

R

f R

D B

VIII European Conference



Labour Market Effects of Work-Sharing Arrangements in Europe

Francis Kramarz, Pierre Cahuc, Bruno
Crepón, Thorsten Skans, Gijsbert van
Lomwel and André Zylberberg

D

B

Labour Market Effects of Work-Sharing Arrangements in Europe

by

Francis Kramarz (Crest, École Polytechnique)

Pierre Cahuc (Crest, Paris I University)

Bruno Crépon (Crest, Ecole Polytechnique)

Thorsten Schank (Erlangen University)

Oskar Nordström Skans (Ifau, Uppsala University)

Gijsbert van Lomwel (Tilburg University)

André Zylberberg (CNRS and École Polytechnique)

Contents

Introduction

Chapter 1: Reduction of working time and employment

1. Introduction
2. Labor demand and working time
 - 2.1. The effects of reductions in working time when the hourly wage is constant
3. Working time, wages and employment
 - 3.1. Perfect competition
 - 3.2. Collective bargaining
 - 3.3. Monopsony power
4. Conclusion

Appendix

- A. Labor demand elasticities
- B. The collective bargaining model
 - B.1. The Nash criterion
 - B.2. The optimal number of hours worked
- C. The monopsony model with hours

Chapter 2: Working Time Developments in Germany

1. Introduction
2. Hours reductions in Germany
3. The impact of reductions in standard hours on employment and wages in Germany: Empirical Evidence
4. Making Working Time Flexible
5. Increases in Working Time: A new development?
6. Job Stability through Increases in Standard Hours?
7. Conclusions

Box 1: The IAB-Establishment Panel

Chapter 3: The Two French Work-Sharing Experiments: Employment and Productivity Effects

1. Introduction
2. Institutional Context
 - 2.1. Principles and Legal Aspects of the 1982 Reduction of the Workweek
 - 2.1.1. Changes in Hours
 - 2.1.2. The Mandatory Nominal Wage Rigidity and its Consequences
 - 2.2. Principles and Legal Aspects of the Nineties Reductions of the Workweek
3. The Effects of the 1982 Change
 - 3.1. Two Sources of Identification
 - 3.2. A Summary of the Results
4. Going to 35 Hours
 - 4.1. A First Description of Firms' Adoption of the 35 Hours Workweek
 - 4.2. A Productivity Decomposition
 - 4.3. Workweek Reduction Agreements and Economic Outcomes
 - 4.4. Workweek Reduction Agreements and Working Schedules
5. Conclusions

Chapter 4: Unions, Working hours and Absence: Sweden

1. Unions and working time reductions in Sweden
2. Subsidies of absence
3. Labor market effects of alternation leave schemes
 - 3.1. The alternation leave schemes

- 3.2. The absentees
- 3.3. The replacement workers
- 3.4. Welfare
4. Conclusions

Chapter 5: Work-sharing, part-time employment and childcare

1. Introduction
2. Work-sharing in the Netherlands
3. The impact of work-sharing on employment
4. Work-sharing and part-time employment
5. Childcare provision, public opinion and participation

Chapter 6: Conclusion

References

Introduction

Theory tells us that work-sharing is rarely good for employment. Or, at least, conditions under which work-sharing boosts employment are relatively demanding and are rarely met in practice. However, some countries implemented workweek reductions when others did not. One potential answer to this discrepancy is overly simplistic and populist. In those countries that decided to share work, politicians, union members or leaders, or even the public opinion were never confronted to the basic elements contained in Econ 101, the first course in economics taught at virtually all universities. They suffered from a miscomprehension of basic market mechanisms. Another answer goes as follows. For complex (historical, religious, and institutional more generally) reasons, countries came up with different agreements between the various social forces. These agreements are also the outcomes of collective bargaining, which takes very different routes in continental Europe. Finally, such agreements reflect basic preferences over various fields of each country citizens' common life (work and family in particular, or the respective importance and role of the private and the public spheres). The outcomes of the social processes at work should be reflected in the multiple ways of sharing work that have been adopted across Europe, as we will see.

To help understand the situation that exists now, we will first investigate the determinants of work-sharing building on theoretical work. Then, we will examine the employment effects of work-sharing using Germany and France as leading examples. Finally, we will try to understand some of the institutional and social factors affecting the choice of workweek reduction, using Sweden and the Netherlands as leading examples.

Chapter 1 examines the theoretical underpinnings of the effects of work-sharing on employment. Because institutions vary across Europe, different models are presented to capture this variation. These models shed light on institutional factors that may affect the decisions to decrease working hours. We describe these two points in turn.

First, models can identify deep factors that modify or are responsible for the employment effects of work-sharing. Let us summarize the main messages of the chapter on this first front.

The simplistic view that work-sharing, through a decrease in standard hours, creates employment is easily expressed in a simple framework in which firms' output is predetermined (i.e. Keynesian and short-term). In this view, the hourly wages do not adjust. And the effect of a reduction in standard hours depends on the natural choice of hours by firms. When this natural level is low vis-à-vis the new standard, work-sharing has no effect. At the opposite extreme, when this natural level is high vis-à-vis

the new standard, the reduction has the counter-intuitive effect of raising the number of hours worked by all employees and the associated effect of decreasing employment. Finally, when the natural level equals standard hours, hours drop indeed but the employment effect is ambiguous. Simple simulations show that the positive effect on employment for these firms appear to be of smaller magnitude than the negative effect on firms that need long hours. Notice though that the positive effect is exactly the one that proponents of work-sharing have in mind.

However, wages should adjust, mostly because fixed hourly wages examined just above entail decreasing monthly or weekly wages after a reduction. Hence, workers will ask for a wage compensation. Then, the analysis of a 10 percent decrease in standard hours shows that employment, profits, and production never increase, in fact always decrease, **unless** there is no wage compensation. In particular profits will decrease for most firms and, hence, hours reduction will eventually lead to firms destructions, the size of this effect depending on the size of the wage compensation. In addition, the chapter shows the size of subsidies that must be given to firms in order to maintain profits and employment.

Hence, in a simple framework, work-sharing potentially destroys jobs, firms if workers demand wage compensation to maintain monthly wages, and therefore forces the government to distribute payroll tax subsidies, a source of financing that might have a better use given the effect on jobs.

Then, because work-week reduction is likely to destroy jobs when markets are perfect, the chapter examines the effects of work-sharing when unions and firms bargain over wages **and** hours. Here, if the union's objective places a large weight on employment during collective bargaining, the outcome may entail more employment but, at the same time, the bargained solution implies **more** hours (not less) and lower weekly wages. Hence, to increase employment when collective bargaining takes place, hours must be increased and monthly wages decreased. Not exactly what appears to have been observed in the various experiments that we examine in this book.

However, the chapter also shows that when workers have a very strong preference for leisure, it may be possible to increase employment by decreasing weekly hours. Other favorable factors for employment in this bargaining framework are bargaining centralization and firms' market power; when the product market is less competitive, a decrease in standard is more likely to create jobs.

Second, models can help us understand the choice of hours, and therefore the forces against or in favor of work-sharing, as a function of institutions and as a function of the preferences of the collective or individual members of any given society.

This question is examined in Chapter 1 in two opposed, and complementary, situations: perfect competition and collective bargaining. Perfect competition allows us to understand the role of labor supply. Collective bargaining allows us to understand the role played by the unions as well as the role played by the economic environment in which firms operate.

In the case of perfect competition, a worker faces a wage schedule offered by firms that specifies earnings as a function of hours. He or she maximizes utility subject to this wage function. In particular, when workers prefer leisure, home production over work, they will tend to choose short hours. Furthermore, because interactions in the family matter, labor supply decisions, i.e. the amount of hours chosen by workers depend on hours chosen by other family members. Hence, in the so-called European model, workers may well have “collective” preferences for leisure through externalities: returns to leisure increase when more people take vacations.

In the case of collective bargaining, the Chapter shows very deep, and maybe surprising, results that tie various markets together. First, stronger unions tend to demand shorter hours. More interestingly, when negotiations are centralized, bargained hours should also be shorter. And, even more interesting, economies with less competition on the product market should also display shorter negotiated hours. However, the first effect – stronger unions demand shorter hours – is counterbalanced by another effect. When unions put a large weight on employment in their objective function, they should ask longer hours (and lower monthly wages).

Our theory chapter delivers very useful lessons on the two sides that are studied in our country chapters.

Chapter 2 examines the German case. Germany is a perfect illustration of the role of bargaining in determining hours of work. The metal and engineering workers’ union (IG Metall), with 2.5 million members in 2005 the second biggest union in Germany, has played a dominant role in post-war bargaining.¹ In the metal-working industry, normal working time was reduced to 40 hours in 1967. These cuts were intended to enhance the quality of life. Indeed, other industries followed these settlements several years later, and by 1975 the prevailing conditions for full-time workers were six weeks of annual holidays and just above 40 hours per week.

Given the rising unemployment in the seventies, in 1978-1979 IG Metall again launched a campaign to reduce standard working time below 40 hours in order to promote work-sharing. While their attempts failed in the face of employers’ strong resistance, they were more successful a few years

¹ IG Metall was by far the biggest union until 2001.

later, when, after a seven-week strike in 1984, normal working time was reduced to 38.5 hours in 1985. This was followed by further agreements between IG Metall and Gesamtmetall (the metal and engineering employers' association) on reductions of standard hours to 37 hours in 1988, to 36 hours in 1993 and to 35 hours in 1995. Other industries followed, even though standard hours varied (from 35 to 39 hours). The most prominent firm-level agreement on working time reductions has been the settlement between Volkswagen AG and IG Metall (down to 28.8 hours). It was mostly defensive, trying to preserve jobs.

Indeed, companies are often allowed to deviate from hours negotiated at the industry level. In addition, schedules are often quite flexible at this company level, in particular in those firms without a bargaining contract.

Many analysts have tried to evaluate the employment effect of these work-sharing agreements. Chapter 2 rapidly reviews their findings. None has found positive effects. One main reason, outlined in Chapter 1, is that full wage compensation was almost always negotiated in the agreements (Hunt, 1999 finds almost full wage compensation). And, as we have seen, there is little hope of creating employment when wages do not decrease. And, as pointed out in Chapter 1 when analyzing collective bargaining and hours determination, German unions appear to have been able to protect their members, certainly because employment had a low weight in their objectives.

However, as mentioned just above, firms and unions in the recent years negotiated agreements making hours more flexible. For instance, opening clauses allow workers to work longer hours than in the collective agreement. They also allow firms to implement working time corridors within which firms freely set their working time. Finally, firms may decrease working time with no wage compensation (for a limited period of time). On the worker side, employees are endowed with working-time accounts. These accounts measure the amount of extra time worked, which can later be exchanged against free time. In 2004, 42 percent of workers have such accounts. Notice that Chapter 2 provides the first analysis of these new developments, using firm-level data sources. In particular, this new flexibility has been used to increase working time in many firms (Siemens, or Daimler-Chrysler are two prominent examples).

