

LONGER WORKING HOURS – THE BEGINNING OF A NEW TREND?*

A number of company-level agreements on longer working hours have recently been concluded in Germany. Such deals, for example, at Siemens and DaimlerChrysler have been widely publicised. The increases in working time have taken place without – or with only partial – pay compensation and thus represent cuts in hourly wages. They have in many cases occurred in response to employer threats of outsourcing production to lower-cost facilities abroad.

The working-time agreements in Germany have provoked a lot of debate, not only in that country but also in France as well as in other Western European countries. A key question is whether the German agreements imply a reversal of the earlier trend towards shorter hours that could spread to other countries as well. Potentially, this could happen both via psychological demonstration effects and via direct competitive pressures as production sites in different countries compete for jobs.

A controversial issue concerns the effects of longer working hours on jobs. It has been claimed both that a lengthening of working hours will raise employment and that it will reduce it. A related issue is whether or not an increase in working time will be an effective way of counteracting the future tendencies to falling labour supply in the ageing European societies (see Chapter 4 of this report).

This chapter analyses both the causes and the consequences of the recent working-time agreements in Germany. The aim is to align the discussion better with available research than has so far been done.

* We are grateful for comments on this chapter from Bertil Holmlund, Ann-Sofie Kolm, and Oskar Nordström Skans.

Table 3.1
Real income, labour productivity, and labour input in EU-15 in per cent of US levels

	1970	2002
GDP per capita	71	72
GDP per hour worked	65	90
Hours worked per capita	101	79

Source: Eurostat Structural Indicators (2004).

1. Background

Recent research on income differences among countries has shown that the main factor behind the higher income per capita in the US than in Western Europe is higher labour input, not higher productivity (Gordon 2002, OECD 2003, Blanchard 2004). This is illustrated by Table 1. Whereas GDP per hour worked in the EU-15 was 90 percent of the US level in 2002, the number of hours worked per capita in the EU-15 was only 79 percent of that in the US. The difference in income between the US and Western Europe was more or less unchanged between 1970 and 2002: GDP per capita in the EU-15 was about 70 percent of the level in the US in both years. The unchanged income differential, however, masks two offsetting developments. Over the 1970–2002 period, labour productivity in Europe increased relative to that in the US, reflecting considerably faster produc-

Figure 3.1

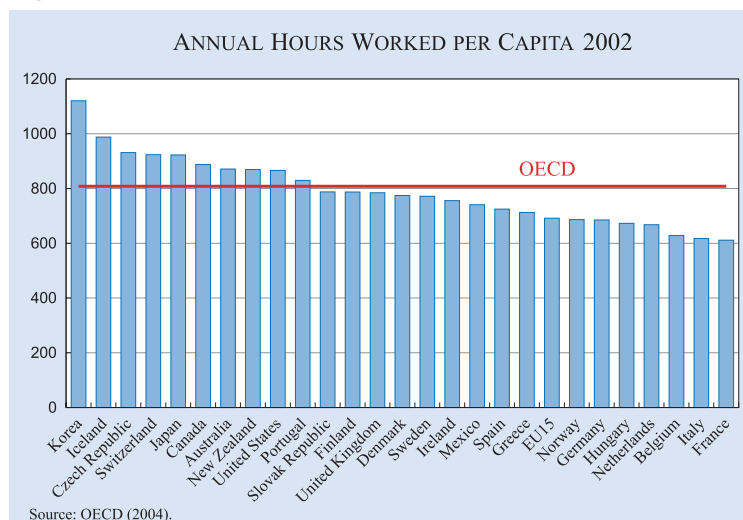
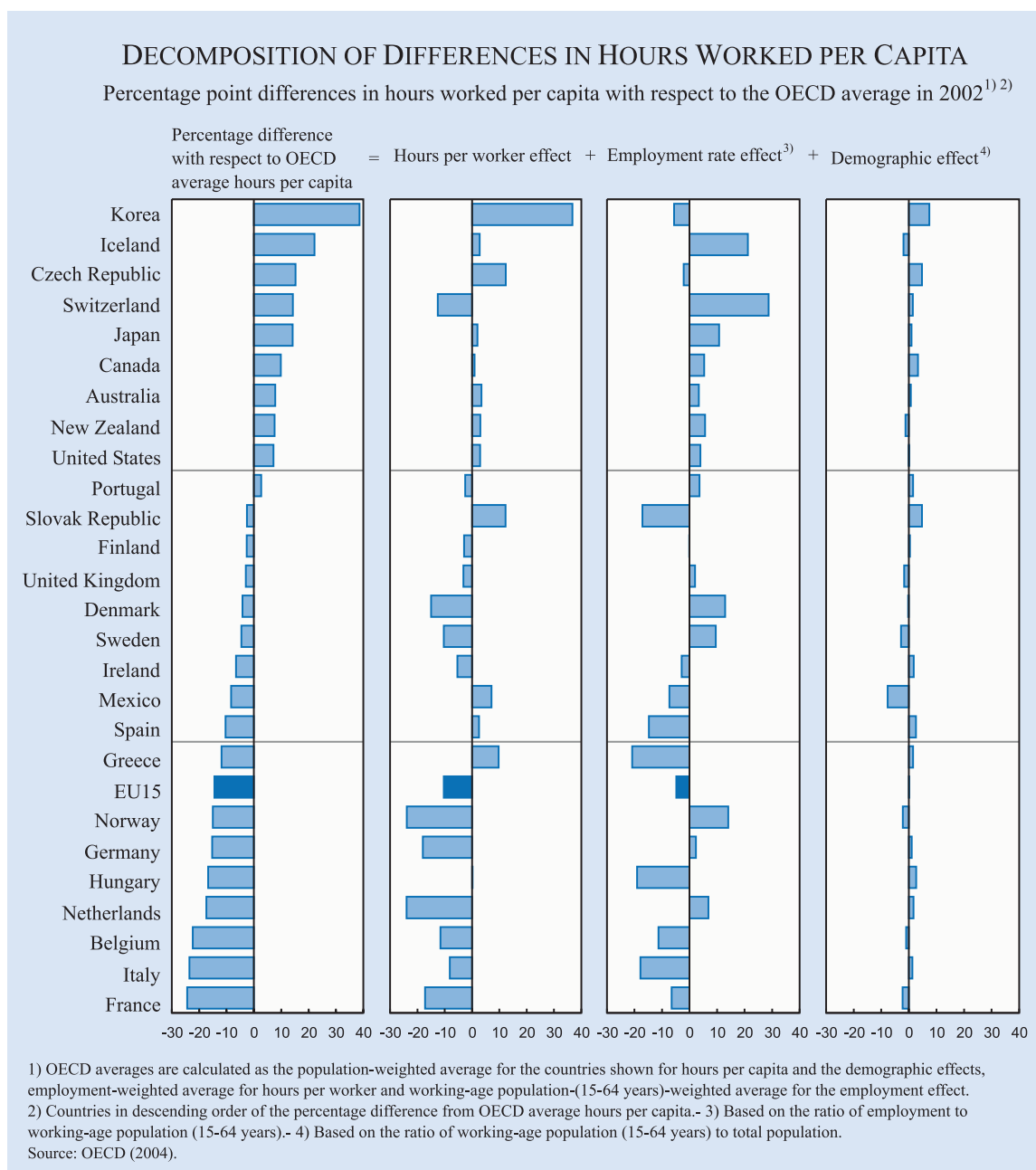


Figure 3.2



tivity growth up until the mid-1990s and somewhat slower growth after that. In contrast, hours worked per capita fell continuously in Europe relative to the US.

