublin, attempts to pinpoint, from enterprise monographs describing experiments with reductions of working time in five Member States of the European Community¹⁰, the way in which these reductions were implemented and their impact on employment, productivity and working conditions.

As we stressed in the introduction, the changes that have taken place over the last twenty to thirty years in labour and production method organisation have been reflected by a number of changes affecting the organisation and distribution of working time. The fourth study [5], conducted by the Cranfield Institute, examines, from a sample of European enterprises, developments in the area of contract and working time flexibility in Europe.

The extreme wealth and diversity of the materials surveyed is striking. The ambitious goals and the extent of the field covered by these studies combined with the sociological and economic dimensions of the topics tackled, made it necessary for us to make restrictive or even reductive choices which, we hope, do not betray the authors' thinking. Bearing in mind this diversity, we shall focus chiefly on collective methods of reducing working time and their impact on employment and will look only briefly at more individual forms of reduced working time (part-time work, parental leave, progressive retirement, etc.). Even a collective reduction of working

¹⁰ Germany, Belgium, France, the Netherlands and Sweden.

time may, however, take different forms (daily, weekly, annual reduction, etc.) and the methods by which reductions of working time are implemented may have a differing impact on enterprise performance and employment. The problems of working time cannot be reduced simply to the dimension of employment since other objectives may be involved: improving social well-being and the quality of life of households, facilitating transitions between different types of activity during life or promoting a more egalitarian gender division between production and domestic activities. In any case and irrespective of the objectives pursued, reductions of working time have an economic impact that cannot be disregarded.

As most of the authors stress, the reduction and redistribution of working time is not a universal panacea for unemployment and, if it is to be effective, must meet a certain number of conditions. A theme that recurs in the studies analysed is that the efficiency, in terms of employment, of reductions of working time seems to be highly dependent on the conditions under which these reductions are implemented and the institutional, social and economic environment in which economic operators are working. Overall, the authors are nevertheless convinced that reduced working time is, in parallel with more traditional measures to support employment, an efficient way of combating unemployment. The various authors also stress the need to find new types of social compromise promoting a new organisation of time likely to have a favourable impact on employment. If these new policies on working time are to be efficient, they cannot be implemented in a mechanical way, but must reconcile both the requirements of enterprises as regards competitiveness and people's individual preferences as regards their overall working hours and the times at which they actually work.

The methods by which reductions of working time can be implemented, and in particular the type of social dynamic able to generate a virtuous circle reconciling workers' preferences for more free time (and greater control over their working hours) with improvements in the competitiveness of enterprises represent a first area for examination. The ways in which working time can be reduced, the nature of industrial relations and bargaining methods seem, in this case, to play a key role in reconciling sometimes diverging interests. In other words, most authors attempt to pinpoint which types of new social compromise can reconcile the sometimes conflicting objectives of economic efficiency and social justice. The conditions under which reductions of working time can create or safeguard jobs represent a second area of examination. In particular, which forms of reduced working time and which methods of implementation are most likely to improve the competitiveness of enterprises, economic growth and to reinforce any potential job sharing effects.

4.1.1 Factors promoting job sharing

Over the last ten years, various theoretical developments, based in most cases on micro-economic optimisation models, have made it possible to pinpoint a number of factors that help reductions of working time to have an efficient impact on employment. Without wishing to be simplistic, a reduction of working time may have a positive impact on employment if it is accompanied by a re-organisation of production methods that makes enterprises more competitive. In general, these theoretical studies show that a reduction of working time has a particularly good effect on employment when it is accompanied by a reduction of unit production costs. This reduction of unit production costs may be the result of an improved use of equipment (increased equipment use times or extended opening hours), spin-off productivity gains linked to the reduction of working hours or an improved match between working time and short-term economic and seasonal fluctuations in activity. If, however, a reduction of working time goes together with a decrease in equipment use times and/or a wage compensation that is not compatible with sustained or reduced unit production costs, effects on employment will be negative. While the case studies examined by the various documents analysed here (see below) stress the important part that re-organisation processes play in ensuring that reductions of working time have a positive effect on employment, the field surveys also show that the conditions under which reductions of working time can have a positive effect on employment are restrictive, at least at a more aggregate level.

In addition to these factors, some authors (especially [2] & [10]) examine the impact that the far-reaching changes that have taken place over the last twenty to thirty years in the organisation of labour and production processes has had on the emergence of new forms of working time which may be reflected in some cases by a negotiated reduction of working time likely to promote employment.

In the first place, the abandonment of Taylorist methods of work organisation by some enterprises has been reflected by increased multiskilling and has extended the internal mobility of the labour force. In the opinion of some authors ([2] & [10]), these changes promote adaptations/reductions of working time. The introduction of new forms of calculating working hours on an annual basis or even during working life (thematic, parental, training leave, etc.) require the internal work force to be relatively multi-skilled and to possess a certain degree of internal mobility. Replacing absent employees means, for instance, that tasks and duties have to be re-allocated within the enterprise; this is facilitated by these changes in work organisation.

It also seems to be easier to adjust and reduce working hours in enterprises in which the delegation of responsibilities is encouraged (modification of hierarchical structures).

A shift from pay systems based on working hours to systems based on monthly pay may also make the introduction of new forms of working time more acceptable to employees. The guarantee of a fixed income irrespective of changes in tasks and therefore in working hours encourages the introduction of new forms of managing working time which may be reflected in some enterprises by a reduction of working time.