The effects of such increases are analyzed using the IAB data source. Roughly 2.5% of plants have increased working time over the last 12 months (over 2004, approximately). In most such firms, monthly wages stayed put (hourly wage decreased). Results show that firms that increase standard hours also have decreasing employment when firms that decrease standard hours have stable employment. In particular, when standard hours increase, firms use less part-time workers as theory predicts (full time workers become less costly). However, and more encouraging, in Western Germany

increasing standard hours is associated with increased productivity, measured by value added per worker, the coefficients being large but only marginally significant, when decreasing standard hours is associated with essentially unchanged productivity. In Eastern Germany, decreasing standard hours generate the expected result; productivity decreases.

Chapter 3 examines the French case. Many complementary lessons can be derived from the two workweek reductions that took place in France.

The first episode of hours reduction took place in 1982. Less than one year after François Mitterand was elected president, the workweek went from 40 hours to 39. The stated objective was reducing employment. The policy was part of the program of the left-wing parties, the so-called “programme commun”, and was implemented without negotiation with business unions or workers unions.

The employment effects of this policy were evaluated in Crépon and Kramarz (2002). They confirm the main message of Chapter 1. Because monthly pay was not allowed to decrease, hence hourly wages increased, firms reacted following the textbook: employment decreased. More troubling, workers primarily affected were those paid around the minimum wage (the SMIC) who “benefited” the year before of large hikes.

Potentially informed by the previous episode, the Jospin government, with Martine Aubry as Minister of Labor, decided to fulfill another electoral promise and to go to 35 hours. Discussions between the government, which included the green party, and business unions were tense. Negotiations started within various industries and firms. But, at some point, Martine Aubry enacted a law essentially forcing firms above 20 employees to come up with some agreement with their workers’ unions or delegates. In addition, various incentives and subsidies were proposed at different moments in time.

In June 1998, the so-called Aubry I laws gave establishments incentives to reduce their workweek and create or preserve employment in exchange for large subsidies. In order to receive these subsidies, firms had to reduce hours by at least 10% in order to attain an average weekly duration of 35 hours. In such a case, employment creation had to amount to 6% of total employment. A “defensive” aspect also allowed firms to receive subsidies to avoid economic separations or collective dismissals.

The 2000 law, Aubry II, offered payroll tax subsidies for all firms that decided to go to 35 hours per week.

Hence, among firms with more than 20 employees, at the beginning of the 21st century, various agreements prevailed. Some firms were still at 39 hours and had to pay overtime, others went to 35 hours between June 1998 and January 2000 and received incentives and subsidies, others refused the incentives (but received some “structural” subsidies) even though they went to 35 at similar dates (the

so-called Aubry II forerunners). Firms also went to 35 hours after January 2000, receiving only the “structural” subsidies. Finally, remaining firms went to 35 hours and decided to receive no subsidies. Wage compensation schemes and wage moderation agreements were implemented at the same time so that monthly wages stayed constant in the short-term and did not increase too rapidly in the longer-run. Labor costs for low-wage workers did increase too strongly thanks to the payroll tax exemptions that were expanded in those years.

Until 2005, when all minimum wages were unified, there existed a flurry of SMICs depending on the moment the firm reduced the workweek.

Contrasting the French experience with the German one shows that the French government intervened massively and did not let the so-called “social partners” come up with an (unlikely, to be honest) agreement.

How can Chapter 1 enlighten these outcomes. If there was bargaining, it was at the central level; something that should favor workweek reduction, as explained in the theoretical chapter. But, because the financial situations of firms in those years was extraordinarily diverse, firms strongly resisted these changes that clearly meant decreased profits for a large fraction of them. Hence, this forced the government to distribute massive subsidies (see again Chapter 1) and suggest wage moderation. One may wonder why unions accepted, and sometimes pushed, for work-sharing. First, not all industries were highly competitive, a factor favoring hours reductions. In those relatively protected industries, unions’ bargaining power was quite high (see Abowd, Kramarz, Lengermann, and Roux, 2005), another factor favoring unions’ push for shorter hours. Potentially, the French preference for leisure was also high in comparison with other countries (even though, we do not have any indisputable estimate of this “deep” preference parameter).

On the employment side, because the 35-hours policy was accompanied by massive subsidies, both theoretical and empirical predictions are difficult. And because implementation was gradual, any serious evaluation is fraught with difficulties, in particular those related to the various selection biases due to firms’ self-selection into the program. Chapter 3, however, provides the most up-to-date evaluation of the 35 hours policy, not only on employment but also on other firm-level outcomes.

The main message may be that the 35 hours policy was a massive shock, with lots of unintended and not-well understood consequences. Many firms that decided to stay at 39 hours died in the years following the policy. Was it purely due to the increased costs ? This is difficult to say at this point. But the question remains. Many firms that went 35 also died after 2000. What was the role of this policy ? Once again, it is difficult to be definitive. Some firms gained employment, in particular those that

adopted the Aubry I framework. The estimates provided in the Chapter show that a fraction was due to work-sharing, another was due to decreased labor costs, but structural incentives and other types of help surely played a role which is difficult to assess. In addition, the death of competitors might have also played a part. Clearly though, these firms decreased their labor productivity as well as their total factor productivity, which is rarely a good sign in those years of intense international competition.

Another outcome that must be taken into account is the impact of the policy on workers' happiness. Very little information is available at this point. In the chapter, results on changes in work schedules are presented and show that they are now more irregular and more difficult, in particular for low-wage or mid-wage workers. Apparently, engineers, managers and professionals were affected but might have benefited from the increased vacations that went with the 35-hours policy.

At this point, caution is granted when evaluating the recent wave of French work-sharing. Serious analysis is difficult but the effects on the economy have been pervasive, potentially destructive, with large and unintended consequences mostly through an important reallocation of jobs across firms.

Chapter 4 and Chapter 5 present two cases that completely differ from those examined in the two previous chapters. In those two countries, Sweden and the Netherlands, respectively, are "small" countries in which there is a longstanding negotiation tradition. Let us start with Sweden.

The Swedish case suggest that strong unions and a labor movement with close ties to the political power does not necessarily lead to large reductions in working hours, as were observed in France. Even "worse", there was virtually no debate on work-sharing in Sweden. Work-sharing historically never was a prominent feature of the Swedish debate, nor a motivation for the reductions that were implemented over the years. It is also striking how little happened to working hours in Sweden in recent decades. And, the small changes that took place were always very flexible in their implementation. Instead the Swedes chose to give substantial subsidies to promote career interruptions. These interruptions matter. Indeed, even though legislated and contractual working hours are relatively long, such career interruptions make actual hours equal to the European average.

Since working time reductions and leave subsidies both reduce the number of actual hours worked, they are likely to be competing policies. The theory chapter should help us understand this choice. Given the strong labor movement in Sweden, and its high degree of centralization, Chapter 1 tells us that unions should favor short hours. But, because Sweden is a small open country, with many industries competing on the world market, chapter 1 also tells us that unions should favor longer hours (see the collective bargaining model and its lessons).

Although Swedish bargaining institutions changed substantially with the breakdown of central agreements in the early 1980s, the Swedish model was set up in order to let the industries facing intense international competition govern wage rate increases with the explicit desire to preserve Sweden's international competitiveness. The expressed goal was to increase overall productivity, even at the cost of shutting down low-productivity firms. For the labor movement, high productivity and high international competitiveness was always viewed as instrumental for building and keeping the Swedish welfare state.

A compromise had therefore to be found. Unions wanted shorter hours but not at the expense of productivity. Work-sharing, in its simplest form, was not an option. The career break policies on the other hand, were set up as part of the welfare state. When set up in the 1970s they were aimed at facilitating female labor force participation, and making it easier to combine work and family life. In particular, career breaks tried to facilitate sickness absence, child care, or education. They indeed expanded alongside a growing female participation rate.

Chapter 4 shows that they essentially have little impact on those who leave as well as on those who benefit from these career breaks. For the former, breaks represent essentially leisure and not an education opportunity. And the replacements appear to be unemployed workers with a relatively strong labor force attachment and reasonable re-employment opportunities. To summarize the chapter conclusions, this policy had negative effects on participants subsequent wages and are not likely to have contributed to the employability of the long-term unemployed, in contrast to the initial intention.

In the Netherlands, another strategy was followed. It is described in Chapter 5. As mentioned above, standard hours fall within the realm of collective bargaining between workers and business unions. Hours for full time workers fell, as in many countries over the seventies and the eighties but remained roughly constant from the nineties on. The Wassenaar agreement in 1982 constitutes the key moment of Dutch labor relations. In those years of recession, firms were looking for more flexibility when workers unions, to preserve employment, agreed to wage moderation (no automatic adjustment of wages to inflation) in exchange for some work-sharing. Work-sharing was defined loosely but clearly included a shorter workweek, increased holidays, early retirement, and part-time work. And between 1982 and 1985, hours were reduced by increasing holidays. But then, the push for shorter hours appears to have stopped until the mid-nineties when unions and firms agreed on a 36 hours week with full flexibility of their use and reduced overtime premium.

As in all other countries examined, the impact of work-sharing on employment appears to have been essentially zero. All evaluations concur on this outcome, as described in the Chapter. One reason is wage compensation that took place: a decrease of one percent in working time being associated with

an increase of 0.5 percent in hourly wages. This outcome did not escape the attention of unions, apparently. Hence, work-sharing was mostly implemented through part-time.

The turn to part-time work was massive. For instance, between 1980 and 1984 the number of part-time jobs soared from 132,000 to 829,000. Unions at first opposed part-time. But, new female membership was also seen positively, most particularly in industries with a large fraction of women. And, in 2000, a law enacted the right to work part-time for all (except for “compelling business reasons”). Now, the Netherlands are the first part-time economy of the world.

Women started relatively late to participate in the labor market, at least as compared to other European countries. Factors explaining this late start are described in the chapter. The labor supply considerations that are involved are the main causes for the Dutch specificities. Once again, our theory chapter shows how supply can also play a role in the appeal and the shape of work-sharing.