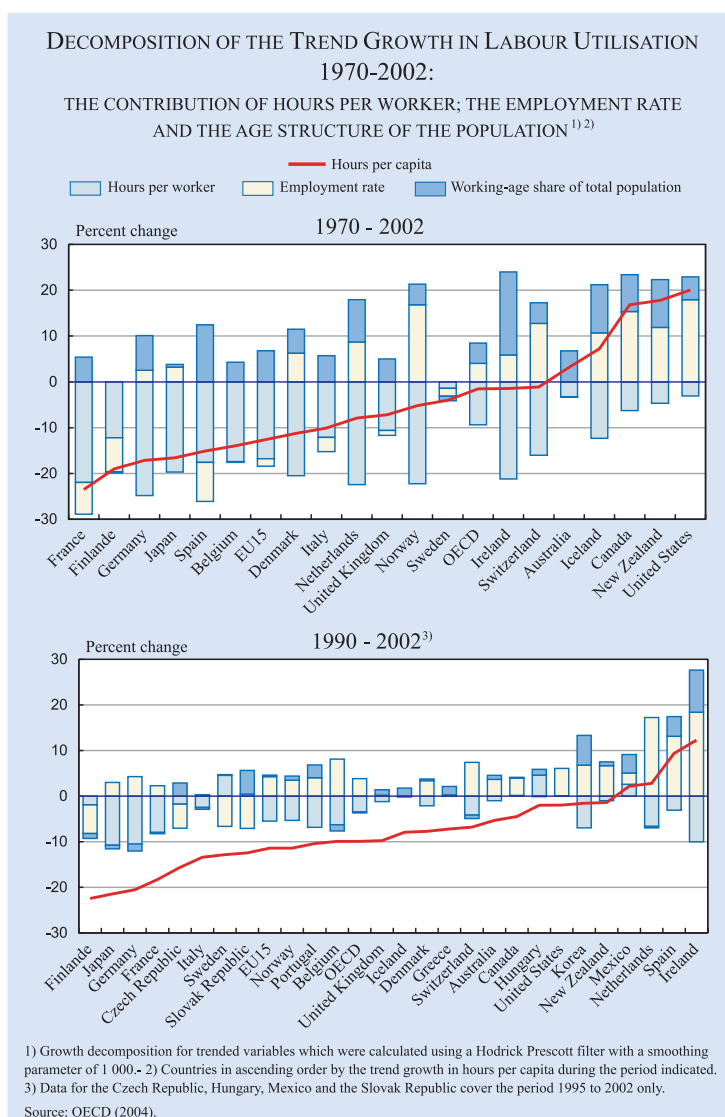
1.1. Working time in different countries

Figure 3.1 illustrates the differences in working time per capita among the OECD countries. The number of annual hours worked per capita is particularly low in some of the continental Western European countries (France, Italy, Belgium, the Netherlands and Germany) as well as in Hungary and Norway.

Figure 3.2 decomposes the differences in hours worked per capita among OECD countries into: (1) differences in hours per employee; (2) differences in the employment rate (the ratio of employment to working-age population); and (3) differences in demography (the ratio of working-age population to total population). A low number of working hours per employee is the most important factor behind the low number of working hours per capita in most of the European countries at the bottom of the diagram (France, Belgium, the Netherlands, Germany and Norway).

Figure 3.3 shows that hours per capita over the whole 1970–2002 period have declined in all OECD coun-

Figure 3.3



tries except the US, New Zealand, Canada, Iceland and Australia. Over the same period, hours per employee have fallen everywhere. The reductions have, however, been much larger in Western Europe than in the US (particularly so in Germany, the Netherlands, Ireland, Norway, France, Denmark Spain, Belgium, Switzerland, Denmark, and Italy). Most of the reductions in both hours per capita and hours per employee took place in the 1970–1990 period. Working hours per capita actually rose in about half the OECD countries in the 1990–2002 period, mainly because of rising employment rates. Working hours per employee continued to fall in most European countries but at a slower pace than before.

Actual hours worked per employee depend to a large extent on the incidence of part-time work, which we shall not discuss here.¹ It is clear, however, that low standard working time for full-timers is an important

explanation for the low working hours per employee in some Western European countries. This is illustrated in Table 3.2. Whereas annual standard working time for a full-time worker in 2003 was around 1900 hours in the US and around 1800 as an average in the new EU member states, the EU-15 average is only 1700 hours. The countries with the lowest annual standard working hours are France (1568), Denmark (1613), the Netherlands (1648), and (west) Germany (1648). As can be seen, the low annual standard working time in these countries reflects a short working week.

In general, actual working time exceeds standard working time. One reason is the existence of both paid and unpaid overtime. Another reason, when working time is determined through collective agreements, is that not all firms are covered by such agreements and that working time tends to be longer in non-covered firms. The average actual as well as standard weekly hours for a number of Western European countries are shown in Table 3.3.²

The UK shows the largest discrepancy between the two measures with actual weekly working time exceeding standard working time by as much as 6.1 hours, but there are sizable differences in Germany (2.5 hours), France (2 hours), the Netherlands (1.9 hours) and Spain (1.9 hours) as well. Countries with shorter standard hours tend to have larger differences between actual and standard hours. A similar pattern appears to exist also within countries, with, for example, a larger discrepancy between actual and standard hours in Germany in the metal and engineering sector, which has the shortest standard working time, than in other sectors (Lehndorff 2004).

¹ An increase in the incidence of part-time work can be associated with both rises and falls in working hours per capita. It will be associated with a fall if the employment rate is constant, but more employees choose – or are forced to choose – part-time instead of full-time work. It will be associated with a rise if it reflects an increase in labour market flexibility leading to a higher employment rate among the population.

² The table refers to 2002, which is the latest year for which we have data on actual working time.

Reductions in standard working time took place in a number of European countries in the 1980s and 1990s through either collective agreements or legislation. Table 3.4 gives an overview of cuts in the standard working week. The most far-reaching reductions took place in Germany and France. In Germany, the standard working week in the metal working and engineering industry was reduced from 40 to 35 hours in a series of collective agreements between 1984 and 1995. Working time reductions occurred also in most other sectors. In France, there were legislated cuts in the working week in 1982 (from 40 to 39 hours) and then again in 2000 and 2002 (from 39 to 35 hours). Cuts in the standard working week have also taken place in Austria, Belgium, Denmark, Greece, Hungary, the Netherlands, Norway and the UK.

1.2 Theoretical considerations

The differences in working time developments between Western Europe and the US over recent decades have initiated a lively research discussion. Basically, three types of theoretical explanations for these differences have been put forward.

- *Differences in preferences.* For example, Blanchard (2004) argues that the most important cause of the differences in the development in working hours between Western Europe and the US are basic differences in the preferences regarding labour and leisure. According to this interpretation, Europeans have a stronger preference for shorter working hours than Americans. This view has received some support from

Table 3.2
Standard working time for full-time workers according to collective agreements and/or legislation, 2003

	Per year, average for the whole economy	Per week, average for the whole economy	Per week, metal working
US ^{a)}	1904	40.0	-
Estonia	1840	40.0	-
Hungary	1840	40.0	40.0
Latvia	1840	40.0	-
Poland	1840	40.0	-
Slovenia	1816	40.0	40.0
Japan ^{a)}	1803	39.2	-
Ireland	1802	39.0	39.0
EU-8 (new EU states)	1801	39.6	-
Greece	1800	40.0	40.0
Malta	1776	40.0	-
Belgium	1748	38.0	38.0
Portugal	1748	39.0	40.0
Slovakia	1748	38.5	37.5
Germany (east)	1730	39.1	38.0
Spain	1729	38.6	38.5
Luxembourg	1728	39.0	39.0
Austria	1717	38.5	38.5
Cyprus	1710	38.0	38.0
EU-15	1700	38.1	37.9
UK	1693	37.2	37.3
Sweden	1676	38.8	40.0
Finland	1673	37.5	36.5
Italy	1672	38.0	39.1
Germany (west)	1648	37.4	35.0
Netherlands	1648	37.0	35.2
Denmark	1613	37.0	37.0
France	1568	35.0	35.0

Note: ^{a)}The figure refers to 2002.