Moreover, as stressed by G. Bosch [2], some types of social and industrial relations within enterprises (quality of social dialogue, representativeness of personnel and active participation by employees) are more likely to lead to negotiated agreements promoting some forms of job sharing. The fact that these new methods of organising working time (annualisation for instance) are less transparent than more comparable traditional standards of working time, requires a greater degree of active participation and monitoring by workers' representatives and increased access to information. Some procedures by which the social partners are consulted and participate may also be better than others at shaping choices that promote employment. Negotiated agreements can in particular lead to a substantial reduction of employees' actual working time in return for a flexibility that is not welcomed in some cases because working hours are more variable and less predictable (shorter notice of changes).

In other words, a reduction of working time is more likely to entail compromises promoting employment within enterprises that have introduced measures promoting functional flexibility. It should be stressed, however, that while flexible working hours make it possible to stabilise employment during the short-term economic cycle, they also reduce external mobility. While the introduction, moreover, of more flexible forms of work organisation promotes adaptations of working time and in some cases increases employees' well-being, it has yet to be shown that enterprise bargaining leads to substantial reductions of working time and negotiated compromises that promote employment.

4.1.2 Trigger factors and impact on employment: what can be learnt from enterprise monographs

As stressed above, some studies (D. Taddei [6]) attempt to draw lessons from experiences of reducing or adapting working time within enterprise from enterprise monographs conducted in five Member States of the European Community. Taking an inventory of national studies conducted during the period 1988-1995 as a starting point, D. Taddei concentrates, in his analysis of the behaviour of enterprises faced with a reduction of working time, on two main themes: on the one hand, those factors that trigger reductions of working time and negotiation and implementation procedures for reductions of working time and, on the other hand, the

impact of reductions of working time on employment and the other economic indicators of enterprises.

New and innovative forms of work organisation that involve an adaptation or reduction of working time are often introduced as a result of changes in the economic and social environment of enterprises. As D. Taddei rightly stresses, a reduction of working time is not generally an objective of enterprises with the result that they do not introduce such reductions at their own initiative. Analysis of the case studies clearly shows that reductions of working time are more often the result of collective bargaining within enterprises. Examination of bargaining processes also shows that, in most of the cases observed, the bargaining process was set in motion by employers. The various forms of collective reductions of working time surveyed at enterprise level are therefore closely linked to procedures to adapt and modulate working hours. In other words, and in the words of D. Taddei [6], the problems surrounding working time during the last ten years have been characterised by “*a simultaneous emphasis on the need to link a reduction with an adaptation of working time*”. In most negotiations, reduced working time seems to be a counterpart for adapted working hours and is not an objective in itself.

The impact of a reduction of working time on enterprise behaviour is obviously linked to the circumstances that led enterprises to set in motion a modification of working time. The author pinpoints two types of circumstance that may act as triggers:

- a reduction of the collective reference standard that is imposed on the enterprise (constraint/external shock) because of changes to working time laid down by law or collective agreement;
- circumstances brought about by developments specific to the life of the enterprise.

In the case of reductions of the collective standard of working time, the author notes that during the period in question (1988-95) there was no reduction of statutory working hours in any of the five countries studied. The first type of trigger factor for a reduction of working time, where the obligation to reduce working time is imposed on enterprises through industry-wide collective agreements, concerned only Germany. According to the author [6], these agreements do not seem merely to have imposed additional constraints on German enterprises because they also set out possibilities for more flexible internal operation. Analysis of the implementation of these industry-wide agreements at enterprise level shows, however, that few enterprises took up these possibilities of adapting working time, since less than 15% of the enterprises in question made any change to working hours and less than 5% adapted working hours in order to improve capital use.

In the case of circumstances brought about by developments specific to the internal operation of enterprises, the field studies show that reductions of working time are more often set in motion by employers. In these circumstances, working time is usually reduced as a response to technological criteria or possibly changes in the economic environment of enterprises (changes in markets, the economic situation and competition). Changes in working hours in the first case are often connected with the introduction of new equipment and increases in capital intensity that require, for reasons of profitability, increases in equipment use times. These organisational changes often go together with a re-organisation of working time that in most cases changes employees' working hours for the worse. In such cases, reduced working time is then a counterpart for the inconveniences connected with changes in production processes.

As stressed by D. Taddei [6], the effects of reduced working time on the economic performance of enterprises and on employment come up against substantial methodological problems. In most cases it is very difficult to isolate the impact of reduced working time on employment from circumstances that can be attributed, for instance, to changes taking place in the economic environment such as changes in the economic situation, the introduction of new technologies, changes in production methods and work organisation, etc.

While the results of the evaluation studies conducted at enterprise level on the impact of reduced working time on employment are somewhat contradictory, the field surveys nevertheless tend to show that reduced working time has in some cases made it possible to improve the employment situation either in a defensive way by limiting redundancies or in an offensive way by helping to create new jobs. In general, the impact of reduced working time on employment seems to be especially positive if it is accompanied by changes to production structures that improve the use of production equipment.

The monographs also confirm that increases in employment are in most cases less than proportional to the reduction of working time. This recurring finding can be explained both by the concomitant increase in production costs entailing a reduction of production capacity and production volume, especially when the reduction is not accompanied by a re-organisation, and by the substantial productivity gains generated by processes to adapt or reduce working time. In general, and all things being equal, the job sharing effect is proportional to the reduction of working time if the growth in production volume is greater than the productivity gains generated by the reduction of working time and by any re-organisation. In other words, the employment impact of a reduction of working time is highly dependent on the economic and competitive situation of enterprises. In the case of enterprises working in booming markets and when reduced working time makes it possible, as a result of re-organisation, to improve the enterprise's competitive situation, reduced working time may increase production volume and

personnel numbers. At a macro-economic level, these conditions seem very restrictive, however, and the field surveys show that such a situation is rare.