A central fact of Dutch life and values revolves around married women. For instance, the chapter reports that in the seventies more than 60% of the Dutch found that it was troublesome for women to work outside the house (with children at daycare) late until the beginning of the eighties when this proportion dropped to a relatively high level of 35% in 1997. The optimal number of children is 4 or more for 12% of Dutch when only 6% of the German, French, Swedes or Danes report this number. In their attitude to sharing of roles in the family, the Dutch resemble the Germans more than the Swedes or even the French. In addition, roughly 50% of women with young children stopped working after giving birth. Informal child care arrangements appear to be favored by the Dutch (66% use the grandparents, family, friends, baby-sitter when 13% use day-care centers). This stands in stark contrast with countries like France, for instance, where formal day-care have long been favored by the government. And, now for my favorite statistics: 70% of Dutch couples disagree with the idea that both men and women should contribute to household income. The equivalent proportions in West Germany, France, Sweden, and Denmark are respectively 31%, 19%, 12%, and 27%. Preferences are clearly expressed. Clearly they matter to understand work-sharing arrangements in the Netherlands.

Finally, a brief conclusion helps drawing policy-oriented lessons from these four countries experience.

Chapter 1: Reduction of working time and employment

1 Introduction

Worksharing implemented by reductions of working hours per week, per month or per year has often emerged as a potential instrument for reducing unemployment. Over the last twenty years, it has been more than a simple potentiality. In Germany, reductions in standard hours have been negotiated between unions and employers in the eighties and the nineties to induce worksharing. In France, large-scale compulsory reductions in standard hours have been implemented with the explicit goal of expanding employment. The basic theory that motivates worksharing policies relies on a simple rule of three. For a constant level of production, reductions of working time increase the number of necessary employees. This simple reasoning can make sense in a keynesian world in which firms production is determined by aggregate demand. However, it is now well established that the keynesian conception of economics neglects many determinants of employment, especially in the long run. In the long run, labor costs and productivity are the main determinants of employment. Therefore, reductions in working time can generate employment growth only if they entail changes in productivity and labor costs that favor employment. Obviously, labor costs and productivity are themselves influenced by a large number of institutional features which interact with standard hours and must be taken into account to understand the consequences of compulsory reductions in working hours.

Indeed, economic analysis shows that compulsory reductions in standard hours can increase employment only in very special circumstances that are very rarely met in the real world. In particular, it is generally not possible to increase employment by reducing working hours if there is full wage compensation. In other words, reductions in weekly working hours have to go hand in hand with cuts in weekly earnings to favor employment growth. The magnitude of the required reduction in weekly earnings depends on the productivity changes induced by working time reductions. If reductions in working time induce productivity increases of hours worked, it is possible to increase the number of jobs with small reductions in weekly earnings. However, if hours productivity remains constant, large cuts in weekly wages are required. We will see that the empirical chapter devoted to France and Germany, two countries which implemented reductions in standard hours in order to increase employment confirm these theoretical results.

Moreover, these results indicate clearly that the impact of compulsory reductions in working hours on employment hinges on the reaction of wages. Wages themselves are determined by preferences,

technology and markets mechanisms. The analysis of these mechanisms in different contexts, including perfect competition, collective bargaining and monopsony, will allow us to shed light on the choices over working hours and the consequences of reductions in working time when wages are endogenously determined. We will see that the determination of working hours depend on features such as the preference for leisure, non market production, the wage bargaining structure, firms' market power, and regulations of working conditions. This analysis sheds some light on the changes in working time in the countries (France, Germany, the Netherlands, Sweden) which are presented in the other chapters of this part of the book. For instance, it allows us to understand the spread of part time in the Netherlands, the reasons why reductions in standard hours in Germany were not accompanied by drops in weekly wages and employment increases, or why strong trade unions in Sweden did not bargain reductions in working time.

This analysis also enables us to better understand the role of the state in the regulation of working time. Indeed, it shows that when competition is imperfect, choices over working hours are not efficient. Therefore, working time regulations are needed. Nevertheless, even in this favorable case, compulsory reductions in working hours cannot systematically improve employment and welfare.

The chapter is organized as follows: section 2 is devoted to the analysis of labor demand when the firm chooses the number of jobs and hours. The interactions between employers' choice and workers' choice over hours, employment, and wages are studied in section 3. Section 4 provides some concluding comments.

2 Labor demand and working time

In order to grasp the determinants of the tradeoff between jobs and hours, it is necessary to distinguish the contributions of these two elements to the production process, and to differentiate between the costs arising from an increase in the number of employees and those that arise from a change in the number of hours worked by each employee. Assuming that the hourly wage remains constant, one can then study the "pure" effects of working time reductions. But reductions in working time with constant hourly wages means cuts in weekly and monthly wages. Workers are probably not ready to accept such cuts and will probably ask for higher hourly wages in order to keep their purchasing power constant. This affects the outcome of compulsory working time reductions.

2.1 The effects of reductions in working time when the hourly wage is constant

The production process

Firms produce output with capital and labor services. Both labor and capital services are influenced by the duration of work. The working time of each worker determines the number of units of labor services that he provides. A priori, an increase in working time raises the number of units of labor services that each employee produces. However, it is important to stress that this relation

might be quite complex, for set up costs might imply that a minimum number of hours is required to get positive returns from labor services, then, above this number, labor services efficiency should increase rapidly with the number of hours. The effects of fatigue should, at some point, cause marginal efficiency to decrease when working time is long.

Likewise, the duration of capital utilization may depend on working time. One should expect the duration of capital utilization to increase with the duration of work. However, it can be the case that the duration of capital utilization is independent of the individual duration of work, or even decreases with the duration of work if there are reorganizations of the production process associated with changes in working time.

These brief remarks merely indicate that a firm that keeps its number of employees constant lowers its level of production when working hours and the duration of capital utilization are reduced.

The cost of labor

The cost of labor does not depend in a simple way on its duration because workers and hours are distinct inputs. This distinction is important for at least two reasons (Rosen, 1968, Hart, 1987).

First, for each employed person, it comprises fixed costs that do not depend on the duration of work, principally the costs of hiring and firing, training costs, and certain social security contributions. These fixed costs are influenced by the institutional environment: for instance, they are higher in countries in which job protection is more stringent. They also depend on the unemployment rate: when the unemployment rate is higher, hiring costs should be lower if it takes less time to find unemployed workers.

Second, in many countries there exists a legal or standard work duration, and every overtime hour worked above the standard is compensated at a higher rate. For example, in the United States the 'Fair Labor Standards Act', signed in 1938, defines the standard work week as 40 hours and specifies an overtime rate that is 50% higher for any hour worked above this limit. In this context, the labor cost writes can be written as:

$$C = \begin{cases} [WT + (1 + x)W(H - T) + Z] N & \text{if } H > T \\ (WH + Z) N & \text{if } H \leq T \end{cases} \quad (1)$$

where

T denotes the standard work week

W denotes the wage for standard hours

Z denotes the fixed costs

x denotes the overtime premium

The choice of capital, hours and jobs

For each firm, its optimal choice of capital, jobs and hours is deduced from the minimization of this total cost, made of labor costs C plus capital costs. The expression (1) of the labor costs C indicates that labor demand, here the number of persons employed *and* hours worked, should depend on the comparison between the value of the variable labor costs — determined by W , T and x — and that of the fixed costs of labor represented by Z . Intuition suggests that a reduction in fixed labor costs gives firms an incentive to substitute workers for hours, and thus ought to favor employment. Conversely, a reduction in variable costs ought to increase the number of hours worked, to the detriment of employment. The demand for workers and the demand for hours may thus vary in opposite directions.

The influence of standard hours on hours and jobs

Changes in standard hours have differential effects depending on whether or not the firm uses overtime. Imagine that the level of standard hours is high relatively to what the firm needs. Then the optimal number of hours is lower than standard hours and obviously, changes in standard hours have no effect, neither on employment nor on hours actually worked. However, things differ in all other cases.

If the optimal number of hours just corresponds to standard hours, the effects of a change in standard hours on work duration are trivial: a reduction in standard hours evidently leads to a drop in the number of hours actually worked. But the consequence on the number of jobs is a priori ambiguous. On one hand, the expression (1) of total labor costs shows that a reduction in standard hours amounts to a reduction in the cost of each worker (equal to $WT + Z$), an effect that tends to increase employment, but on the other hand, it also means that the efficiency of labor is decreased, which may give the firm an incentive to lower its employment level.

Imagine now that the level of standard hours is low relatively to what the firm needs. Then the optimal number of hours is higher than standard hours and firms will make use of overtime hours. Looking at the definition of labor costs (1), decreases in standard hours increase the marginal cost of each job (equal to C/N) but do not change the marginal cost of overtime hours (equal to $(1+x)W$). Therefore, the ratio between the cost of an additional worker and the cost of an additional hour increases, which incites firms to increase work duration at the expense of the number of jobs when standard hours drop (see Rosen, 1968, and Calmfors and Hoel, 1988). In this case, reductions in standard hours have the counter-intuitive effect of *raising* the number of hours worked by all employees. In other words, reductions in standard hours increase working hours by causing the number of overtime hours to rise. This effect is at odds with the stated purpose of working time reductions: bringing down the actual number of hours worked by each individual so as to increase the number of jobs.

Economic theory shows that the employment effects of standard hours reductions are a priori ambiguous: when the hourly wage is taken as given, reductions in standard hours should decrease

H^*	η_x^H	η_T^H	η_x^N	η_T^N
$0.9 \times T$	0	0	0	0
T	0	1	0	-0.96
$1.04 \times T$	-2.23	-2	2.00	1.86

Table 1: Values of elasticities of hours and employment. The table reads as follows: last row, last column indicates that a one percent increase in standard hours in firms in which the duration of work amount to 104 percent of standard hours entails a 1.86 percent increase in employment. Source: Cahuc and Zylberberg (2004, table 4.2, p. 203).

employment in firms in which actual working hours are larger than standard hours and have the opposite effect when actual hours are equal to standard hours.

Some quantitative results

In order to shed light on the potential impact of standard hours reductions on employment, we consider a simple case in which the production function is Cobb Douglas, where the share of labor costs in total costs is 0.7 and where the elasticity of substitution between capital and labor is equal to one. Empirical studies suggest that such values are relevant for an “aggregate” production function that represents the technology of the whole economy. We assume further that the elasticity of labor efficiency with respect to hours worked is equal to 0.9.¹

We distinguish three types of firm according to the relative level of their fixed costs compared to their variable costs in order to have three different behaviors for the choice of optimal hours. In our calibration, firms with small relative fixed costs have a level of optimal hours equal to 90% of standard hours ($H^* = 0.9 \times T$), firms with medium relative fixed costs have a level of optimal hours just equal to standard hours ($H^* = T$), and firms with high relative fixed costs have optimal hours equal to 104 percent of standard hours ($H^* = 1.04 \times T$). Assuming that the overtime premium x is equal to 30%, table 1 gives the values for the elasticities of optimal hours and employment, with respect to overtime premium (η_x^H and η_x^N) and legal duration of work (η_T^H and η_T^N).