Source: All countries except Japan and the US: *Working Time Developments* (2003), EIROnline;

Japan and the US: *Deutschland in Zahlen* (2004), Institut der Wirtschaft, Cologne

Table 3.3
Average actual and standard working time for full-time employees in EU-15, 2002

	Actual working time	Standard working time	Difference between actual and standard working time
UK	43.3	37.2	6.1
Greece	41.0	40.0	1.0
Spain	40.4	38.5	1.9
Portugal	40.3	39.0	1.3
Austria	40.1	38.5	1.6
EU-15	40.0	38.5	1.5
Sweden	39.9	38.8	1.1
Germany	39.9	37.4	2.5
Ireland	39.5	39.0	0.5
Luxembourg	39.5	39.0	0.5
Belgium	39.3	38.5	0.8
Finland	39.2	39.3	-0.1
Denmark	39.1	39.0	0.1
Netherlands	38.9	37.0	1.9
Italy	38.5	38.0	0.5
France	37.7	35.7	2.0

Source: Actual working time: *European Labour Force Survey* (2002); Standard working time: *Working-Time Developments* (2003), EIROnline.

survey studies of employee attitudes towards changes in working time (see Bell and Freeman 1994 and OECD 1998).

- *Higher tax wedges in Europe.*

An alternative explanation focuses instead on the differences in tax wedges between Western Europe and the US. Labour taxes are higher and have risen by more in Europe than in the US over the last three decades. In a calibrated model of the labour-leisure choices of households, Prescott (2004) finds that the whole difference in the development of working hours per capita between a number of large European countries and the US can be explained by the differential development of labour taxes. Olovsson (2004) obtains similar results for Sweden: focusing on households' choices between market work and "home production", he is able to explain all of the difference in working hours to the US with the higher Swedish tax wedges. These results are not undisputed however. Econometric estimates on panel data usually attribute a much smaller role to taxes in explaining the fall in hours per capita in Europe (Nickell 2003).

- *Higher coverage of collective agreements in Europe.*

A third possible explanation is the higher degree of unionisation and the larger role for collective agreements in Europe than in the US (see Chapter 3 of the 2004 EEAG report). Reductions in working time are a common objective of trade unions. Cuts in working hours can be viewed as a way of raising wages by restricting labour supply. They can also

Table 3.4
Major reductions in the standard work week in European economies, 1980–2004

	Year	Change	Legislation	Collective Agreements
Austria	1990	40 → 38,5		x
Belgium ^{b)}	1999	40 → 39	x	x (inter-industry agreement)
	2003	39 → 38	x	x (inter-industry agreement)
Denmark	1987	39 → 37		x (70% of employees)
France	1982	40 → 39		
	2000	39 → 35	x (large firms)	
	2002	39 → 35	x (all firms)	
Germany ^{a)}	1984	40 → 38,5		x (metal working and engineering)
	1987	38,5 → 37,5		x (metal working and engineering)
	1989	37,5 → 37		x (metal working and engineering)
	1993	37 → 36		x (metal working and engineering)
	1995	36 → 35		x (metal working and engineering)
Greece	1980	45 → 43	x	
	1981	43 → 42	x	
	1983	42 → 40	x	
Hungary	2003	40 → 38	x	
Ireland	1989-90	40 → 39		x (tripartite national framework agreement)
Netherlands	1982	40 → 38		x (Waasenaar agreement)
	1985	40 → 38	x (government civil servants)	
Norway	1987	40 → 37,5		x (blue-collar-workers in manufacturing)
UK	1979	40 → 39		x (engineering)
	1989-90	39 → 37		x (shipbuilding and engineering)

Notes:^{a)} Working time reductions also occurred in other sectors than in the metal and engineering sector during the 1984–98 period, but are not shown in the table. ^{b)} The entries in the table represent inter-industry agreements involving the government, which have been codified into law. The inter-industry agreements, have, however, only confirmed earlier concluded collective agreements at the sectoral level. For example, the reduction in the standard work week from 40 to 39 hours in such sectoral agreements took place mainly in 1980/81.

Source: EIRO Online; Institut der deutschen Wirtschaft;
<http://www.eiro.eurofound.eu.int/2004/03/feature/tn0403108f.html>
http://www.reformmonitor.org/downloads/brochure/refmon_e.pdf
http://www.reformmonitor.org/pdf-cache/doc_reports-cc-0-cm-3-cs-0.pdf
<http://www.reformmonitor.org/index.php3?mode=reform>
<http://www.issa.int/pdf/jeru98/theme2/2-1b.pdf>

be seen as a method of distributing the unemployment following from wages above the market-clearing level more evenly among workers. Indeed, ideas of work sharing have been an important factor behind the working time reductions in continental European countries. There is also empirical research (from the US) showing that a higher coverage of collective agreements co-varies with shorter standard working hours (Earle and Pencavel 1990). This finding is consistent with a positive correlation among countries between, on the one hand, the working time reductions that took place in the 1980s and early 1990s and, on the other, union density and the coverage of collective bargaining (OECD 1998). Recent observations from Germany also show that weekly working time has increased in firms that have withdrawn from employers' associations relative to firms that continue to be covered by a collective agreement (Kölling and Lehmann 2002).

2. The driving forces behind recent deals on longer working time

In 2004, several widely publicised agreements on longer working hours were concluded in large German companies. These deals followed a debate triggered by the Ifo Institute (Sinn 2003a, 2003b).³ An agreement at Siemens (involving two mobile phone plants) raised standard weekly hours from 35 to 40 hours without pay compensation. At Daimler Chrysler there was an agreement (involving one car plant) to gradually raise the weekly working time from 35 to 39 hours without pay compensation for some workers and to increase the threshold at which overtime premia start to be paid. Another deal, encompassing all Volkswagen plants in Germany, included, beside a wage freeze, both a rise in the standard working time by 1.5 hours without pay compensation (but with deferred compensation in terms of enhanced possibilities to retire earlier) and an effective reduction of the threshold at which overtime premia are paid. Agreements on longer working hours have also been concluded at, for example, the truck manufacturer MAN, the Thomas Cook tourist group, Lufthansa, and many small and medium-sized firms.⁴

³ See also a sizeable number of Ifo newspaper interviews on this issue as recorded on www.ifo.de.

⁴ An agreement on an increase in working time without pay compensation was also concluded in 2004 at the German-owned Bosch factory in Venissieux in France. Currently, longer working hours are being discussed as a cost-cutting measure at the German Opel factory in Rüsselsheim, which is competing within the GM concern with the Swedish Saab factory in Trollhättan about future car production.

The state governments in Bavaria and Hessen have increased the weekly working time for civil servants and discussions on similar increases are also taking place in other states.

The company-level agreements on longer working hours that have been concluded in the German metal working and engineering sectors were made possible by an opt-out clause in the latest industry collective agreement. The clause allows plant-level deals that deviate from the sectoral agreement on working hours in certain cases in order to safeguard jobs (Münchau 2004, EIROnline 2004). In line with this, several of the deals on longer working hours have also contained explicit employment guarantees on the part of firms and sometimes also commitments to invest in the existing production facilities.

The recent agreements in Germany have intensified the debate on working time in that country as well as in other European countries. It appears, however, that the discrepancy between actual and collectively agreed working hours in western Germany widened already in the second half of the 1990s. This is likely to have been the consequence of increases in working time both in firms leaving employers' associations and in firms encompassed by sectoral collective agreements but entering into deals with their employees in violation of these agreements (Lehndorff 2004; Zimmermann 2004).

The deals to lengthen working time are a response to pressures to reduce labour costs. High unemployment and international competitive pressures have, for a long time, exerted such pressures. The new feature is that employees are, to a larger extent than before, exposed to credible threats from employers that production sites will be closed down and jobs outsourced abroad, either to the new EU countries or elsewhere. This is a reflection of the ongoing "globalisation", which has progressively lowered the obstacles to international capital mobility (see the discussion in Chapter 2 of this report). The enlargement of the EU may represent a "discontinuous jump" in this direction: by increasing access to EU-15 product markets as well as promoting a more stable institutional framework, the expected returns to investment in the new EU states have increased and the risks associated with such investment decreased.

Against this background, there are two useful – and complementary – ways of viewing the company-level agreements on longer working hours in Germany: (1)

as a convenient way of reducing hourly wage costs; and (2) as an induced labour supply response to a reduction of the hourly wage.

2.1 Company deals on longer working hours as a way of cutting labour costs

Both real and nominal wages tend to be rigid downwards. Most employees are likely to resist cuts in real wages that endanger the consumption standards to which they are accustomed. The resistance to real pay cuts through reductions in nominal pay may be even greater, because psychological self-esteem of employees often seems to be linked more to nominal rather than real pay (Bewley 1999).