4.1.3 Reduction of working time, overtime and adjustment of employment.

Variations of working hours, in particular by stepping up overtime or by laying personnel off, are the traditional methods by which the volume of employment is adjusted to variations in economic activity. These adjustment mechanisms mean that enterprises can retain skilled personnel during downturns of economic activity and can very quickly make the most of an upturn in the economy and limit transaction costs connected with personnel turnover. This type of short-term adjustment is, nevertheless, very expensive and a growing number of enterprises are introducing new forms of managing working time (annualisation, time banks, etc.) in order to curb the costs of overtime. Some enterprises may therefore see a reduction or adaptation of working time as an opportunity to reduce wage costs. In this respect, adapted working hours in some cases involve the replacement of financial compensation by time-off in lieu. The introduction, for instance, of systems where working time is regulated on an annual basis may play a substantial part in reducing unit production costs, improving productivity and production efficiency and adapting production levels in better ways to fluctuations in demand. Changes in working hours, depending on work in hand, are often disadvantageous for employees since the life of households outside work is disturbed. The field surveys show therefore that working time tends to be reduced in return for adapted working hours. Reconciling the sometimes diverging interests of employers and employees nevertheless requires specific methods of regulation between the social partners. While the institutional framework and economic and social regulation systems in some countries promote negotiated flexibility (Germany, the Netherlands, Sweden, for instance), the low level of trade union representation in enterprises in other Member States (France, for instance) represents a major institutional obstacle to the success of such negotiated compromises.

As noted in the previous chapter, some enterprises faced with a reduction of working time may, instead of recruiting new employees, make more use of overtime, thereby reducing the potential effects of reduced working time on employment. The rationale for such behaviour lies either in the fact that work force adjustments entail substantial costs (fixed costs, see below) or in the fact that there is a shortage of skilled labour. If a reduction of working time is not to be accompanied by an increase in overtime, a prerequisite is that the proportion for which fixed costs account and the costs of adjusting the labour force are relatively low. These costs naturally vary greatly depending on the type of activity and sector in question. In other words, and all things being equal, it is to be expected that the beneficial effects of job sharing on employment differ greatly depending on types of job and the sectors to which enterprises

belong and that the most substantial effects on employment tend to be in sectors where fixed labour costs are relatively low and where less-skilled workers are in the majority.

An increase in overtime during a reduction of working time may also be due to a mismatch between the labour supply and demand. A shortage of skilled labour and low occupational and geographical mobility may, during a reduction of working time, cause the total production volume to fall and may have a negative impact on growth and employment and therefore on the level of and trends in unemployment. In order to combat labour shortage problems, policies to adapt/reduce working time should, in the opinion of some authors ([2], [7] and [10]), also be supplemented by an extension of active employment policy measures promoting both the geographical and occupational mobility of the labour force.

In order to prevent or limit the negative effects of increased overtime on the job sharing effect of reduced working time, some authors suggest either a limitation of overtime by the authorities or the introduction of new pay systems based on time off in lieu rather than financial compensation ([2], [7] [8] and [10]). Acceptance of these changes in pay structures by employees or their representatives nevertheless depends to a large extent on the distribution of wages within the enterprises or sector in question. Limiting or abolishing paid overtime may therefore come up against a degree of resistance from employees or their representatives. If the distribution of wage incomes is very dispersed and there is a relatively high concentration of low wages, this may place a curb on the introduction of more flexible arrangements of working hours and reductions of working time. The British example provides a good illustration here (see, for instance, the remarkable study conducted by the Low Pay Research Trust [13]). For a large number of British workers overtime is a structural element of their pay. For many British households, overtime tends very often to be a way of offsetting inadequate wages. A reduction of overtime may lead to a substantial reduction of household incomes in the case of an income distribution characterised by a high proportion of low wages. As the Low Pay Research Trust [13] stresses, measures to promote less income dispersion and to raise low wages may prove to be more efficient in reducing or containing overtime than a reduction of working time or a statutory limitation of overtime.

4.1.4 Income distribution, wage compensation and the effects of a reduction of working time on employment

The question of wage compensation, as we have seen, plays a key part in the impact of reduced working time on trends in enterprises' costs and on the effects of a reduction of working time on employment. In general, wage compensation is a complex problem and has given rise to a polemical and lively debate. A key aspect here is the time scale. While reductions of working time may be accompanied by negotiated compromises involving full and immediate compensation, medium-term trends in wages may be lower than would have been the case without this reduction of working time. While the compensation is partial from a dynamic point of view, it appears to be full from a static point of view. Some authors (see [2], for instance) therefore consider that collective reductions of working time must be part and parcel of a long-term bargaining process (multi-annual collective agreements). Most collective reductions of working time (Germany, the Netherlands) over the last ten years have usually been associated with some pay restraint. Unlike a collective reduction by a statutory route, these multi-annual agreements have the advantage that the reduction of working time is negotiated together with the issue of wage compensation. By allocating a proportion of future productivity gains to the reduction of working time and to wage compensation, negotiated agreements make it possible to spread the cost of reductions of working time over several years.

The issue of wage compensation can also be fleshed out from an analysis of the enterprise monographs (see [6]). In the case of an offensive reduction, accompanied by a re-organisation of labour and production processes, wage compensation is in most cases full. The productivity gains brought about by the reduction of working time (fewer gaps in the working day and more intensive work rates) and the extension of equipment use times make full compensation possible and in some cases may even improve employees' purchasing power. In the case of a defensive reduction (safeguarding jobs), where sustaining staff numbers means that the wage bill has to be reduced or kept at the same level, there is in most cases zero or partial wage compensation.