Table 1 shows that variations in standard hours have very different effects on employment, since elasticity η_T^N runs from -0.96 to 1.86 when the only source of heterogeneity in firms is the extent of the relative fixed costs of labor. The same remark applies to overtime premium. A reduction in the number of hours worked allows employment to be significantly increased (at a given hourly wage) when the actual number of hours is the same as the standard one, but has a very strong negative effects on employment in firms that make use of overtime. In that case, decreases in standard hours imply increases in the number of hours worked and decreases in employment. The order of magnitude are quite large, as it turns out that a 10 percent reduction in standard hours entails a 20 percent increase in working hours (table 1, las row, column three indicates that the elasticity η_T^H amounts to -2) and a 18,6 percent decrease in employment.

¹Formally, the production function takes the form $AK^{0.3}[H^{0.9}L]^{0.7}$ where A is a positive constant.

Changes in: (percentage)	Case 1	Case 2	Case 3
Employment	+13	-17	-5
Production	+6	-22	-16
Profits	+12	-33	-8

Table 2: The effects of a 10 percent decrease in standard hours. Case 1: No wage compensation, 5 percent decrease in weekly labor productivity and no decrease in the duration of capital utilization. Case 2: Full wage compensation, 10 percent decrease in weekly productivity and 10 percent decrease in the duration of capital utilization. Case 3: Full wage compensation, 6.66 percent decrease in weekly labor productivity and no decrease in the duration of capital utilization.

2.2 Compensating for the global wage reduction

Until now, we have looked at the impact in changes in standard hours or in the overtime premium, taking the hourly wage as given. Now there are good reasons to think that the hourly wage is affected by changes in these two variables; reductions in time worked entail reduction in monthly earnings when hourly wages are constant. Wage-earners should resist such income cuts and, therefore, demand higher hourly wages. The German and French past experiments show that it is indeed the case (see Hunt, 1999 for Germany, see the French chapter in this book that describes the two working time reductions of the eighties and the end of the nineties). According to any labor demand model, a rise in the cost of labor will end up in lower employment. This is not the end of the story, however, since a standard hours reduction can also have (at least) two beneficial effects on employment which may counteract the labor costs increases.

A first beneficial effect, already mentioned, is that average labor productivity is larger when the duration of work is shorter (the effects of fatigue decrease marginal efficiency for large values of hours). In other words, labor is more intensive when it is spread on shorter durations and, as a general rule, increases in average labor productivity favors employment. A second beneficial effect comes from the potential reorganization of the production process. Reductions in standard hours followed by reductions in the duration of capital utilization will have an adverse impact of firms profitability and therefore on employment. However, reductions in standard hours may induce significant reorganization in the production process leading to more intensive capital utilization and thus to higher employment.

The final impact of a reduction in standard hours will depend upon the magnitude of these different effects. We use a model of labor demand similar to the preceding one to evaluate the impact of a 10% reduction in standard hours under three different situations ². Table 2 displays the results of these three cases.

The most favorable case for employment is scenario 1. It assumes no wage compensation (the weekly wage decreases by 10 percent), the production process is reorganized in order to keep the same

²For more details see the appendix on the labor demand elasticities.

Employers subsidies necessary to keep unchanged	Case 1	Case 2	Case 3
Employment	-8	10	3
Profits	-5	14	7

Table 3: Minimum level of employment subsidies (in percentage of initial labor cost) necessary to maintain employment and profits when standard hours are decreased by 10 percent

duration of capital utilization; the average productivity of an hour of work increases by 5 percent implying that the productivity of labor over the week is decreased by 5 percent. Under this scenario a 10 percent reduction in standard hours leads to increase in employment of 13 percent (firms profits are increased by 6 percent and output by 6 percent). Case 2 is the worst for employment. It assumes a decrease in capital utilization, full wage compensation (the weekly wage does not change) and no gain in hourly productivity. It entails a 17 percent decrease in employment with even greater drops in production and profits. Cases 1 and 2 represent two polar cases and any intermediary case should be attainable by varying the amount of wage compensation, the gain in hourly productivity, and the change in capital utilization. Case 3 represents such an intermediary situation where the wage compensation is complete, hourly labor productivity increases by 3.33 percent³ and capital utilization remains unchanged. In this last case, employment decreases by 5 percent, whereas total output and firms profits also decrease significantly.

These results highlight the importance of wage compensation. Reductions in standard hours with full wage compensation appear to be detrimental to employment even if the productivity gains are huge⁴. Moreover, reductions in working time can have strong negative effects on profits, especially for firms in which productivity gains are small but where wage compensation is large. Working time reductions may well accelerate the destruction rate of some firms as suggested by Chapter 3 which shows that reductions in working time implemented in France have increased the death of many firms in the beginning of the years 2000s.

These results suggest that policies that reduce standard hours, without inflicting large damages on weekly or monthly wages as well as on profits, should be linked with subsidies accruing to firms. This strategy was implemented in France, where the reduction in working time to 35 hours was accompanied by important payroll tax subsidies, in order to favor job creation (see the Chapter on the French experience). Table 3 displays the level of subsidies (expressed as a percentage of ex ante labor costs) that are necessary to maintain employment and firms profits under the three cases considered in Table 2.

Except in the (unreasonable) scenario described in case 1 where the weekly wage is reduced by

³Estimates of the relation between hours and labor productivity yield very heterogenous results. Using French data Gianella and Lagarde (1999) do not find any productivity gain following a reduction in working time. However, Crépon *et al.* (2004) find large productivity gains associated with the “Aubry” reductions in working time in 2000 in France. It should be noticed that the “Aubry” reductions have been accompanied by important changes in the regulation of working conditions, which allow the employer to use more flexible hours.

⁴See the discussion in the appendix on the labor demand elasticities.

10 percent, Table 3 tells us that reductions in standard hours with full wage compensation must actually be subsidized if one wishes simply to maintain the employment level and profitability. Even in the favorable case 3 where labor productivity increases dramatically, firms faced with a 10 percent reduction in standard hours need subsidies that amount to 3 percent of total labor costs in order to keep the level of employment unchanged (the subsidy must reach 7 percent of total labor costs to keep the profits unchanged). Two significant lessons emerge from these results.

First, reductions in weekly working time cannot increase employment if weekly labor costs remain constant. For workers paid at the minimum wage, this means that governments cannot increase employment thanks to reductions in working time that are not accompanied by cuts in labor costs. Labor costs can be reduced thanks to lower weekly earnings of employees. But such a scenario is generally not desirable. It is also possible to accompany reductions in working hours by job or payroll tax subsidies. From this point of view, table 3 illustrate one of the main conclusion of Chapter 3 devoted to the French work-sharing experiments: work-sharing policies by themselves do not allow employment to be shared as long as the profitability conditions of firms are not preserved; however, work-sharing associated with large wage subsidies can increase employment. However, it turns out that such subsidies induce more job creation *without* reducing working hours, as long as the weekly earnings of employees remain the same.

Second, as the employment effects of compulsory reductions in working time are conditioned to a large extent by the reaction of wages, it is essential to know more about the impact of such reductions on wages to be able to understand the resulting employment effects.

3 Working time, wages and employment

The competitive model of the labor market is a useful point of departure to begin to analyze the consequences of reductions in working time on wages and employment. We are going to see that this model delivers a very deceptive conclusion: it shows that compulsory reductions in standard hours cannot improve welfare and are likely to destroy jobs. However, real economies are not perfectly competitive. From this point of view, it is worth looking at models of imperfect competition to fully understand the consequences of reductions in working time on employment when the reactions of wages are taken into account. The conclusions obtained when imperfect competition is accounted for help us to understand the usefulness of regulations of working hours. Moreover, they show that small compulsory reductions in hours can, in certain circumstances, increase employment.

3.1 Perfect competition

In a perfectly competitive economy, compulsory reductions in standard hours cannot improve welfare because they introduce constraints in a context in which the allocation of resources is efficient. Generally, the inefficiency of compulsory reductions in hours implies that such reductions are bad

for employment. However, interactions of labor supply decisions within the household may increase aggregate employment when (inefficient) compulsory reductions in working hours are introduced.

The choice of hours and wages

Economic analysis shows that perfect competition on the labor market should lead to wage heterogeneity purely resulting from differences in working conditions (some jobs are harder than others) and from differences in abilities among suppliers of labor. Differences arising from working conditions are explained by the hedonic theory of wages, the premises of which were sketched by Adam Smith at the end of the eighteenth century, and was more recently formalized by Rosen (1974, 1986). From the perspective of the hedonic theory, wage heterogeneity reflects compensating differentials: employees who work more hours per week should get higher earnings because they work more. But the hedonic theory of wages yields more precise predictions: it shows that weekly earnings and weekly working hours hinge on preferences and technology. Such results can be illustrated in a simple framework where preferences are represented by a utility function $v(\Omega, H_0 - H)$, where Ω denotes weekly earnings, H_0 the time allocation and H the working hours per week. Between-firm competition implies zero profits and wages equal to marginal productivity. This process leads to define the weekly earnings as a function of weekly hours, denoted by $\Omega(H)$. The slope of this function depends on the technology. It should be increasing when working hours are sufficiently small, but may become decreasing when hours are very long (fatigue may reduce labor productivity beyond a threshold). The function that each worker faces may also be discontinuous, because her activities may need to be coordinated with those of other workers. In this context, each worker chooses the working hours that maximize her utility subject to the weekly earnings function $\Omega(H)$. The solution is displayed on figure 1. It turns out that workers choose working hours such that the marginal rate of substitution between earnings and hours equals the marginal returns $\Omega'(H)$ of working hours.

This solution highlights that the choice of hours hinges on both preferences and technology. In particular, individuals may choose lower working hours if they have stronger preferences for home production. As stressed by Becker (1965), individuals may prefer to eat a meal prepared by themselves rather than working to be able to go to the restaurant. Therefore, working hours should be lower in economies where home production is more widespread. Indeed, Freeman and Shettkat (2005) have shown that working hours are shorter in Europe than in the U.S., but individuals, and especially women, devote more hours to home production in Europe than in the U.S.. It is however not clear whether this phenomenon arises from differences in preferences, rooted in different cultures or from differences in taxes (Blanchard, 2004, Algan and Cahuc, 2006, Pissarides et al., 2004, Rogerson, 2003). The competitive model can also explain how technological changes can induce changes in working hours (Greenwood et al., 2005). In the same spirit, Chapter 5 below suggests that the spread of part-time employment in the early 1980s in the Netherlands has a lot to do with women catching up on

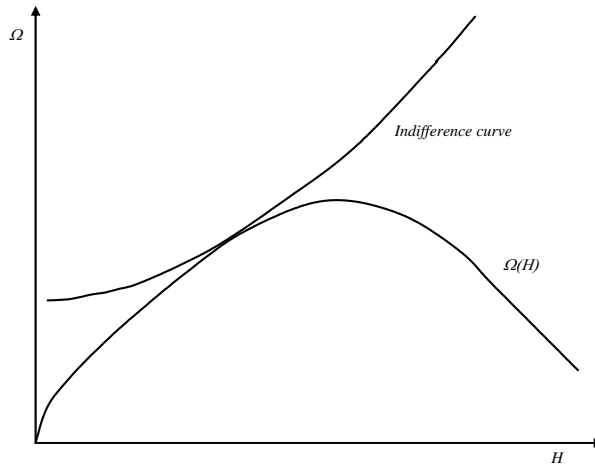


Figure 1: Hours and wage in the economy with perfect competition

their labor force participation in a country in which traditional family values urge women to grow up their children by themselves, with a little use of public childcare. Accordingly, in the Netherlands, the spread of part time has nothing to do with worksharing, it is a way to integrate women into the labor market in a context in which it is considered that the provision of childcare remains a responsibility of the individual household.