A lengthening of working time without pay compensation can obviously be a convenient way of reducing hourly wages, since it leaves the total pay per employee unchanged. No reduction in real consumption standards is then required. Nor has the nominal wage income per employee to be reduced. The option of reducing hourly wage costs through an increase in working time is likely to be seen as more favourable the shorter the working time is to start with, as marginal disutility of work is then lower. From this point of view it is logical that it is in Germany that working time increases have occurred.

Increases in working time at unchanged pay can give rise to very substantial cuts in hourly wages. For example, an increase in weekly hours from 35 to 40 hours represents a reduction of hourly wages by as much as 12.5 percent. An increase from 35 to 37 hours represents a reduction by 5.4 percent.

It is natural that the agreements to cut labour costs through longer working hours have come about at the company rather than the sectoral level. There are well-known obstacles to wage moderation at the latter level. Most union members in a sector will be employed “insiders”, whose jobs are not threatened. Hence, the majority of union members in a sector will be unwilling to concede across-the-board wage cuts in order to preserve threatened jobs in some firms or create new ones for the unemployed (which is a process that will take time and where the future winners cannot be identified *ex ante*).⁵ The incentives for wage moderation are, of course, much stronger at an indi-

vidual production site that the employer threatens to close down: then all the employees can be identified as “winners” already in the short run. For this reason, concession bargaining resulting in wage cuts in order to preserve existing jobs typically take place at the company level.

Chapter 3 of last year’s EEAG report pointed to the strong decentralisation forces set in motion by increased international competition. Employers in Western Europe used to be favourable to industry-level collective bargaining because it provided them with a level playing field, eliminating domestic competition in terms of wages. But this attitude reflected a situation where the bulk of competition was domestic. When competition instead is mainly international, the uniformity of national sectoral collective agreements prevents adjustment of wage costs to the specific competitive situation of the individual firm. One way of viewing the company-level agreements on working time (as well as other cost-cutting measures) is therefore as a kind of “decentralisation revolt” from below.

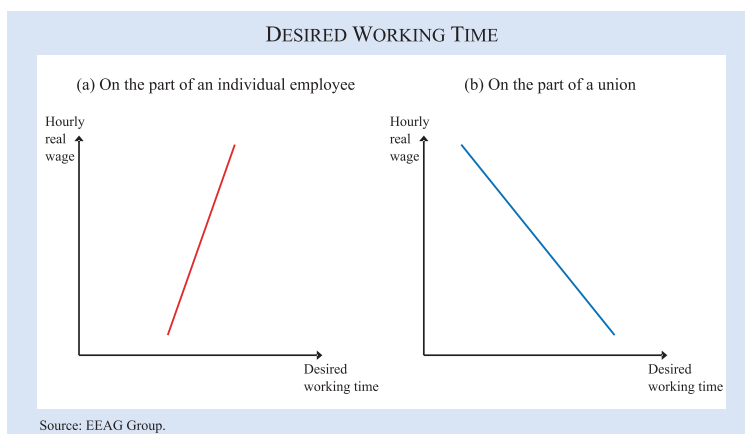
The agreements on working time at, for example, Siemens, DaimlerChrysler, and Volkswagen, have all included some form of employment guarantee from the employer. It is well-known from the theory of collective bargaining that bargaining between employers and unions over both wages and employment leads in general to more efficient outcomes (with higher employment) than bargaining only over wages (McDonald and Solow 1981; Layard, Nickell and Jackman 1991). The explanation is that simultaneous bargaining about both wages and employment allows greater possibilities of trading off wage restraint against higher employment. Centralised bargaining at the sectoral (or multi-sectoral) level is not consistent with such efficient bargaining over both wages and employment, since it would require mechanisms, which do not exist, for allocating the aggregate employment agreed at the centralised level among firms. This is the reason why such wage-employment deals are observed only at the level of the firm.

2.2 Longer working hours as a labour supply response to a real wage reduction

A complementary way of looking at the agreements on longer working hours is as a labour supply response to a reduction in hourly real wages necessary to preserve the competitiveness of domestic production facilities.

⁵ These obstacles to wage moderation at the sectoral level are similar to the political-economy obstacles to labour market reforms with the aim of promoting wage moderation at the national level. These obstacles were analysed in Chapter 2 of last year’s EEAG report.

Figure 3.4



Standard theory tells us that we should analyse the supply of working hours as the labour-leisure choice of individual employees (and/or as an issue of allocating time between market work and “home production”). According to standard analysis, a cut in the hourly wage has an income and a substitution effect. The income effect tends to increase the number of hours supplied, because the employee’s demand for leisure, as well as for all other goods, tends to fall when income is reduced.⁶ The substitution effect tends to reduce hours supplied, because (market) work becomes less attractive relative to leisure (and home production). Theoretically, one cannot tell which effect dominates, but empirical work suggests a small negative net effect of wage reductions on labour supply (for prime-aged males; the effect is larger for females).⁷ This is the same as saying that the labour supply curve is weakly positively sloped, as depicted in Figure 3.4a. According to this reasoning, one should thus expect a fall – and not a rise – in working hours as a response to a reduction in hourly wage rates.

However, the conventional labour supply framework is not the appropriate one for analysing recent increases in working time as these have resulted from collective, and not individual, bargaining between employers and employees. The appropriate framework is instead the theory of collective bargaining. It is standard to use this for analysing wage setting.⁸ According to this framework, unions try to trade off the benefits of real wage increases for the members who remain employed against the utility losses for the

members that become unemployed if wages are raised (too much). The utility loss from unemployment for a worker equals the difference between utility when employed (which depends on both wage income and working time) and utility when unemployed (which depends on unemployment benefits).

The theory of collective bargaining can also be used for analysing working-time decisions.⁹ Obviously, a union, which acts in the

interest of its members, will care about the labour-leisure trade-offs of employees. But unlike individuals acting alone, it will also be concerned about the effect of working-time decisions on the number of jobs: in the jargon of economists, a union internalises the effects of a change in working time of one union member on other union members. To provide more jobs (or prevent job losses), the union (workers acting collectively) has an incentive to restrict working time as compared to what workers would do when acting individually (Calmfors 1985, 1987; Holmlund 1987): given the hourly wage, shorter working time forces employers to satisfy their total demand for working hours by employing more workers. The desire of unions to hold back working time is a way of reducing the negative employment effects of wages that are set above the market-clearing level. The union incentive to restrict hours of work in order to raise employment is stronger, the more attractive it is to have a job (that is the higher the utility associated with a job).¹⁰

According to the described theory, unions will in general respond differently to changes in hourly real wages than individual employees acting on their own as regards desired working time. The ordinary income and substitution effects that arise for employees acting individually will also affect the desired working time on the part of a union. But there is also an additional effect. A cut in the hourly wage means that the attractiveness (utility) of holding a job decreases, since a job

⁶ This assumes that leisure is a so-called “normal” good.

⁷ See, for example, Aronsson and Walker (1997) for a recent review of empirical work on labour supply.

⁸ See, for example, Oswald (1985), Layard and Nickell (1991), Nickell and Layard (1999), Calmfors and Holmlund (2000), or Naylor (2003) for reviews of this literature.

⁹ Contributions to this literature include among others Calmfors (1985, 1987), Holmlund (1987), Earle and Pencavel (1990), and Booth and Ravaillon (1993).

¹⁰ Under some assumptions, legislative regulation of working time produces similar outcomes as collective bargaining. The reason is that employees – making up the political majority – have similar incentives to restrict working hours when they act as voters in the political process as when they act as members of a trade union. This has been analysed by Marimon and Zilibotti (2000), who show that legislation restricting working time relative to the “laissez-faire” outcome from bargaining between firms and individual workers is in the interest of workers.

then tends to be associated with a lower income. This effect weakens the incentive of a union to restrict working hours in order to promote employment and thus tends to counteract the ordinary substitution effect of a wage change on working time. Therefore, there are stronger forces working in the direction of increasing working time when there is a cut in the hourly wage if working time is determined in collective bargaining between unions and firms than when it is determined in bargaining between individual employees and firms.