In most Member States of the European Union, collective bargaining plays a key part in regulating the employer-employee relationship and working conditions. Pay, working time and the distribution of working hours are all fields covered by collective bargaining. The behaviour of the social actors needs to be analysed in order to find out what types of trade-off are possible between pay, working time and employment levels. The key issue is one of finding out what conditions need to be satisfied for the outcome of collective bargaining on pay and working time to have a favourable effect on employment and social well-being. In other words,

it is paramount to determine those circumstances in which collective bargaining on reductions of working time leads to a situation that promotes employment. In general, it may well be that compromises on levels of wage compensation depend on the distribution of income. The study conducted by the Low Pay Research Trust [13] provides interesting information on the relationships between income distribution, working hours and wage compensation. This study shows, on the one hand, that the distribution of working time is not independent of the distribution of income and that, on the other hand, the distribution of income may have an impact on the trade-off between working time and income growth which in turn does little for the job sharing effect of a reduction of working time. In other words, an income distribution which is very dispersed with a high concentration of low wages may place a curb on the introduction of negotiated agreements to reduce working hours that promote employment since, as noted above, wage compensation plays a key part in the employment effect of a reduction of working time. As the authors of the report stress, an authoritarian and collective reduction of working time without wage compensation in Great Britain would be likely to come up against opposition from a large proportion of British employees and their trade union representatives precisely because of the high concentration of low wages.

It is also interesting to note that most of the collective reductions of working time over the last ten years have taken place in Germany and the Netherlands where the average income level is relatively low and income distribution is not very dispersed. In other words, choices of reduced working time depend to a large extent on the distribution of income and rates of economic growth. The study conducted by Meulders and Plasman [11] convincingly demonstrates that the slowing down of reductions of working time in the latter part of this century coincides with the downturn in growth from the middle of the 1970s, a downturn which is undoubtedly not without an impact on the trade-off between free time and consumption in sharing out the fruits of growth. In a period of recession and slacker economic growth, it is doubtful whether the social partners will reach compromises on reduced working time accompanied by wage compensation that promote job sharing and therefore that one of the prerequisites for the efficiency of policies to reduce working time, i.e. pay restraint, will be met.

4.1.5 Flexible working time: the European experience

Over the last twenty to thirty years, the globalisation of competition has profoundly changed production methods and work organisation in enterprises. In most authors' opinion, a successful policy on working time must take into account the new needs of enterprises in terms of flexible production. Changes in consumer behaviour and the product diversification to which these changes have led have meant that an increasing number of enterprises have gradually abandoned Taylorist methods of mass production. The introduction of these new methods of

organising production has been reflected, as we have seen, by a gradual abandonment of the traditional ways of adjusting employment (overtime, variable stock management) and by a much more flexible organisation of work and working time. This new paradigm for work and production organisation seems to be making the conventional weekly working time standard obsolete for some enterprises and is forcing them to rethink the ways in which they regulate working time.

Changes in the structure and distribution of working hours are only a subset, albeit important, of recent changes affecting production methods and work organisation. These new trends have, as noted above, generated changes in pay formation methods (monthly pay is now widespread) and a convergence of the status of different groups of workers (white-collar and blue-collar). There has been a marked shift away from the traditional methods of managing working hours (standardisation and concentration around a weekly norm, the traditional way of monitoring working hours) towards more diverse and individual working hours. These changes in work organisation are also being reflected by a decentralisation and delegation of responsibilities and decision-making (increased autonomy, multiskilling, team work). In a growing number of enterprises, strict control of working hours is being replaced by performance monitoring. These changes often give employees much more freedom in choosing their working hours. These new trends therefore reflect the transition from a relatively comparable structure of working time organisation to more complex and more diversified structures. The field surveys show that these new and innovative forms of work organisation are not just limited to manufacturing industry but are also spreading to other sectors such as the health care sector, the retail trade, banks, etc. These new ways of organising work and working hours are coming up, however, against problems connected with infrastructure (accessibility and flexibility of institutional childminding methods, urban transport, etc.) and are also meeting a degree of resistance from employees.

The study conducted by the Cranfield Institute ([5]) analyses recent developments in contract and working time flexibility in Europe from a survey conducted among a sample of European enterprises.

Despite different methods of institutional regulation, the survey findings show that contract and working time flexibility is clearly on the increase in Europe. It is not just the range of ways in which working hours are being adapted but also the proportion of enterprises that are introducing these changes and the number of employees concerned that are increasing throughout the European Community. Levels and growth rates obviously differ in different Member States, but the general trend is undoubtedly towards an increase in and diversification of flexible working time methods. These national differences in the use of different forms of

contract and working time flexibility are shaped by major societal differences (economic and social regulation methods, legal and institutional framework, national traditions of industrial relations). The findings of the survey seem to show that the national context is more crucial here than differences in size or even in the sectors to which enterprises belong. With the exception of Great Britain and Sweden, overtime is tending to decline while other forms of flexible working time (part-time and shift work, weekend work, annualisation) are on the increase in all the countries studied. Little progress seems, however, to have been made with some forms of work such as homeworking and teleworking.

This marked trend towards the diversification of flexible forms of working time means that enterprises can now make a broader range of choices in order to adapt their work force needs to market requirements. From the point of view of employees, while it is true that diversified forms of flexible working hours give them greater freedom of choice, it should also be borne in mind that the development of some forms of working time seems to be exacerbating the duality between different labour market segments and worsening gender segregation. Flexible working time is often associated with lower pay levels and with less stable employment relationships. In parallel with the upturn in flexible forms of working time, there has also been an increase, whose level varies in different Member States, in fixed-term employment contracts. The survey findings would therefore seem to show that the diversification of working time is also being reflected by more flexible employment contracts and more precarious employment.