Reductions in working time

What are the consequences of compulsory reductions in working time when hours and wages are determined by a competitive mechanism? Is it possible to foster job creation in European countries by accelerating the decline in working hours observed in those countries as suggested by some observers?

Unfortunately, as we have seen, the perfect competition model suggests, at first sight, that reductions in working hours cannot increase employment. At best, such reductions have no effect on employment because the adjustment of the hourly wage rate can crowd out the impact of reductions in standard hours on labor costs. More precisely, as suggested by Hamermesh and Trejo (2000), reductions in standard hours can lead to decrease hourly wage rates because the number of hours worked that benefit from overtime premium is increased when standard hours are decreased. Accordingly, when standard hours drop, there are more overtime hours, but each hour of work is paid a lower wage such that both weekly wages and hours of work remain unchanged.

However, reductions in the upper limit of hours worked can change employment because they change the scope of contracts that can be bargained over. In order to grasp the employment effects of such changes, it is necessary to explain how employment is determined in our competitive model. Employment is determined by the labor market participation decisions of individuals. More precisely, an idle person whose non market income is equal to R reaches a utility level given by $v(R, H_0)$. Thus,

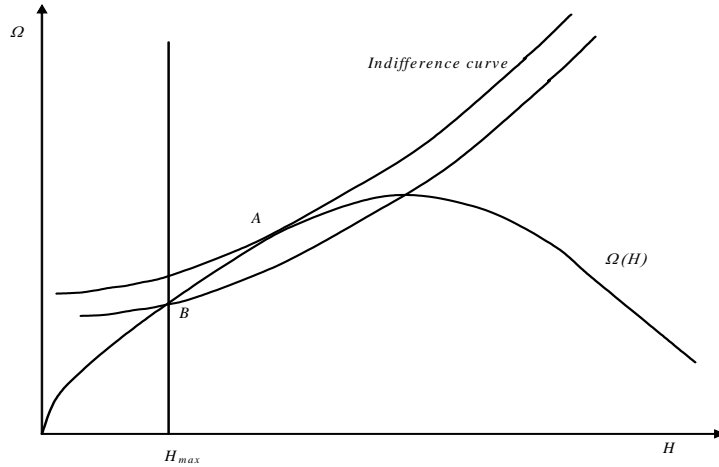


Figure 2: Reducing working hours with perfect competition.

only the individuals for whom $v(R, H_0) < v(\Omega, H_0 - H)$ accept jobs with earnings Ω and working hours H . In this context, as shown by Figure 2, the scope of contracts being smaller when the upper limit of hours worked is reduced, this leads to a decrease in the maximum utility derived from waged work which diminishes labor market participation. It can be seen on Figure 2 that the equilibrium goes from point A to B where the number of hours is lower and where the individuals achieve an indifference curve that corresponds to a lower level of utility. Therefore, in this context, reductions in working time cannot improve employment and efficiency.

Labor supply interactions within the family

For many individuals, labor supply decisions are influenced by other people through family interactions. From this point of view, economic analysis shows that constraints on the labor supply on certain members of a household can induce the other members to increase their own labor supply (Chiappori, 1992, Blundel and MaCurdy, 1999). This is the well known added-worker effect: if someone loses her job and becomes unemployed, other family members, initially inactive, may be induced to look for a job. The effects of constraints on working hours can be similar: if reductions in working hours lead to decreasing earnings for those individuals who work less, other individuals may be induced to enter the labor market to maintain the household income. Such a process can generate employment. In particular, female employment may increase because women may raise their labor supply when their husband's working time is reduced compulsorily. Nevertheless, as such reductions in working time add restrictions on the set of choices of the household members, they can never be welfare improving. Therefore, they cannot be recommended even if they may lead to female employment expansion.

The contribution of Gersbach and Haller (2005) sheds a somewhat different light on this issue. They consider a context where household members differ in individual preferences and enjoy positive

leisure-dependent externalities. The presence of a “workaholic” member exerts negative externalities which can be limited by compulsory reductions in working hours. Therefore, restrictions on the number of hours an individual is allowed to work can benefit all workers and favor employment. Gersbach and Haller simply show that the introduction of externalities allows us to depart from the conclusions of the competitive case. In the same spirit, Alesina et al. (2005) argue that European labor market regulations, advocated by unions in declining European industries who argued “work less, work for all” explain the bulk of the difference between the U.S. and Europe. They also argue that these policies may have had a more society-wide influence on leisure patterns because of the existence of a social multiplier where the returns to leisure increase as more people take longer vacations. In the presence of externalities, a very hard question to answer is whether labor regulation introduce distortions that reduce welfare or whether they are a way of coordinating actions on a more desirable equilibrium with fewer hours worked (Cahuc and Postel-Vinay, 2005). One needs to know much more on these externalities to be able to yield some relevant answers to such questions.

3.2 Collective bargaining

In the previous section we pointed out that the impact of reductions in the standard work week on employment is conditioned by the response of wages. In this regard collective bargaining models are particularly useful to study the impact of reduction in working time since collective bargaining coverages are high in most European countries where work sharing policies were discussed or implemented. For instance, according to OECD, collective bargaining coverage is above 90% in Austria, Denmark, Finland, France, Sweden, and above 80 in Italy and the Netherlands. Collective bargaining models (see Booth and Ravallion, 1993, and Contensou and Vranceanu, 2000) help us understanding the influence of the institutional context on the choice of working hours and on the efficiency of reducing working time. It appears that the results depend on a series of features such as the preference for leisure of workers (as above), the bargaining power of employees, the relative weight of employment versus wages in trade union objectives, the degree of coordination of wage bargaining, and the regulation of working conditions. In order to show these results, we first describe the main features of a simple collective bargaining model which includes bargaining on hours (formal details are given in appendix). The chapter on Sweden by O. Nordstrom Skans will illustrate these points.

A simple collective bargaining model

We consider a framework in which a trade-union bargains with a firm over wages and hours. We assume further that a legal constraint imposes an upper limit, on the number of hours worked. In reality, the standard duration should be distinguished from the upper limit for the hours worked above the standard duration are remunerated at a higher rate. To simplify the exposition we will neglect the distinction between the standard duration and the upper limit. We will also assume that the firm

a normal good whose consumption increases with income, higher levels of utility are associated with more leisure and less working hours.

It is interesting to notice that the negotiated level of working hours is also influenced by the elasticity (α) of the revenue function of the firm with respect to the services of labor. This elasticity can reflect two features. First, the monopoly power of the firm on its product market; this elasticity being lower when the firm has strong market power. Second, the degree of centralization of negotiations. When negotiations are centralized, at the industry or the national level, the elasticity of the revenue function is lower because the substitution effects across the goods that are produced by each firm cancel out. Accordingly, strong monopoly power on the product market and highly centralized wage bargaining should lead to low elasticity of the revenue function. It can be shown that negotiated working hours increase with the elasticity of the revenue function. This implies that economies with less competition on the product market and with higher degree of centralization of wage bargaining should display lower working hours.

More jobs with longer working hours!

It turns out that stronger weights (β) on employment in union's objective is conducive to higher hours. When the trade union puts more emphasis on employment, the solution of the negotiations entails more employees, but with a lower level of utility for each employee. Accordingly, working hours increase: each employee works more hours and gets lower weekly wage. This mechanism is exactly the opposite of the so-called work sharing mechanisms in which less working hours increase the number of jobs. Here, when the union puts more emphasis on employment, the negotiation process gives rise to more jobs, but at the expense of employees who are forced to accept utility losses, through lower weekly wage and higher hours.

It is worth noticing that this result is compatible with Hunt's (1999) conclusions in her careful empirical study of working time reductions in Germany over the eighties and the nineties. Hunt concludes her paper by the following statement: "Germany's work-sharing experiment has thus allowed those who remained employed to enjoy lower hours at a higher hourly wage, but likely at the price of lower overall employment". Interpreting her conclusion under the light of our collective bargaining model, it can be argued that it was actually a lower weight of employment in unions' objective that led to German's reductions in working time and to employment cuts in the eighties and the nineties. The Chapter 2 below on Germany shows that other more recent econometric studies confirm Hunt's findings: unions decreased working time in the mid-eighties and the mid-nineties to secure a higher utility for those employed without any positive impact on employment.

It is also interesting to notice that strong unions do not necessarily mean short weekly working hours as far as employment has a large weight in unions' objective. This feature of the behavior of unions is stressed by the Chapter 4 devoted to Sweden.

All the above results assume that the negotiated working hours H_b given by equation (2) are not larger than the authorized upper limit \bar{H} . Conversely, if negotiated standard hours are larger than the authorized working, the actual working time per individual will be equal to the upper authorized limit. Let us examine this case now.

The consequences of reductions in standard hours

The case where the upper authorized limit on hours is binding is interesting for it may help understand whether it is possible to force workers and employers to share employment by imposing a maximum number of hours.

With a simple model of labor demand, we have shown in the previous section that the impact of standard hours reductions on employment hinges on the reaction of wages. In our simple model of wage bargaining, the elasticity of the weekly wage with respect to hours worked (which are equal to \bar{H}) depends on the number of hours worked⁵. This elasticity is positive, hence reductions in standard hours decrease weekly wages. Moreover, this elasticity increases with \bar{H} , which means that reductions in the weekly wage entailed by a standard hours reduction are larger when the number of hours worked is high. Hence, it is easier to increase employment through mandatory reductions in working time when working time is high rather than low. It also turns out that the elasticity of the weekly wage with respect to working hours is larger when the preference for leisure is stronger. Therefore, it should be easier to increase employment through working time reductions when individuals have stronger preferences for leisure.

The knowledge of the wage elasticity with respect to hours allows us to determine the impact of reductions in hours on employment taking into account the wage response. The relation between employment and standard hours (equivalent in this framework to the upper limit \bar{H}) is displayed by the bold curve on figure 3.