Under some theoretical assumptions – most importantly that the total number of working hours demanded by employers depends only on the hourly wage rate but is independent of working time per employee¹¹ – the change-in-the-attractiveness-of-a-having-a-job effect on the desired working time exactly offsets the ordinary substitution effect for a union (Calmfors 1985). Hence, in such an analysis only the income effect remains, so that a reduction in the hourly wage must lead to an increase in working time.¹² This is equivalent to saying that the schedule showing how the desired working time of a union depends on the wage is negatively sloped, as shown in Figure 3.4b.

Our theoretical reasoning provides a possible explanation of the recent agreements on longer working hours in Germany. These are then viewed as an endogenous labour supply response in collective agreements to a required reduction in the hourly real wage. Provided that the hourly wage must fall, longer working hours, which help maintain members' incomes, are in the interest of unions.

3. The effects of working hours on employment and output

A key issue is how agreements on longer working hours of the type that have been concluded in Germany affect employment and output. The views in the public debate diverge fundamentally. Proponents of longer working time tend to argue that more jobs will be created, whereas opponents usually claim the

opposite. To sort out the arguments, it is important to distinguish between short-run and long-run effects. In a short-run analysis, one can take the reductions in hourly wages implied by the agreements as given. In a long-run analysis, one must consider how wage-setting incentives will respond over time to longer working hours: in long-run equilibrium, aggregate employment must be such that the parties to wage bargaining have an incentive to set wages that are consistent with the return to capital required by the international capital market.

3.1 Short-run employment and output effects of longer hours

To illustrate the short-run effects of longer working hours, it is instructive to analyse a very stylised example. Think of a profit-maximising firm that produces an output the price of which the firm cannot affect. This would, for example, be the case if the firm is one of many producers of an identical good in the world market. To begin with, assume that the physical capital stock as well as the degree of capital utilisation in the firm are given. Assume also that hours and workers are perfect substitutes to the firm, so that it is indifferent to whether a given output is produced by more employees working fewer hours per employee or by fewer employees working more hours per employee.

How would employment in such a firm respond to an increase in working time at unchanged pay per worker, where the pay per worker is the product of the hourly wage and the number of working hours? The firm employs workers up to the point at which the productivity of the marginal worker (the increase in output from an additional worker) equals the pay of a worker. The effect on employment of an increase in working time at unchanged pay depends on whether the productivity of a marginal worker rises or falls. There are two counteracting effects.

- On the one hand, the productivity of a marginal worker tends to increase when he/she works more hours.
- On the other hand, the productivity of a marginal worker tends to fall because longer working time for all workers implies a lower productivity of the marginal hour (the increase in output from an additional hour worked). The reason is that the productivity of the marginal hour depends positively on the ratio between capital and the total number of hours worked (the number of workers \times

¹¹ This is equivalent to assuming that working hours and workers are perfect substitutes (within a relevant range), so that employers are indifferent to whether a given output is produced by fewer employees working more hours or more employees working fewer hours. See Section 3.1 below.

¹² The implicit assumption is then again that leisure is a “normal good”, that is a good for which demand increases when income increases. A similar theoretical result as above holds when working time is determined through legislation and employees make up the political majority. See also footnote 10.

working time) and that this ratio tends to fall when working time increases.¹³

The net effect on the productivity of a marginal worker of an increase in working time depends on which of the two effects dominates. If the productivity of a marginal hour falls only slowly when hours increase, the first effect dominates and the productivity of a marginal worker increases. This makes it profitable for the firm to increase employment. If instead the productivity of a marginal hour falls quickly as hours increase, the second effect dominates, so that the productivity of a marginal worker falls and the firm reduces employment.

What is clear, however, is that, independently of how the number of workers is affected, output increases. This follows because a profit-maximising firm chooses the total number of hours worked such that the productivity of a marginal hour worked equals the hourly wage. Obviously, when the hourly wage falls, it becomes profitable for the firm to increase the total number of hours.

Another way of thinking about the employment effects of a lengthening of working time at unchanged pay per worker is in terms of the wage elasticity of labour demand (the percentage increase in the total number of working hours demanded by the firm when the hourly wage falls by one percent). As discussed in Box 3.1, the condition for an increase in working time at unchanged pay per worker to raise employment in our stylised example is that the labour demand elasticity exceeds one (see also Sachverständigenrat 2003). When the capital stock is fixed, the labour demand elasticity equals the ratio between, on the one hand, the elasticity of substitution between capital and labour and, on the other, the profit share in output. Typical values for these parameters are 0.6 and 0.3, respectively, which would give a labour demand elasticity of around two. This presupposes, however, that the firm can restructure the given capital stock and adopt more labour-intensive production methods. Since this may be a time-consuming process, the elasticity is likely to be well below unity in the short run (say within a year). This could be taken to suggest that, in the short run, the output increase achieved through longer working hours must be

bought at the cost of a reduction in employment. This conclusion does not follow, however. There are two main reasons for this. The first is that the degree of capital utilisation is likely to increase when working time increases. The second reason is that longer working time could affect the size of the capital stock.

Working time and the utilisation of capital

It is important to distinguish between the physical capital stock and the capital services produced by this physical capital stock – just as we distinguish between the “stock” of workers employed (employment) and the labour services produced (the total number of hours worked). The volume of capital services depends on the degree of utilisation of the capital stock, that is on the length of time during which the capital stock is operated (the operating time). It is reasonable to assume that longer working time for employees increases the operating time of capital. This can indeed be seen as one of the major advantages of longer working hours since it implies an output increase similar to that of an otherwise cumbersome accumulation of capital (Sinn 2004a, 2004b). The increase in the volume of capital services produced by a given physical capital stock counteracts the tendency to a fall in the productivity of a marginal hour when the working time of all employees increases and thus makes a positive employment effect much more likely (see Box 3.1).

A special case of interest is when the operating time of capital equals the working time of employees. This holds when there is no shiftwork (or, more generally, no overlapping of the working times of different employees in order to lengthen operating time relative to working time). In this case, the productivity of a marginal hour is independent of working time: a *ceteris paribus* change in working time changes the amount of capital services (operating time x the physical capital stock) and the total amount of labour (working time x the number of workers) proportionally by as much and therefore leaves the ratio between the amount of capital services and the total input of labour unchanged. The productivity of a marginal hour then depends only on the ratio between workers and physical capital. Under these conditions, it follows that an increase in working time at unchanged pay per worker must always raise employment: the productivity of a marginal worker, to be set against the constant pay, increases proportionally by as much as working time. This happens already in the short run without any need for restructuring of the capital stock and adoption of new production methods.

¹³ Here, as well as below, we make the standard assumption that the production function exhibits constant returns to scale: a, say, ten percent increase in the inputs of both capital and labour (the total number of hours worked) increases output also by ten percent. Under this assumption, the marginal products of both labour (hours) and capital depend only on the capital-labour ratio.

Box 3.1**Some formulas for the short-run employment effects of longer working hours at unchanged pay per worker**

If (1) a firm produces output with the help of (a fixed) capital (stock) and labour, (2) hours and workers are perfect substitutes in production within the ranges of variation in hours and employment that are relevant, (3) there are no fixed costs of employment (costs that are fixed per worker independently of the length of working time), (4) there is a given output price at which the firm can sell all that it produces, and (5) employment is determined by the demand for workers, the following formula for the employment effect of an increase in working time at unchanged (nominal) pay per worker applies:

Percentage change in the number of workers = Percentage increase in working time \times (Elasticity of labour demand with respect to the hourly real product wage $- 1$).

The elasticity of labour demand measures the percentage increase in total working hours demanded when the hourly real product wage falls by one percent. The real product wage is the wage in units of the firm's own output, that is the ratio between the nominal wage and the output price. With a given output price, the percentage change in the nominal wage equals the percentage change in the real product wage.

The formula is easy to understand. If the hourly wage were held constant (which implies that the total number of hours worked = employment \times working time is also constant), then a one percent increase in working time would reduce employment by one percent: a direct negative "work-sharing effect". But when instead the lengthening of working time takes place at unchanged pay per employee, a one percent increase in working time implies a one percent decrease in the hourly wage. Hence, there is a percentage increase in the total number of hours worked which equals the elasticity of labour demand. The percentage change in employment is obtained as the difference between the percentage increase in total hours due to the fall in the hourly wage and the one percent reduction in employment that would occur at an unchanged hourly wage.