Analysis of the survey findings does not seem to confirm that there is a simple and clear-cut relationship between the growth of flexible forms of work organisation and levels of employment. Greater flexibility is an issue for enterprises increasing their staff numbers as well as for enterprises reducing them.

4.1.6 Comments

An approach based on micro-economics and monographs is clearly of interest as it makes it possible to pinpoint a certain number of circumstantial factors that shape the job sharing effect of a reduction of working time. These studies show in particular the important part played by methods of implementing reductions of working hours and by bargaining and the behaviour of economic operators. The micro-economic approach confirms, moreover, the important part that re-organisations of production methods and adaptations of working hours play in the impact of reductions of working time on employment. The studies analysed in this report distance themselves from a debate which too often bears the stamp of fixed ideological views. Based on interesting case studies, the authors of the various reports put forward convincing arguments about the conditions that need to be satisfied if a policy to reduce or adapt working

time is to have a positive effect on employment and to make enterprises more competitive. While the field surveys show that reduced working time agreements concluded at enterprise level may prove effective in maintaining or increasing employment and making enterprises more competitive, it is questionable whether these favourable cases can be transferred to other enterprises, sectors or even other Member States, whose institutional arrangements mean that negotiated compromises are harder to achieve. The representativeness of the enterprise sample selected should encourage readers to guard against any temptation to generalise the sometimes beneficial effects on employment, of the reductions of working time studied, to the economy as a whole.

In general, traditional micro-economic optimisation models (comparative statistical studies) show that a reduction of working time may, in certain circumstances, have positive effects on employment. Repercussions on the volume of personnel depend to a large extent on the size of adjustment costs (fixed costs) and the degree of comparability of the labour force, the possibilities of substitution between men and working hours and between capital and work force, the impact of the reduction of working time on equipment use times and lastly on levels of wage compensation. These studies rightly show that while there may in theory be positive effects on employment, the job sharing effect is based on very restrictive conditions which have little chance of being satisfied at the sectoral or macro-economic level.

The various studies analysed in this first section confirm that in order to promote employment reduced working time must be seen as part and parcel of a broader context covering production and work organisation. Changes in working hours seem in effect to be one of a number of factors in the overall restructuring of production methods and work organisation.

The transition from Taylorist methods of work organisation and management of production methods to post-Fordist methods is paving the way for the introduction of innovative and diversified systems of managing working time. It should be noted, however, that adaptations and modulations of working hours are not enough on their own to reduce working time. While some changes in work organisation may give rise to compromises leading in some cases to an actual reduction of working time (in return for the drawbacks of more flexible and variable working hours), the field surveys also show that adapting working hours does not necessarily lead to a reduction of working time. In other words, while changes in production organisation in most cases involve a re-organisation of hierarchical structures (delegation of responsibilities, greater autonomy), internal mobility and increased multiskilling, the removal of the link between the equipment use times and working hours, task rationalisation and therefore an overall improvement of the competitive position of enterprises, the trade-off between income growth and free time may vary from one enterprise or sector to another. Even in the case

examined here, i.e. the choice of reduced hours, it remains to be shown that reduced working time has positive effects on employment.

Factors of an institutional and political type may also limit the efficiency of collective policies to reduce working time. The efficiency of such policies is closely linked to the nature of industrial relations and relationships between the various social partners (government, employers and trade unions). It may well be that countries with centralised and coordinated bargaining systems and high levels of trade union representation within enterprises have more of a chance of reaching negotiated agreements to reduce working time likely to promote employment. While a high level of coordination and articulation of the various bargaining levels would seem, however, to be necessary, it is not enough on its own to ensure the success of a policy to reduce working time. Consequently, in addition to the evident problems of coordination between the various levels of social concertation (both national and European), the emergence of compromises promoting employment is strongly conditioned by operators' practices and the objectives that they support. It is far from evident that a collective reduction of working time will generate a convergence of interests that leads to increased employment. The balances to which negotiated reductions of working time lead may also prove to be less than optimum as regards employment. While it is generally accepted that a reduction of working time improves the well-being of employees (*insiders*), it has yet to be proven that the methods by which this reduction of working time is implemented, in particular the level of wage compensation, do anything for jobseekers (*outsiders*). Most supporters of job sharing often neglect these conflicts of interest and implicitly assume a solidarity between "insiders" and "outsiders", an assumption which seems to be very restrictive when viewed against the growth and permanent nature of mass unemployment. Uncertainties about the behaviour of the social actors in relation to wage compensation levels give rise to uncertain results in terms of employment. It is therefore crucial to take account of the conflicting objectives of the social actors and to look carefully at the circumstances that may pave the way for compromises that promote employment. Recent theoretical developments (see Autun and Cahuc 1998 and Grenier 1998) regarding bargaining models shed an interesting light on the uncertain impact of a reduction of working time on employment. These models show, in particular, that inadequate representation of the interests of the unemployed (*outsiders*) in collective bargaining and the structure of the preferences of people with jobs (*insiders*) as regards the trade-off between income and free time both run counter to job sharing.

While a policy promoting a negotiated and decentralised reduction of working time at enterprise or establishment level makes it possible to take account of the constraints specific to enterprises and to ensure that the reduction of working time is more in keeping with the enterprise's actual situation (principle of *subsidiarity*), its potential overall effect on

employment would nevertheless be limited. As D. Meulders and R. Plasman [11] stress, “*if there is no broad social consensus and labour market mechanisms making it possible to introduce these changes have not been set up, it is unlikely that coordinated measures to introduce a reduced full-time working week will be taken spontaneously or by decentralised adjustments*”. Collective reductions of working time by the authorities come up, however, against major organisational problems and presuppose that enterprises are very adaptable and that labour market adjustment mechanisms actually exist when in fact they may not.