Figure 3 indicates that if the upper limit on hours \bar{H} is above the negotiated level H_b , the constraint on the upper limit for hours is not binding and the individual duration of work reaches the value H_b and the employment level is equal to L_b . If \bar{H} is smaller than H_b , the constraint on the upper limit for hours is binding, the individual duration of work equals \bar{H} and the level of employment is given by the bold curve in figure 3 located at the left of point (H_b, L_b) . One sees that employment reaches its maximum for a duration of work denoted by H_{\max} .

Figure 3 shows that reductions in hours worked are favorable to employment if and only if the number of hours worked is above the threshold value H_{\max} . Below this value, the elasticity of the weekly wage with respect to hours becomes too small to allow reductions in working hours to create

⁵It is shown in the appendix that this elasticity amounts to $\bar{H}(1 - \mu)/\mu(H_0 - \bar{H})$.

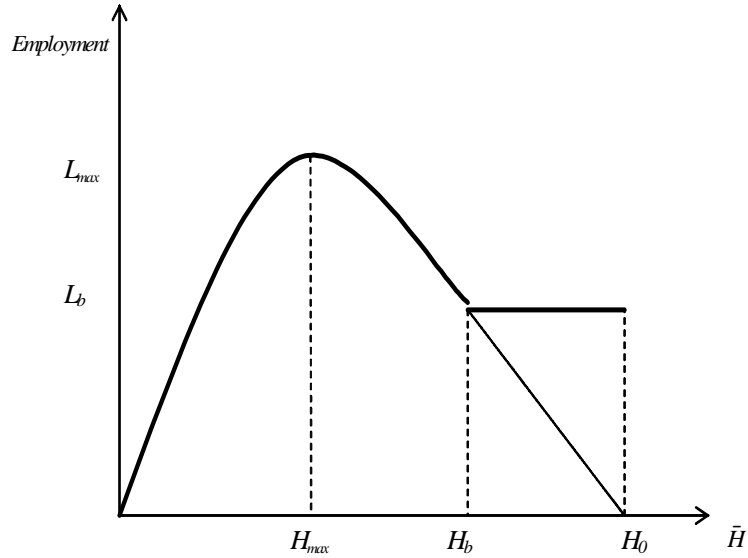


Figure 3: Employment in the collective bargaining model

jobs. In other words, below this value, the hourly wage increases too much when working time is decreased so that working time reductions become bad for employment.

It is shown in the appendix that H_{\max} is equal to the number of hours negotiated H_b when the union disposes of all the bargaining power. It is also shown that H_{\max} decreases with the preference for leisure, the market power of the firm, and the degree of centralization of wage bargaining. These results mean that it is possible to increase employment through mandatory working time reductions for low values of working hours in economies in which workers display a strong preference for leisure, where unions' bargaining power is strong, where collective bargaining is highly centralized, and firms have strong market power.

Reductions in working time and working conditions

The impact of reductions in working time on employment is also influenced by interactions between working conditions and working time. This influence shows up when one notices that the threshold value, H_{\max} , increases with the elasticity ε of labor services with respect to hours. At this point, it should be noticed that the elasticity of labor services with respect to hours is influenced by the possibility to reorganize production when working time is decreased. This elasticity ought to be smaller for mandatory reductions in working time when firms have more possibilities to reorganize production. The reorganization of production could be considered as endogenous as in the contributions of Askenazy (2004) and d'Autume (2001) who provide bargaining models that analyze the connections between working time, hours flexibility, and labor effort. These models show that in return for higher hourly wages, trade unions consent to greater management-controlled hours flexibility. Hours flexibil-

ity, in turn, leads to a deterioration in working conditions, including an intensification of labor effort. In this type of model, shorter working time may increase work effort and deteriorate working conditions. The Chapters 3 and 2 below show that reductions in working time in France and in Germany have been accompanied by more flexible hours and some deteriorations in working conditions.

From this point of view, stringent regulations of working conditions, which hinder workplace reorganization, lead to high elasticities of labor services with respect to working hours in the case of compulsory reductions in working time. Therefore, compulsory reductions in working time are less likely to create jobs when there are stringent regulations on working conditions.

In sum, models of bargaining over the number of hours to be worked show that union power should exert downward pressure on these hours. It also turns out that forcible reductions in the number of hours worked have a more favorable impact on employment when the union's bargaining power is low. More generally, reductions in working time can increase employment if trade unions do not get all bargaining power. Moreover, in this context, compulsory reductions in working time increase the utility of the trade-union, because the utility of employees remains unchanged when working time is reduced whereas the number of jobs increase. Obviously, this process makes sense only for small enough reductions in working hours such that the number of hours worked remains above a certain limit that depends on the preferences of individuals and on the technology. From this point of view, monopsony models of the labor market deliver the same type of result.

3.3 Monopsony power

Marimon and Zilibotti (2000), Contensou and Vranceanu (2002) and Rocheteau (2002) have shown, in matching models à la Pissarides (2000), that starting from a *laissez-faire* economy in which firms have some monopsony power, small reductions in working time result in increases in the equilibrium employment while large reductions reduce employment. Furthermore, it appears that small reductions in working hours can improve the welfare of employees. Manning (2001) obtains the same type of results in pure monopsony models where it is shown that compulsory restrictions on hours or working conditions can improve workers' welfare.

The choice of wage and hours

The monopsony firm offers contracts over wage and hours that maximizes its profit knowing that the labor supply depends on hours and wages. If there is no legal upper limit on hours worked, it is shown in the appendix that a monopsony that seeks to maximize its profits subject to this labor supply constraint will choose a wage smaller than the competitive wage and a work duration larger than the competitive work duration.

Compulsory reductions in working hours

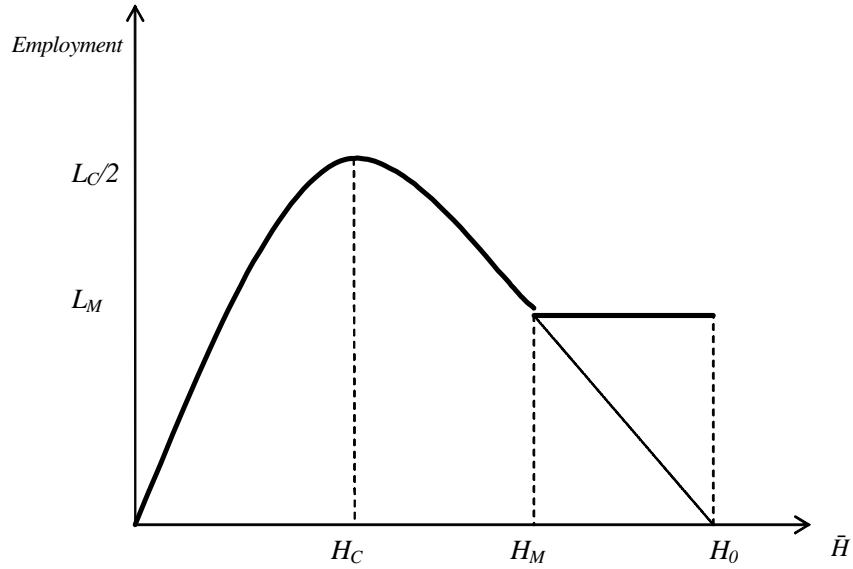


Figure 4: Employment in a monopsony model with a constraint on hours worked.

Let us now assume that there is an upper limit \bar{H} on hours worked. The results are displayed on figure 4 (see the model in the appendix for the calculations). The figure presents employment as a function of the upper limit on hours, \bar{H} . If \bar{H} is larger than the duration of working time chosen by the monopsony, and denoted by H_M , the monopsony is not constrained on its decisions, the individual duration of work reaches the value H_M and employment reaches a level denoted by L_M . If the upper limit \bar{H} is smaller than H_M , the monopsony is constrained to set working hours to \bar{H} and the level of employment is given by the bold curve in figure 4. One sees that compulsory reductions in working time increase employment as long as working time is above the competitive level H_C . Conversely, reductions in working time \bar{H} decrease employment when \bar{H} is below the competitive level.

These results are strikingly reminiscent of the effects of the minimum wage as analyzed by Stigler (1946) who showed that the relationship between employment and the minimum wage is not monotonic but increasing for low values of the minimum wage and decreasing for higher ones when the labor market is monopsonistic.

Figure 4 also shows that the maximum employment attainable by a monopsony happens for a duration of working time, denoted by H_C , which is equal to the level that arises in the competitive case (see appendix). This means that employment reaches its maximum level when the law forces the monopsony to set its individual working time at the competitive level. However, in this latter case, employment is lower than its competitive equivalent because the wage set by monopsony is smaller than in the competitive case. Hence, regulations on working hours can improve employment and welfare but cannot alone help reach the first best situation. To do this, it is necessary to have a

second instrument; a minimum wage. Imposing a minimum wage higher than the monopsony wage and reducing the working time improves the welfare of workers (see the appendix for details).

To summarize, monopsony models and bargaining models show that regulation of working hours can improve employment and welfare of workers. However, these models also show that compulsory reductions in hours are not likely to improve employment and welfare in any systematic fashion. Indeed, heterogeneity in preferences as well as in individual productivities imply heterogeneous choices in working hours that cannot be efficiently regulated by a single constraint on working time since this constraint never accounts for the diversity of people.

4 Conclusion

Let us now sum-up the main conclusions of this chapter in order to provide a road map for the next chapters devoted to the working time policies of Germany, France, Sweden and the Netherlands.

- First, compulsory reductions in standard hours can increase employment only in very special circumstances that are very rarely met in the real world. In particular, it is generally not possible to increase employment by reducing working hours if there is full wage compensation. Accordingly, compulsory reductions in working time must be accompanied by wage subsidies to get positive employment effects when there is full wage compensation.

- Second, cross-country differences in working time can be related to differences in institutions and cultures. Elements such as family values, trade union density, the degree of centralization of wage bargaining, the weight of employment in trade-unions' objectives, influence both hours and employment. In this realm, economic analysis shows that some popular ideas might be misleading. For instance, according to economic analysis, trade-unions which put a strong weight on employment ought to support long working hours and low wages rather than short working hours.

- Imperfect competition may imply that state regulations of hours are required. However, this does not mean that systematic reductions in standard hours can improve employment or welfare. Actually, very little is known on the efficient way to regulate hours.

Appendix

A Labor demand elasticities

The working time of each worker determines the number of units of labor services that he provides. This number can be represented by an increasing function of working time, H , denoted $e(H)$. If N designates the number of persons employed in the firm, then labor services are expressed by the product $Ne(H)$, assuming, for the sake of simplicity, that all employees work the same amount of hours.