When the operating time of capital depends on the working time of employees – so that the total amount of *capital services* produced by the fixed capital stock increases when working time increases – and the production function exhibits constant returns to scale, the change in employment following from an increase in working time at unchanged pay can be reformulated as:

Percentage change in the number of workers = Percentage increase in working time \times (Elasticity of labour demand with respect to the hourly real product wage $+ Elasticity of operating time of capital with respect to working time - 1$).

The difference to the first formula arises because, with a constant-returns-to-scale production function, a one percent increase in the volume of capital services increases the total number of working hours demanded also by one percent. The percentage increase in the operating time following from a one percent increase in working time is given by the elasticity of operating time with respect to working time. The larger is this elasticity, the greater is the probability of a positive employment effect.

In the special case when the operating time of capital equals working time, the elasticity of operating time with respect to working time is unity and the formula becomes:

Percentage change in the number of workers = Percentage increase in working time $\times Elasticity of labour demand with respect to the hourly real product wage$.

In this case, an increase in working time at unchanged pay per worker always increases employment. The direct negative "work-sharing effect" on the demand for workers of longer working time is exactly offset by an increase in demand associated with the increase in the volume of capital services following from longer operating time. So, the only remaining effect on employment is the increase that follows from the lower hourly wage.

The formulas above have rested on the assumption that the *real* pay of a worker in terms of the price of output produced is unchanged when working time increases. If the output price is given, constant *nominal* pay also holds real pay constant. Most firms cannot, however, sell an increase in output neither in domestic nor in world markets at an unchanged price. Instead, prices must be lowered relative to competitors in order to gain market shares. Such a relative price decrease is indeed the optimal response of a profit-maximising firm to a reduction in its relative wage cost vis-à-vis competitors. One has then to distinguish between changes in the nominal and in the real product wage, as a given percentage reduction in the nominal wage is associated with a smaller percentage reduction in the real product wage (the nominal wage deflated by the firm's own output price) when the output price falls, too.

An analysis of the employment effects of an increase in working time with constant *nominal* pay per worker in the case when output prices fall, thus requires a slight change in the formulas: the elasticity of labour demand with respect to the real product wage has to be multiplied by the *elasticity of the real product wage with respect to the nominal wage* (the percentage reduction in the real product wage when the nominal wage falls by one percentage point). The latter elasticity is a positive number below unity (but closer to unity, the closer substitutes in demand the outputs of different firms are). It follows that a higher elasticity of labour demand with respect to the real product wage is required for employment to rise when working time is increased at constant nominal pay per worker when the output price is flexible than when it is fixed. The conclusion that employment always increases when the operating time of capital equals the working time of employees still holds however.

Therefore, it pays unambiguously for the firm to hire more workers.

Working hours and the size of the capital stock

A second reason why an increase in working time at unchanged pay could have a positive employment effect already in the short run is that the physical capital stock may not be fixed, even over this time horizon, but may respond to wages. Indeed, this is exactly the case when employees are (credibly) threatened by a closedown of the production site and an outsourcing of jobs abroad unless wage costs are lowered. Then the short-run wage elasticity of labour demand is *infinite*, that is *all* jobs will disappear unless hourly wages are cut. This is not, of course, the usual situation in most firms, but it will be the situation at some firms at some points of time: for example, when a car maker makes a “one-shot” decision on at which location to invest in the production of new car models that will replace older ones. Such one-shot investment decisions seem indeed to have been part of the picture in connection with some of the recent agreements on longer working hours in Germany.

There is an additional advantage of an increase in working time over a longer time horizon. As the output increase that occurs with fixed pay per worker implies an increase in profits, firms may accumulate capital out of the retained earnings and expand their capital stock faster than would otherwise be the case.

Other considerations

A full analysis needs to consider a number of additional aspects. One is the use of overtime. Economic modelling explains the use of (paid) overtime with the existence of fixed costs of employment, that is costs per employee that are independent of the length of working time (these include the daily set-up and closing-down costs as well as in-work benefits and costs for training, human resource management, hiring, and firing etc.). Employers have an incentive to economise on these fixed costs through the use of overtime. More exactly, employers trade off the reduction in hourly wage costs that can be achieved by spreading the fixed employment costs over more hours against the rise in costs associated with overtime wage premia and the reduction in each worker’s productivity per hour that will ultimately set in when overtime increases.

An increase in standard working time (above which overtime premia are paid) reduces the cost of a marginal standard hour (provided by a marginal worker)

relative to the cost of a marginal overtime hour (provided by an intra-marginal worker), because fixed employment costs are spread over more standard hours. Employers then have an incentive to substitute workers for overtime hours,¹⁴ which will add to the positive employment effects arising from the incentives to expand output when hourly wages fall. It is difficult to evaluate how important these effects are. Several studies have indicated that actual working hours have fallen as much as standard hours when earlier reductions in working time took place.¹⁵ On the other hand, it appears, as discussed in Section 1.1, that the difference between actual and standard working time is larger in countries and in sectors with shorter working time.

Another complication is that the amount of shift-work, or more generally the relationship between the operating time of capital and the working time of employees may be influenced by an increase in working time. According to Calmfors and Hoel (1989), an increase in working time makes it profitable for employers to substitute workers for shiftwork.

Yet another aspect is that different types of labour may be complements in production. To the extent that this is the case, an increase in working time of, say, specialists who are in short supply may remove bottlenecks in production that increase the demand for other types of labour.

A final consideration concerns the product demand side. A frequently asked question is how a firm can find the additional product demand to accommodate an output increase in response to longer working hours at unchanged pay per worker. In our stylised examples with perfectly competitive product markets, this additional demand would be automatically forthcoming as each firm is so small that it could sell any amount of output at the going market price. In a more realistic setting, the firm would have to reduce its output price relative to competitors in order to gain a larger share of the market. Indeed, this would be the profit-maximising response to the reduction in the marginal production cost that takes place when the hourly wage falls.

However, the need for a firm to cut prices in response to an increase in working time is lower, the larger is

¹⁴ See Calmfors and Hoel (1988).

¹⁵ This is the result in, for example, Hart and Sharot (1978), De Regt (1988), Hunt (1999), and Kalwij and Gregory (1999). An exception is Nordström Skans, who found that reductions in standard working time for shift workers in Sweden had only a partial effect on actual working time.

the number of firms that simultaneously increase their output. More output with given pay per worker means higher profit incomes, and higher profit incomes imply higher expenditure of firms and their owners on other firms' products. In a closed economy, prices on average might not have to fall at all in order to accommodate the output increase, even though relative prices would have to change so as to match the structure of additional demand with the structure of additional output. But in an open economy, which sells some of its products abroad and imports foreign products, a decline in the relative product price vis-à-vis other countries (a real exchange rate depreciation) would be an inevitable and optimal response to the increase in working time.

Summarising our discussion of the short-run effects of longer working time at unchanged pay, it is clear that the total number of hours worked, and thus also output, increase. Whether or not the number of employed workers also increases depends on the situation of the individual firm. When the alternative to the agreements is a closing-down of production facilities and an outsourcing of jobs abroad already in the short run, the employment effects are by definition positive. They are also positive in firms where this is not the case, provided that an increase in working time leads to a large enough increase in the utilisation of the capital stock. But in other firms, the short-run employment effects are likely to be negative.

3.2. Long-run effects of working hours on employment and output

What would be the consequences for output and employment in the long run of an economy-wide increase in working time? This question requires an analysis of how both wage-setting incentives and long-run capital accumulation are affected.