4.2 Policies to reduce wage costs and reduce working time

As stressed above, theoretical collective bargaining models show that negotiated reductions of working time do not lead spontaneously to compromises likely to promote employment. The impact of financial incentives to reduce working time therefore need to be examined. In recent years, public financial incentive schemes combining a reduction of compulsory levies and a reduction of working time have been proposed and implemented in some Member States (France and Belgium). These public incentives to reduce working time have taken the form largely of partial exemptions from employers’ social security charges. The promoters of these schemes feel that they not only have the advantage that they trigger reductions of working time but also that they reduce enterprises’ production costs and therefore consolidate the effect of changes in working hours on employment (job sharing effect and competitiveness effect). Two studies commissioned by the European Commission [7] & [9] examine the impact of changes to the structure of compulsory levies, and in particular the impact of a modulation of social security contributions as a function of working time on employment and unemployment. The first study [7] advocates an offensive policy of job sharing and recommends a reduction of employers’ charges to promote a reduction of working time. The second study [9], conducted by the IFO Institute, and based on partially balanced micro-economic models (labour demand model), analyses, on the one hand, the effect of compulsory levies and fixed labour costs on the distribution of employment and working hours within enterprises and, on the other hand, the potential impact of a reduction/modulation of compulsory levies on enterprises’ recruitment practices.

4.2.1 Fixed labour costs and reductions of working time

In general, the effect of an increase in fixed labour costs (varying with personnel numbers and irrespective of working time) is to increase the marginal cost of employment while leaving the marginal cost of working hours unchanged. As stressed in the first chapter of this report, in the case of substantial indirect wage costs, an enterprise faced with a reduction of working time,

even without wage compensation, will therefore, for a given level of production, find it more advantageous to increase its employees' working time than to recruit new employees. All things being equal, moreover, the effect of an increase in fixed labour costs is to increase the working time that enterprises need to offset them and to generate a substitution of men for working hours that does little to promote employment.

The hypothesis of a link between working time, skill levels and fixed costs seems to be borne out by the fact that short part-time work is concentrated in sectors in which low-skilled jobs are in the majority and where there is considerable personnel turnover. By analogy with equipment use times which, in the case of enterprises that are very capital intensive, have to be long, levels of investment in human capital must also be correlated with working time. It may therefore be the case that the higher the skills required for the job, the more advantageous it will be for the enterprise to make extensive use of the work force.

4.2.2 Impact of compulsory levies on the distribution of working time

There are two types of system for employers' social security charges. The first type is generally one in which there is a constant hourly rate of social security contributions, the amount of contributions paid by the employer being proportional to the enterprise's wage bill. The second type, as well as levying social security contributions at a constant rate, introduces a gradation of social security charges after a certain pay ceiling. In this second type of system, the amount of social security charges paid by the employer increases with pay up to a certain ceiling and is fixed for employees whose pay exceeds this ceiling. In other words, the system of compulsory levies becomes regressive from a certain level of pay. An increase in the working hours of employees whose pay exceeds the ceiling does not have any impact on the amount of levies paid by the employer. Above the ceiling, the amount of social security contributions paid may therefore be seen as a fixed cost irrespective of working time and levels of pay. The marginal cost of an hour of overtime is therefore, in terms of compulsory levies, zero. Below the ceiling, compulsory levies may, in contrast, be seen as a variable cost.

From the point of view of the relationship between working time and the structure of compulsory levies, systems where there is a ceiling on employers' social security contributions tend to promote the recruitment of skilled personnel and to encourage enterprises to use overtime when payment for this overtime is over and above the ceiling. As Euzéby and Euzéby [7] note, the existence of a ceiling on social security contributions may also have an impact on entrepreneurs' choices between, for instance, full-time and part-time work. The lower the ceiling, the higher the additional costs that an enterprise has to bear when it creates part-time jobs. This discourages the development of this kind of job. Inversely, as a result of the

graduated nature of the ceiling, the lower the ceiling, the more advantageous overtime is for the enterprise.

4.2.3 The impact of a modification of the rates and structure of compulsory levies on working time and employment

➤ *Reduction of the hourly rate of social security contributions*

The effect of a general reduction of the hourly rates of social security contributions under the first type of scheme is to reduce enterprises' wage costs and generally to promote employment. As the relative costs of the various categories of employee remain unchanged, a reduction of employers' charges should not in this case generate a substitution between different categories of employee.

In the case of a system of compulsory levies with a ceiling on social security contributions, a reduction of the hourly rate of social security charges also promotes employment. For employees above the ceiling, a reduction of the hourly rate of employers' charges in particular entails a reduction of the proportion of fixed costs in the total and should therefore tend to reduce working hours and promote employment.

The overall effect on employment of a reduction of employers' charges is not, however, independent from the way this reduction is financed. The positive effects described above on the labour demand from enterprises implicitly presuppose budget neutrality. If the reduction of employers' charges is not fully financed and involves an increase in the other compulsory levies (VAT, income tax, etc.), the spin-off effect of the increase in these other compulsory levies should be taken into account when evaluating the net effects on employment and unemployment of a reduction of social security contributions. The spin-off effects on household consumption and labour supply need in particular to be studied in greater depth. Some studies (see Steiner, 1996) listed in the study by the IFO Institute [9] show that the net effect on employment in both the short and the long term of a reduction of social security contributions not accompanied by an increase in the tax burden are positive. In contrast, the same study shows that while the short-term effect on employment of a reduction of social security charges financed by an increase in VAT remains positive, the long-term effects are negligible or even negative.