Denoting by $d(H)$ the duration of capital utilization, capital services are expressed by the product $Kd(H)$ where K designates the stock of capital. One should expect the function $d(H)$ to increase with the duration of work. Finally the output Y produced by a firm is a function of K , N and H that can be written as $Y = F[Kd(H), Ne(H)]$.

Let us consider a firm whose profits read

$$\Pi = F[Kd(H), Ne(H)] - \Omega N$$

where F is a production function with constant returns to scale. Let us denote by σ the elasticity of substitution between capital and labor and by R the user cost of capital. Log-differentiation of the first-order condition

$$\frac{e(H)F_2(d(H)K, e(H)N)}{d(H)F_1(d(H)K, e(H)N)} = \frac{\Omega}{R}$$

with respect to K and N yields

$$\delta K \left[\frac{F_{21}d}{F_2} - \frac{F_{11}d}{F_1} \right] + \delta N \left[\frac{F_{22}e}{F_2} - \frac{F_{12}e}{F_1} \right] = \frac{\delta \Omega}{\Omega} - \frac{\delta R}{R}$$

Noticing that the homogeneity of degree one of the production function implies that $F_1Kd + eNF_2 = F$, $F_{11}Kd = -F_{12}eN$ and $F_{22}eN = -F_{12}Kd$, the last equation reads

$$\left(\frac{\delta K}{K} - \frac{\delta N}{N} \right) = \frac{F_1F_2}{F_{12}F} \left(\frac{\delta \Omega}{\Omega} - \frac{\delta R}{R} \right)$$

which is equivalent to

$$\sigma = \frac{F_1F_2}{F_{12}F} = \frac{-d(H)KF_1F_2}{e(H)NF_2} \quad (\text{A1})$$

Now, let us consider that the capital stock is given. The first-order condition with respect to employment reads

$$e(H)F_2(d(H)K, e(H)N) = \Omega$$

Log differentiation of this first-order condition yields

$$\frac{\delta H}{H} \left(\eta_H^e + \frac{F_{21}Kd(H)}{F_2} \eta_H^d + \frac{F_{22}Ne(H)}{F_2} \eta_H^e \right) + \frac{\delta N}{N} \left(\frac{e(H)NF_2}{F_2} \right) = \frac{\delta \Omega}{\Omega}$$

where η_H^x , denote the elasticity of function $x = e, d$, with respect to hours.

Using equation (A1) and the definition of the share of capital costs at the optimum, which reads $\alpha = d(H)F_1/F$, one gets the elasticity of employment with respect to hours:

$$\eta_H^N = \eta_H^d + \left(\frac{\sigma - \alpha}{\alpha} \right) \eta_H^e - \frac{\sigma}{\alpha} \eta_H^\Omega \quad (\text{A2})$$

where η_H^Ω stands for the elasticity of the weekly wage with respect to hours. Equation (A2) shows that reductions in working time decrease employment when there is full wage compensation ($\eta_H^\Omega = 0$) if $\eta_H^d \geq 0$, $\eta_H^e \geq 0$ and the elasticity of substitution between capital and labor services σ is larger than the share of capital in total costs α . These conditions, which are very weak, are generally satisfied.

The results given in tables 2 and 3 assume that $\alpha = 0.3$ and $\sigma = 0.5$.

B The collective bargaining model

B.1 The Nash criterion

The outcome of the bargaining process is represented by the generalized Nash bargaining solution where the relative bargaining power of the union is denoted by γ $\alpha \in [0, 1]$. We assume further that a legal constraint imposes an upper limit, denoted by \bar{H} , on the number of hours worked. In reality, the standard duration should be distinguished from the upper limit for the hours worked above the standard duration are remunerated at a higher rate. To simplify the exposition we will neglect the distinction between the standard duration and the upper limit. We will also assume that the firm keeps the “right to manage” that signifies that employment is chosen by the firm, once hours and wages have been negotiated.

The union’s objective is to maximize a function that depends on employment, denoted by L , and on the net utility gains of employees. The net utility gain is defined as the difference between the utility of an employee and of an unemployed worker. The utility of an employee amounts to $v(\Omega, H_0 - H)$, where Ω , H_0 and H denote respectively income, time allocation, and actual hours worked; $v(\cdot)$ is a utility function increasing with respect to both arguments. The utility of an unemployed worker amounts to $v(b, H_0)$, where b stands for the income of unemployed workers. For the sake of simplicity, we assume that $v(\Omega, H_0 - H)$ is a Cobb-Douglas function that takes the form $\Omega^\mu (H_0 - H)^{1-\mu}$, where $\mu \in (0, 1)$ measures the relative weight of income with respect to leisure in workers’ preferences. A higher value of μ corresponds to stronger preferences for income with respect to leisure. The relative weight of employment in trade-union’s objective is denoted by $\beta \in (0, 1)$. Accordingly, the objective of the trade-union writes as $L^\beta [v(\Omega, H_0 - H) - v(b, H_0)]^{1-\beta}$

The production of the firm depends on the number L of workers hired and the hours of work H . The efficiency of hours worked by each employee is assumed to be an increasing function with constant elasticity denoted by ε , hence $e(H) = H^\varepsilon$. For the sake of simplicity, we assume that the revenue of the firm is also described by an iso-elastic function taking the form $R[e(H)L] = [e(H)L]^\alpha/\alpha$, with $\alpha \in (0, 1)$. Therefore, the profit of the firm is $R[e(H)L] - \Omega L$.

The union's objective reads:

$$\mathcal{V}_s = \ell^\beta [v(\Omega, H_0 - H) - v(\bar{w}, H_0)]^{1-\beta} \quad , \quad \ell = \text{Min}(1, L/N)$$

In this expression, N designates the (exogeneous) size of the union. When employment is equal to L and each employee supplies H hours, the firm's profit takes the following form:

$$\Pi = \frac{1}{\alpha} [e(H)L]^\alpha - \Omega L \tag{B3}$$

We assume that the firm retains the right-to-manage. Here, this hypothesis signifies that the employer decides on the size of his or her workforce after bargaining over the hourly wage w and the number H of hours to be worked has been completed. In these conditions, labor demand, denoted by $L(\Omega, H)$, is found by maximizing profit, with Ω and H taken as given. Setting the derivative of (B3) to zero with respect to L , we get:

$$L(\Omega, H) = [e(H)]^{\frac{\alpha}{1-\alpha}} \Omega^{\frac{1}{\alpha-1}} \tag{B4}$$

When this value of labor demand does not exceed the size N of the union, the profit of the firm is expressed thus:

$$\Pi(\Omega, H) = \left(\frac{1-\alpha}{\alpha} \right) \left[\frac{e(H)}{\Omega} \right]^{\frac{\alpha}{1-\alpha}}$$

Assuming that if there is failure to reach agreement the firm obtains zero profit, the issues of bargaining corresponds to the solutions of the maximization of the following Nash criteria:

$$\text{Max}_{\{\Omega, H\}} \left[\frac{L(\Omega, H)}{N} \right]^{\beta\gamma} [v(\Omega, H_0 - H) - v(\bar{w}, H_0)]^{\gamma(1-\beta)} [\Pi(\Omega, H)]^{1-\gamma}$$

subject to:

$$L(\Omega, H) \leq N \quad \text{and} \quad H \leq \bar{H}$$

B.2 The optimal number of hours worked

Interior solutions

For an interior solution, the derivatives of the logarithm of the Nash criterion with respect to Ω and H yield the first-order conditions. They are written:

$$\frac{(1-\beta)\gamma v_1(\Omega, H_0 - H)}{v(\Omega, H_0 - H) - v(\bar{w}, H_0)} = \frac{\alpha(1-\gamma) + \gamma}{(1-\alpha)\Omega} \tag{B5}$$

$$\frac{(1-\beta)\gamma v_2(\Omega, H_0 - H)}{v(\Omega, H_0 - H) - v(\bar{w}, H_0)} = \frac{\alpha\varepsilon(\beta\gamma + 1 - \gamma)}{(1-\alpha)H} \tag{B6}$$

Dividing these last two relations member to member, we get:

$$\frac{v_1(\Omega, H_0 - H)}{v_2(\Omega, H_0 - H)} = \frac{H}{\Omega} \frac{\alpha(1-\gamma) + \beta\gamma}{\alpha\varepsilon(\beta\gamma + 1 - \gamma)} \tag{B7}$$

This last equation defines the marginal rate of substitution between income and leisure as a function of the hourly wage $W = \Omega/H$ and the elasticity ε of individual productivity with respect to hours. The general study of the system formed by equations (B5) and (B6) is possible, but we will arrive at the main results more rapidly by assuming that the utility of each member of the union is a function of the Cobb-Douglas type $v(\Omega, H_0 - H) = \Omega^\mu (H_0 - H)^{1-\mu}$, with $\mu \in]0, 1[$. In particular, equation (B7) then immediately gives us the number of hours worked:

$$H_b = \frac{\varepsilon\mu\alpha [1 - \gamma(1 - \beta)]}{(1 - \mu)[\gamma\beta + \alpha(1 - \gamma)] + \varepsilon\mu\alpha [1 - \gamma(1 - \beta)]} H_0 \quad (\text{B8})$$

The parameter μ is interpreted as a measure of the importance of income with respect to leisure for each worker. Equation (B8) shows that the optimal number of hours worked is an increasing function of this parameter, and of elasticity ε . In consequence, constraint $H_b \leq \bar{H}$ is less likely to be binding if this elasticity is weaker, or if workers attach less importance to income than they do to leisure.

Constrained solutions

Let us now assume that there is a compulsory number of hours, \bar{H} , lower than the number arrived at through bargaining, defined by equation (B8). The negotiated wage is then given by equation (B5) with $H = \bar{H}$. Assuming, as above, that preferences are of the Cobb-Douglas type, this equation implicitly defines the negotiated wage as follows:

$$\Omega^\mu (H_0 - \bar{H})^{1-\mu} = \frac{\alpha(1 - \gamma) + \gamma\beta}{\alpha(1 - \gamma) + \gamma\beta - \gamma\mu(1 - \beta)(1 - \alpha)} v(\bar{w}, H_0) \quad (\text{B9})$$

with $\alpha(1 - \gamma) + \gamma\beta - \gamma\mu(1 - \beta)(1 - \alpha) > 0$.

Since the right-hand side of this equation does not depend on hours, we deduce from it the elasticity η_H^Ω of the weekly wage with respect to hours \bar{H} . We thus arrive at $\eta_H^\Omega = \bar{H}(1 - \mu)/\mu(H_0 - \bar{H})$.