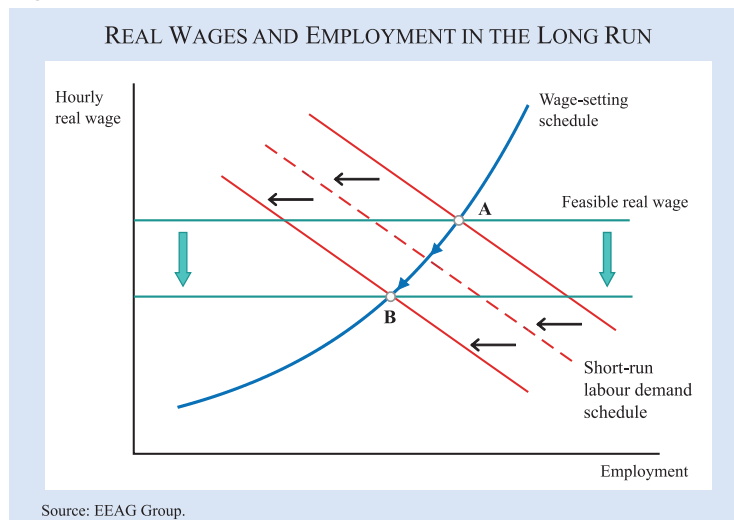
The following analysis can serve as a benchmark for thinking about the issue. In the long run, the return to capital in the international capital market ties down the domestic return to capital in any open economy. With capital mobility, the capital stock in each country adjusts over time until it obtains the internationally determined rate of return (adjusted

for differences in risk among countries). If we, to begin with, again assume a given degree of capital utilisation, this in turn ties down the domestic hourly real wage.¹⁶ The world market return to capital thus determines the hourly real wage that is *feasible* in the long run. A higher hourly wage than the feasible one would result in a progressive reduction in the capital stock, and a lower wage in a progressive increase.

In long-run equilibrium, wage-setting behaviour has to be consistent with the rate-of-return requirements imposed by the international capital market. Aggregate employment must be such that it gives the parties in wage bargaining an incentive to choose the feasible hourly wage. An analysis of the long-run employment consequences of a change in working hours should therefore focus on how wage-setting behaviour is influenced (see, for example, Layard, Nickell and Jackman 1991; Nickell and Layard 1999; or Calmfors and Holmlund 2000). If, for example, longer working time leads to less pressure to increase hourly wages, lower unemployment is needed in equilibrium to discourage wage setters from raising the hourly wage above the feasible level.

¹⁶ The assumption of constant returns to scale in production is crucial for this result. In long-run equilibrium, domestic firms use capital up to the point where the marginal product of capital is equal to the real return to capital. Hence, a given real return to capital in the world market determines the ratio between labour (the total number of hours worked = employment x working time) and capital (as the marginal product of capital depends on this ratio). Labour is used up to the point where the marginal product of labour (hours), which also depends on the capital-labour ratio, equals the *hourly* real wage. It follows that the internationally determined return to capital also determines the hourly real wage. The requirement that the domestic real return to capital (the nominal return deflated by the output price) must equal the world market *real* return under perfect capital mobility presupposes that domestic output prices follow foreign output prices, which is a reasonable benchmark in the long run.

Figure 3.5



Source: EEAG Group.

A diagrammatical analysis

The analytical framework is illustrated in Figure 3.5. The axes of the diagram show the hourly real wage and the number of employed workers, respectively. The horizontal line shows the long-run feasible hourly real wage, which is determined by the world market return to capital. The line can also be interpreted as a (completely elastic) long-run labour demand schedule. It should be distinguished from the short-run labour demand schedule, which is downward-sloping and the position of which depends both on the length of working time and the size of the capital stock (which for the economy as a whole is fixed in the short run).

The upward-sloping curve is a wage-setting schedule: it shows how higher aggregate employment gives wage setters an incentive to set a higher hourly wage (because the bargaining position of employees in each firm/sector is strengthened when there are more alternative employment opportunities available). The intersection of the horizontal line, showing the feasible real wage, and the wage-setting schedule is the long-run equilibrium. In the long run, the capital stock adjusts, so that also the short-run labour demand schedule passes through the intersection of the other two schedules.

One can think of “globalisation” and EU enlargement as an increase in the required long-run return to capital in Western Europe (and Germany), because real capital investment overseas, yielding higher returns, is now an option. This implies a reduction in the feasible hourly real wage, that is a downward shift in the horizontal line in Figure 3.5. At the initial equilibrium at A, a discrepancy between the domestic and the foreign returns to capital arises and capital is moved out. If the current account was initially in balance, the capital outflow is reflected in a current account surplus (as is now the case for Germany and EU-15). This shifts the short-run labour demand schedule gradually to the left. As a consequence, the hourly wage falls.¹⁷ This process continues until the capital stock has fallen so much that a new equilibrium is reached at B, where the domestic and foreign returns to capital are again equal. At B both employment and capital stock are lower than in the original equilibrium. Therefore output is also lower.¹⁸

¹⁷ A more elaborate analysis would distinguish between different categories of workers. It is then quite likely that only the wage of unskilled workers falls, whereas the wage of skilled workers could rise. See the discussion of outsourcing in Chapter 2.

Suppose now that working time increases in response to the fall in the feasible hourly wage. How would this affect the long-run equilibrium? In our example, the increase in working time has no repercussions on the feasible hourly wage, as this is uniquely determined by the international return to capital. Therefore, the long-run effect on equilibrium employment depends only on how the wage-setting schedule is affected. If it is left unchanged, equilibrium employment is unaffected. The effect will then simply be that the capital stock and output increase proportionally by as much as working time (compared to what would otherwise be the case).¹⁹ If the wage-setting schedule shifts downwards, equilibrium employment increases relative to the situation in B. This implies an increase in output that is proportionally larger than the increase in working time. If the wage-setting schedule instead shifts upwards, equilibrium employment is reduced and output increases proportionally less than working time and may even fall.

There will be a one-to-one correspondence between the effects of a change in working time on wage-setting incentives and on long-run equilibrium employment only if the degree of capital utilisation is not affected. The analysis becomes slightly more complicated if we, as in Section 3.1, take into account that longer working time may also increase the operating time of the capital stock. The reason is that such an increase would raise the feasible hourly wage. The intuition is straightforward. If there is an internationally required return to (physical) capital, an increase in the operating time of capital reduces the cost of capital services (the cost per operating hour of the capital stock). This makes it profitable for firms to use more capital services relative to labour. Such a more capital-intensive production raises the productivity of

¹⁸ If a fall in employment is to be avoided, the wage-setting schedule must shift downwards by a sufficient amount. A downward shift occurs, for example, if unemployment benefits are reduced, as this makes unemployment more unattractive and hence provides a stronger incentive for wage restraint. Such a reduction in the benefit level takes place automatically if benefits are indexed to wages. The output decrease associated with the movement from A to B in the diagram should be interpreted in a comparative-static sense only. In a growing economy, output at the time the economy has moved to B might be higher than at the time the economy was in A, but it would be lower than would be the case without a fall in the feasible real wage.

¹⁹ The hourly real wage given by the lower horizontal line in Figure 5 has to equal the marginal product of labour (hours), which depends on the ratio between capital and the total amount of labour (working time x employment). Longer working time at constant employment implies a larger total amount of labour. Hence, the capital stock has to increase by proportionally as much to keep the marginal product of labour equal to the given hourly wage. Thus, for example, ten percent longer working time implies ten percent higher total labour input and hence also ten percent higher capital stock in equilibrium than would otherwise be the case. Then output must also be ten percent higher. See, for example, Layard, Nickell and Jackman (1991) and Konjunkturinstitutet (2000).

the marginal working hour and thus makes a higher hourly wage consistent with equilibrium in the international capital market. If this occurs – so that the horizontal line in Figure 3.5 shifts upwards again – an increase in working time would have a positive effect on long-run equilibrium employment also in the case of an unchanged wage-setting schedule.

Theoretical analysis of working time and wage-setting incentives

Our discussion above has shown that the long-run employment effect of longer working hours depends critically on how wage-setting incentives (in terms of the choice of hourly wages) are affected. What do we know about this? Theoretical analysis has pointed to a number of reasons why an increase in working time could give incentives for wage moderation.²⁰

- With longer working hours, employees can attain a given total wage income with a lower hourly wage.
- Since longer hours at a constant hourly wage would be associated with higher wage income, they tend to make employment more favourable to the individual employee as compared to unemployment. This works in the direction of making unions more concerned about preserving jobs and therefore provides an incentive for them to accept lower hourly wages.
- An increase in working time increases the share of variable wage costs (wages paid in proportion to working time) relative to fixed costs per employee in total labour costs. This makes both employment and profits more sensitive to increases in the hourly wage. Hence, the costs of a wage rise in terms of lower employment (for unions) and lower profits (for employers) increase. As a consequence, there are incentives on both sides of the labour market to choose lower hourly wages.
- Firms may be using high wages as a device to enhance the efficiency of the labour force, for example to discourage quits and in this way keep down hiring and training costs that reduce workers' net productivity. By increasing output per worker, longer working hours may weaken the incentive of employers to set high hourly wages for such efficiency-enhancing reasons.