➤ *Changes to the ceiling on social security contributions*

In the case of schemes with a ceiling on social security contributions, the effect of an increase in the threshold of social security contributions is to increase enterprises' wage costs but also to increase the proportion of overall production costs for which fixed labour costs account. In theory and in the likely case in which the pay of less-skilled employees is generally below the ceiling, raising the ceiling increases fixed labour costs for employees above the ceiling. Raising the threshold consequently modifies the relative costs of skilled and unskilled personnel in favour of the latter. Depending on the degree to which these two work force categories can be substituted, raising the ceiling on social security contributions should promote the increased employment of less-skilled workers. This reasoning is valid, however, only for a given level of production. An increase in wage costs may, on the one hand, encourage the enterprise to step up its capital intensity (capital and labour substitution) and, on the other hand, may have a negative impact on the volume of production because of the increase in unit production costs (loss of market). The new equilibrium of enterprises is therefore likely to be reflected by a re-allocation of employment to less-skilled workers and by a personnel volume that is smaller than in the situation prevailing prior to the change in the structure of compulsory levies.

In the extreme case, removing the ceiling from social security contributions should, by reducing the proportion of production costs for which fixed costs account, all other things remaining equal, have an impact on the distribution of working hours in which the hours worked by employees previously situated above the ceiling tend to be reduced. An increase in unit labour costs would tend, however, to have a negative impact on production volume and therefore on the level of employment. Removing the ceiling also brings about a change in relative costs in favour of less-skilled jobs, as the increase in the hourly cost of labour of better-skilled employees leads to a substitution in favour of the less-skilled. As above, the effect on the employment of the less-skilled depends to a large extent on hypotheses concerning the degree of substitution between different labour categories. If, as some empirical studies have attempted to show, the various personnel categories are complementary (in particular supervisory staff and other groups of employees), an increase in the wage costs of skilled jobs may bring about a concomitant reduction of numbers of skilled and unskilled workers.

4.2.4. Financial incentives to reduce working time and job sharing

Faced with the conflicting results of general and top-down policies to reduce working time on employment and unemployment, some Member States have introduced tax incentive schemes to encourage enterprises to reduce their working hours and to increase their personnel numbers. There are two such types of system. Under the first scheme, enterprises introducing measures to reduce working time receive subsidies. Criteria of recruitment or sustained employment generally have to be met to obtain these subsidies. This type of public aid has been introduced in France (Robien Law) and in Belgium (Global Plan). Under the second type of scheme, the hourly rates of social security contributions are modulated as a function of working time (Rocard proposal); a scheme of this type has yet to be applied. A modulation of the hourly rates of social security contributions means that all the hours worked below a certain threshold are subject to a subsidy proportional to the hourly wage and a levy that is also proportional to the hourly wage above this threshold.

Attempts to evaluate the efficiency of the first type of public scheme show, however, that only a minority of enterprises has responded to this incentive [see [6]]. This type of scheme, like policies to reduce wage costs (wage subsidy), is also very often associated with substantial windfall effects¹¹ that detract substantially from the efficiency of these financial incentives. While the effects of reductions of employers' charges on the propensity of enterprises to launch collective measures to reduce working time are not comparable, it would seem that such schemes have been more successful in developing certain individual forms of reduced working time, and in particular part-time work.

The IFO Institute [9] has attempted to estimate the expected effects on employment of the application of the Robien Law in Germany. The aim of the Robien Law was to encourage negotiated agreements on reductions of working time at enterprise level likely to promote employment (creation or safeguarding of jobs). Under this scheme, employers' social security contributions are reduced by 30% (40%) over six years in the case of a reduction of working time of 10 to 15% if the enterprise undertakes to increase staff numbers by 10% (15%). This reduction of social security charges would lead in Germany to a reduction of social security contributions by 5.6 points. Bearing in mind a long-term elasticity of labour demand of approximately 0.5%, the introduction of a scheme of this type in Germany (where 50% of contributions are paid by employees and 50% by employers, and where there is a ceiling) would increase employment by approximately 1%. Evaluation of the impact of the Robien Law

¹¹ The windfall effect measures the proportion of enterprises that would have changed their recruitment practices even if the scheme had not existed.

would therefore tend to show that the expected effects of such a scheme on employment in Germany should not be over-estimated.

The second scheme, advocated in 1996 by the Committee on Social Affairs and Employment of the European Parliament (Rocard proposal), involves a modulation of the hourly rates of social security contributions as a function of working time. The modulation involves an increase in the hourly rate of social security contributions for working hours above a predetermined threshold (32 hours) and a reduction of these rates for working hours below this threshold. In financial terms, compulsory levies are reduced by 1 ECU per hour for the first 32 working hours and increased by 4 ECU per hour above the 32-hour threshold. In the case of enterprises maintaining a 40-hour working week, the overall total of social security contributions paid by the enterprise does not change. One of the advantages of the scheme is therefore that it does not increase the compulsory levies paid by enterprises that do not change their working hours. Another advantage is that enterprises introducing measures to reduce working time can reduce their production costs and finance a certain degree of wage compensation. Unlike the previous scheme, this modulation of the structure of compulsory levies creates an increasing relationship between working time and average hourly rates of social security contributions and therefore between working time and unit labour costs. Depending on the rates of graduation of social security contributions and assuming that the average hours of the less-skilled labour force are shorter than those of the skilled labour force, the reduction of compulsory levies means that enterprises reducing their working time benefit from a decrease in the relative wage costs of less-skilled employees. In theory, it is therefore possible to encourage enterprises to reduce working time in a way that promotes employment, at least for less-skilled employees. A scheme of this type, assuming that it does manage to change enterprises' recruitment practices, nevertheless has a budget cost that should not be disregarded.