However, the literature has also identified effects through which longer working hours tend to strengthen the incentives for high hourly wages:

- Longer hours mean more disutility from work, which works in the direction of making employment less favourable to the individual union member as compared to unemployment. This tends to make unions less concerned about jobs and thus provides an incentive for higher hourly wages on their part.
- Longer working time per employee also means that the reduction in the number of working hours demanded caused by a rise in the hourly wage is associated with a smaller fall in the number of jobs. This reduces the price of wage increases in terms of lost jobs and thus weakens union incentives for wage restraint.

As there are counteracting effects, theoretical analysis cannot give a clear-cut answer to how changes in working time affect wage-setting incentives. The conclusions depend on the exact assumptions made, although there seems to be a bias in the theoretical research towards the conclusion that longer working hours lead to more wage restraint, in which case long-run equilibrium employment must increase. There is also a presumption that this outcome is more likely, the lower is working time initially.

Empirical analysis of working time and wage-setting incentives

There has also been a fair amount of empirical research on the effects of changes in working time on wage setting.

Several studies have included working time as an explanatory variable in wage equations estimated on macroeconomic time series data. Such studies include among others Pencavel and Holmlund (1988) for Sweden, Nymoen (1989) for Norway, Calmfors and Nymoen (1990) for Denmark, Norway and Sweden, Lehment (1991) and Franz and Smolny (1994) for Germany, and Dur (1997) for the Netherlands. All of these studies, with the exception of Lehment, find that longer working hours co-vary with lower hourly wages.²¹ A problem with these studies, however, is that the strong trends in both wages (upwards) and working time (downwards) over the estimation periods can make the results unreliable.

More emphasis should be placed on a few later studies that have used panel data, that is data with both time-series and cross-section variability. Hunt (1999)

²⁰ The theoretical literature includes contributions by, for example, Calmfors (1985, 1987), Hoel and Vale (1986), Holmlund (1987), Booth and Schiantarelli (1987), Booth and Ravallion (1993), Houpsis (1993), Marimon and Zilibotti (2000), and Nordström Skans (2002).

²¹ Note, however, that Nymoen (1989) and Calmfors and Nymoen (1990) found only short-run but no long-run effects.

estimated wage equations for individual employees in Germany, making use of the fact that both the timing and extent of working time reductions in the 1980s and early 1990s differed between sectors. Nordström Skans (2002) exploited instead the fact that working time was cut only for (some types of) shift workers in manufacturing and mining in Sweden in the 1980s, but not for other workers. Kapteyn, Kalwij, and Zaidi (2000) instead estimated wage equations for a panel of OECD countries. All three studies come up with very similar results, implying an elasticity of hourly wages with respect to working time of around -1 . This means that an increase in working time by one percent tends to lower hourly wages also by one percent. Put differently, the implication is that a working time increase – everything else equal – would leave total pay per worker more or less unchanged, as in the recent company-level agreements in Germany.

The empirical research described thus supports the view that working time increases contribute to substantial reductions in wage pressure. This gives a strong presumption that longer working hours do indeed have long-run positive effects on employment. At the same time, a caveat is in place. The estimated wage equations are all in a sense partial-equilibrium analyses, which raises the – theoretical – possibility that a full general-equilibrium analysis could give other results.²²

Some partial-equilibrium empirical results on the direct relationship between employment and working time also imply a presumption that longer working hours may help create more jobs when the effects on wage-setting behaviour are taken into account. When estimating reduced-form employment equations for a panel of industries in Germany, Hunt (1999) in many specifications found shorter working hours to reduce employment (for men) significantly. Kapteyn, Kalwij, and Zaidi (2000) found a negative, but insignificant, long-run effect on employment of working time reductions in their panel of OECD countries when wage effects were taken into account. According to Crépon and Kramarz (2002), using microeconomic data for individual employees in France, there was a higher unemployment incidence among workers who

²² For example, the empirical studies discussed do not take into account that the level of unemployment benefits is likely in the long run to adjust to the aggregate pay level of employed workers. This will happen, for example, if the replacement rate (the ratio of the unemployment benefit to the pay of an employed worker) is fixed and thus is not affected by a change in average working time. In this case, it is theoretically possible that an increase in working time in an individual firm only would reduce wages there, at the same time as an economy-wide increase in working time would reduce aggregate equilibrium employment. This can, for example, occur in the model of Nordström Skans (2002).

were affected by the 1982 reduction of the working week than among those who were not.

4. Conclusions

Both hours worked per capita and hours worked per employee are low in several continental European countries, such as Germany, France, Belgium and the Netherlands, as compared to the US. This accounts for a large part of the income difference between Western Europe and the US. The low working hours in Europe reflect to a large extent low standard working hours for full-time employees.

Recent company-level deals in Germany on longer working time may represent a reversal of the earlier trend towards shorter working time that could spread also to other Western European countries with low working hours. It seems that especially the French discussion has been very much affected by the working time developments in Germany, but also employer demands in Belgium and the Netherlands have been influenced.²³

The recent working-time agreements in Germany have implied longer working hours with no, or only partial, compensation and have thus reduced hourly wages. The deals can be seen as cost-cutting measures made necessary by both increased international competition in goods markets and credible employer threats to outsource jobs abroad associated with the on-going “globalisation” in general and EU enlargement in particular.

One way of thinking about the deals on longer working time is as a convenient way of reducing hourly wages without reducing the pay per employee. Indeed, this was an important argument in the German discussion that anticipated these deals. However, one can also view them as a labour supply response in collective agreements to a required reduction in the hourly wage, brought about by the forces of globalisation. The desired working time on the part of trade unions is likely to respond differently to a wage change than the desired working time on the part of employees when acting on their own. When the hourly wage falls, the ordinary substitution effect – which tends to reduce desired working time – is counteracted by a weakening of union incentives to restrict working

²³ Recently, for example, the French government has increased the ceiling for overtime from 180 to 220 hours per year. A new law also permits employers and employees to agree on overtime hours in excess of the legal ceiling.

hours in order to promote employment. This weakening occurs because the value for a union member of having a job is smaller if the wage is lower. Under some theoretical assumptions, the response of desired working time on the part of a union is governed by an *income effect* only. If so, it is in the interest of unions to increase working time if hourly wages have to fall.

When analysing the employment and output effects of longer working hours, it is essential to distinguish between the short run and the long run. Already in the short run, longer working hours at unchanged pay will by definition prevent job losses in firms where there is an acute risk of outsourcing production because costs are too high. Also in firms where this is not the case, such agreements will have positive employment effects, provided that longer working time of employees leads to a large enough increase in the utilisation of capital (because the capital stock can be operated for more hours). Indeed, such an increase in capital utilisation is one of the major advantages of longer working hours. However, in other firms where the operating time of capital cannot be increased and where it may take time to adopt new production methods, the employment effects are likely to be negative in the short run. Lower wages per hour will, however, always make it profitable for firms to expand output.

In the long run, the hourly real wage level in an open economy must be such that capital earns the same rate of return as abroad. It follows that the long-run *feasible* hourly wage depends on the world market rate of return to capital. A critical factor for the long-run employment effects of an economy-wide lengthening of working hours is therefore how wage-setting incentives are affected. If longer working time creates stronger incentives for wage moderation, lower unemployment is needed in equilibrium to discourage wages from rising above the feasible level. Although neither theoretical nor empirical research gives unambiguous conclusions, there is a presumption that longer working hours would contribute to wage moderation. If so, one should expect positive employment effects in the long run from longer working time. This would then add to the positive long-run output effects of an increase in working time that would arise already at an unchanged employment level.

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