The IFO Institute [9] attempts to estimate the impact of the Rocard proposal on employment from German data (industrial workers). The application of a scheme of this type in Germany would tend to increase the hourly cost of labour of workers working over 32 hours by some 1.5%. The reduction of social security contributions for workers working less than 32 hours would reduce the hourly cost of labour by some 12%. Assuming that workers working over 32 hours are more skilled than those working below the 32-hour threshold and bearing in mind that the labour demand is more sensitive to a variation in the hourly wage of this latter group, the IFO study shows that the employment of skilled workers would fall by some 12 000 while the employment of less-skilled workers would rise by some 138 000. In the light of the estimates obtained, modulating social security contributions as a function of working hours would promote a re-allocation of the skilled labour force towards a less-skilled labour force

and would also encourage enterprises to reduce their working hours. As the authors of the report stress, these estimates should, however, be revised downwards. The results obtained in terms of employment depend to a large extent on hypotheses on the elasticity of labour demand with respect to the hourly wage adopted for the different labour categories. These estimates are also based on the very strong hypothesis of complete substitution between the two types of work force. These estimates lastly concern only labour demand and do not take account of any changes in the structure of compulsory levies on the labour supply in order to ensure budget neutrality. In other words, as the authors stress, the estimated effects presuppose a high degree of elasticity of the labour supply which is not borne out by the empirical studies conducted in this field.

4.2.5 Comments

In order to pinpoint the effects on employment of a combined scheme to reduce social security contributions and to reduce working time, it is necessary to describe a reference situation, which cannot by definition be observed, which shows what direction employment would have taken if the scheme had not been implemented. The literature on employment subsidies has clearly identified a range of side effects that reduce the efficiency of this type of system. Among these effects, windfall or dead-weight, displacement, cannibalism and substitution effects, to cite only a few, have been examined in detail and in some cases have proved to be very substantial (see Anxo 1995 and Gazier 1994), greatly limiting the efficiency of this type of scheme in terms of net job creation. In general, this type of subsidy distorts competition between enterprises. Looking here only at a modulation of social security contributions as a function of working hours, enterprises with a working time of less than 40 hours may improve their competitive position to the detriment of enterprises that do not reduce their working time¹². These windfall effects may have a negative impact on trends in employment in enterprises not eligible for the award of the subsidy.

Even in the favourable case where the scheme encourages enterprises to modify their working hours, it remains to be shown that this reduction of working time has a substantial impact on personnel volume. The reservations that we put forward concerning the job sharing effects of a reduction of working time also apply to this type of scheme. In any case, it may well be true that the impact of a reduction of working hours on recruitment is at best less than proportional to the reduction of working time. As noted above, moreover, if the reduction of working time is to be efficient it should not be accompanied by a reduction of capital use times. A re-organisation of the production process entails substantial costs and it remains to be shown

¹² In particular enterprises having a substantial proportion of part-time employees.

whether the reduction of social security contributions is enough to generate a re-organisation of production methods and a wage compensation which, as noted above, plays a large part in making a reduction of working time acceptable to employees. Like other tax incentive schemes (such as the Robien Law), a modulation of employers' contributions as a function of working time may have an impact on the timescale of processes of re-organisation, by speeding up these processes in enterprises that have planned them. Bearing in mind the relatively modest results of this type of scheme, the Rocard proposal may well have little effect on enterprises' recruitment practices and the efficiency of this type of scheme may be limited by substantial windfall effects.

The Rocard proposal also comes up against the problem of the heterogenous nature of the labour force and therefore the degree to which the various labour categories (skilled/unskilled, supervisory staff) can be substituted for one another. While, for instance, as some econometric studies have tended to show, supervisory staff and less-skilled employees are complementary, an increase in the wage costs of managers would also reduce the number of less-skilled personnel employed.

Another limit on the modulation of social security contributions as a function of working time is linked to methods of control by the public authorities. It can be assumed that this type of scheme gives rise to collusion between employers and employees involving manipulations of the threshold which are difficult for the public authorities to control. There is nothing to prevent employers from reducing their stated working time and failing to notify hours above the 32-hour threshold, and remunerating employees working below the threshold by perks not directly linked to their actual working time (benefits in kind, fringe benefits, etc.).

In theory, tax incentive measures to reduce working time may, under certain conditions¹³, be efficient in combating unemployment, especially of the less-skilled, provided that they generate an increasing relationship between working time and the average hourly rate of social security contributions (see, for instance, P. Granier (1998)).

This type of public action to promote job sharing policies should nevertheless be interpreted with care if it is not accompanied by an evaluation of their impact on public finances. An evaluation of this impact in particular requires an analysis of the consequences of such measures on overall unemployment and not solely on less-skilled employees.

¹³ In particular, sustained equipment use times and the existence of spin-off productivity gains linked to the reduction of working time.

On the favourable hypothesis where these systems, on the one hand encourage enterprises to reduce working time and, on the other hand, lead to negotiated compromises likely to promote employment and reduce unemployment, the tax surpluses (tax supplements) generated by additional recruitment may prove to be less than the public expenditure channelled into the reduction of social security contributions. It may well be, therefore, that such schemes modify the structure of compulsory levies with an increase in other types of taxation (or alternatively a reduction of public expenditure with no change to the tax burden). It therefore appears paramount, in order to evaluate the net effects on employment of a modulation of social security contributions, to analyse the impact of modifications of the structure of compulsory levies on wage formation methods (wage trends), the labour supply, household consumption and the potential substitution effects linked to an increase in the tax burden on growth, employment and unemployment.

As P. Granier (1998) rightly stresses: *“it would not in any case be possible to be satisfied by an argument putting forward the view that the financing of the scheme could be expected from the potential reduction of unemployment, an argument which, moreover, does not obviate the need for a comparison with alternative policies of identical budget cost”*.

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