When $H = \bar{H}$, equation (B4) defining labor demand gives the employment level which is thus equal to $L(\Omega, \bar{H})$. As the negotiated global wage Ω depends also on \bar{H} – see equation (B9) –, the employment level $L(\Omega, \bar{H})$ can be considered as a function of \bar{H} . Deriving this function with respect to \bar{H} , one sees that the employment level reaches a maximum when \bar{H} is equal to H_{\max} defined by:

$$H_{\max} \equiv \frac{\varepsilon\mu\alpha}{(1 - \mu) + \varepsilon\mu\alpha} H_0 \quad (\text{B10})$$

Comparison of equations (B8) and (B10) indicates that H_{\max} is equal to the number of hours negotiated H_b when the union disposes of all the bargaining power ($\gamma = 1$). Since the negotiated number of hours H_b decreases with the bargaining power γ of the workers, one always has $H_b > H_{\max}$ for $0 < \gamma < 1$. Finally, noticing that H_{\max} does not depend on \bar{H} , one obtains Figure 3 that represents the employment level as a function of \bar{H} .

C The monopsony model with hours

The preferences of individuals over income and hours are represented by the utility function $v(WH, H_0 - H) = (WH)^\mu (H_0 - H)^{1-\mu}$ where W and H respectively represent the hourly wage and the number of hours worked. For the sake of simplicity, it is assumed that each hour of work produces a constant quantity of good denoted by y , so that profits per employee write $(y - W)H$. Moreover, it is assumed that individuals are heterogeneous with respect to the level of utility received when not working. More precisely, we assume that the non market income of idle persons is described by a cumulative distribution function denoted by $G(\cdot)$. Hence, an idle person with non market income R has utility level $R^\mu H_0^{1-\mu}$. Thus, only the individuals for whom $R^\mu H_0^{1-\mu} < (WH)^\mu (H_0 - H)^{1-\mu}$ accept jobs with a wage W and working hours H . If the working age population is normalized to one, labor supply is simply $G(WH [(H_0 - H)/H_0]^{\frac{1-\mu}{\mu}})$.

The equilibrium with perfect competition is characterized by a zero profit condition for firms. The competitive equilibrium hourly wage is thus equal to the productivity of an hour of labor, i.e. $W_C = y$. Given this wage, individuals work a number of hours, denoted by H_C , that maximizes their utility, and employment attains the level L_C given by $G(yH_C [(H_0 - H_C)/H_0]^{\frac{1-\mu}{\mu}})$.

The equilibrium with perfect competition is characterized by a zero profit condition for firms. The competitive equilibrium hourly wage is thus equal to the productivity of an hour of work, i.e. $W_C = y$. Given this wage, the utility level of a worker is given by $(yH)^\mu (H_0 - H)^{1-\mu}$. Maximizing this last expression with respect to H yields the competitive individual labor supply denoted by H_C . One gets $H_C = \mu H_0$. Employment corresponds to aggregate labor supply that reads $G(yH_C [(H_0 - H_C)/H_0]^{\frac{1-\mu}{\mu}})$. For the sake of simplicity, it is assumed in the sequel that G is uniform over the interval $[0, R_u]$, $R_u > y$, thus $G(R) = (R/R_u)$ and the competitive equilibrium is finally described by:

$$W_C = y, \quad H_C = \mu H_0, \quad L_C = \frac{y}{R_u} H_C \left(\frac{H_0 - H_C}{H_0} \right)^{\frac{1-\mu}{\mu}} \quad (\text{C11})$$

For any wage and hours (W, H) , the profit of the monopsony is equal to $(y - W)HG \left[WH \left(\frac{H_0 - H}{H_0} \right)^{\frac{1-\mu}{\mu}} \right]$. When $G(R) = (R/R_u)$, neglecting exogenous parameters the monopsonist problem reads

$$\max_{(W,H)} (y - W) WH^2 (H_0 - H)^{\frac{1-\mu}{\mu}}$$

subject to:

$$H \leq \bar{H} \quad (\text{C12})$$

This problem is separable in W and H . The interior solutions are given by:

$$W_M = \frac{y}{2}, \quad H_M = \frac{2\mu}{1+\mu} H_0, \quad L_M = \frac{y}{2R_u} H_M \left(\frac{H_0 - H_M}{H_0} \right)^{\frac{1-\mu}{\mu}}$$

One sees that $W_M < W_C$, $H_M > H_C$ and $L_M < L_C$.

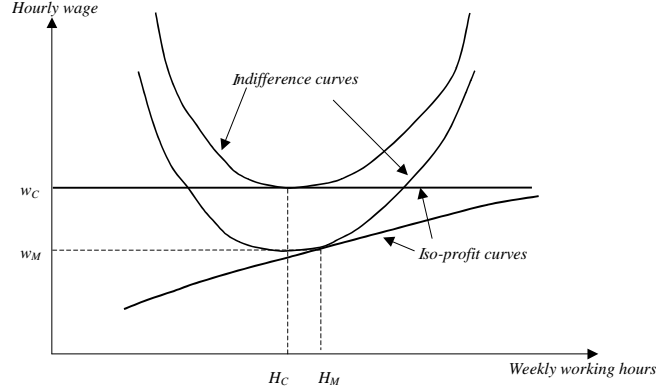


Figure 5: Hours and wages in the monopsony model. W_C and H_C stand for the hourly wage and the working hours in the competitive equilibrium. Subscript M designates the monopsony solution.

When $H_M > \bar{H}$, the solutions of the monopsony are given by:

$$\bar{W}_M = \frac{y}{2}, \quad \bar{H}_M = \bar{H}, \quad \bar{L}_M = \frac{y}{2R_u} \bar{H} \left(\frac{H_0 - \bar{H}}{H_0} \right)^{\frac{1-\mu}{\mu}} \quad (\text{C13})$$

The results are displayed on figure 5. It shows that the monopsony chooses a contract with a lower hourly wage and higher hours than in the competitive situation. Therefore, workers get lower utility than in the competitive equilibrium, which implies that employment is lower than in the competitive equilibrium.

On figure 5 we have drawn the function $L(\bar{H}) = \frac{y}{2R_u} \bar{H} \left(\frac{H_0 - \bar{H}}{H_0} \right)^{\frac{1-\mu}{\mu}}$ that reaches its maximum at $\bar{H} = H_C$. When \bar{H} varies from 0 to H_0 , the solutions of the monopsony are represented by the bold curve in figure 5. It is worth noticing that the highest employment level attainable by the monopsony is obtained when it is constrained to accept the competitive level of hours, i.e. when $\bar{H} = H_C$. In that case, (C11) and (C13) show that the monopsony sets employment to the level $L_C/2$ which is of course smaller than the competitive level L_C . These results prove that regulating a monopsony by means of the duration of work can improve employment (see the comments in the main text) but cannot reach the first best optimum. For this it is also necessary to impose a minimum wage greater than the wage set by the monopsony. In this simple model, the minimum wage should be set equal to y (the level of the competitive wage) which is greater than the monopsony wage equal to $y/2$.

Chapter 2: Working Time Developments in Germany*

1. Introduction

During the last 30 years, the length of the standard work week has been a contentious topic in Germany. In the 1980s and the 1990s, trade unions reached agreements to reduce normal hours, in order to raise employment.¹ In this chapter, we will first give an overview of the institutional context and the development of normal hours worked in Germany (Section 2). Economists are typically skeptical about the effectiveness of a work-sharing policy (i.e. the concept of the redistribution of a given amount of work over more employees). One of the reasons is the corresponding rise in labor costs if employees are compensated by the fall in income through lower hours (see also the theoretical chapter of this part of the book). Section 3 provides a review of the econometric evidence for Germany on the impact of reductions in standard hours on employment and wages.

As is highlighted in Section 4, reductions in standard hours were accompanied by various forms of flexible working time arrangements. During the last couple of years, the public debate in Germany on working time has experienced a complete redirection. Employer associations demand an increase in standard hours to lower labor costs and to secure the international competitiveness of German companies. This, of course, is often confronted with the resistance of trade unions which claim that employers merely take advantage of the economic downturn in Germany to increase their profit situation. Section 5 describes some well-known examples of firms which have increased normal hours and simultaneously pronounced job guarantees. Union advocates, however, fear that longer hours generally increase unemployment, which is basically the analogy to the work-sharing argument mentioned above. Based on the IAB-Establishment Panel, Section 6 presents an empirical analysis on the relationship between changes in standard hours and employment (and labor productivity) growth. This is a first attempt to evaluate whether or not longer working hours have indeed stabilized employment or vice versa. Section 7 presents some concluding remarks.

* We thank Claus Schnabel for helpful comments on various issues.

¹ Synonyms throughout this chapter are normal working time, standard hours, normal hours and standard work week. They all denote the stipulated weekly working time and are in contrast to actual hours worked, which also include overtime hours.

2. Hours reductions in Germany

The working time law from 1938 set a maximum of 48 hours (including overtime) per week and eight hours per day, with a general ban on Sunday work. More recently, a new working time law (*Arbeitszeitgesetz*), introduced in 1994 to transpose the provisions of the EU working time directive from 1993 into national law, allows for a temporary extension of the working week up to 60 hours as long as the daily working time does not exceed 8 hours when averaged over six months.

However, these statutory provisions are often not binding, namely when working time relations are determined by collective bargaining. This takes place mainly at the regional industry-wide level with more than 1,100 bargaining branches, though agreements within an industry (across regions) are usually very similar. Collective bargaining may also be conducted between a union and a single employer at the company level.² Coverage by industry-wide agreements has fallen in recent years, though it is still much more important than firm-level bargaining. In 2004, approximately 41 (19) percent of Western (Eastern) German plants applied bargaining agreements from the industry level, but only 2.4 (4.0) percent were covered by company level agreements (own calculations with the IAB-Establishment Panel).³ Since the incidence of unionization is positively related with firm size, the coverage rate of employees is much higher.⁴ About 61 (41) percent of Western (Eastern) German employees work in companies covered by industry-wide bargaining, while firm level agreements apply for 7.1 (11.7) percent of the workforce.⁵

The metal and engineering workers' union (IG Metall), with 2.5 million members in 2005 the second biggest union in Germany, has played a dominant role in post-war bargaining.⁶ In the metal-working industry, normal working time was reduced from 48 hours to 45 hours per week in 1956 and to 40 hours in 1967 (Bosch 1990). Given the rapid economic growth during this period, the cuts in normal working time were implemented without major economic dispute and were intended to enhance the quality of life. With other industries following these settlements several years later, by 1975 the prevailing conditions for full-

² Well-known examples for agreements from the firm-level are Lufthansa, Siemens, Volkswagen, Deutsche Telekom or the oil companies.

³ Various statistics and regressions reported throughout this chapter are based on the IAB-Establishment Panel. See Box 1 in the Appendix for a description of this data-set.

⁴ Unlike in the US but as in France or most European countries, collective bargaining agreements apply in practice to all workers of a company, not only to union-members.

⁵ These numbers have fallen considerably since 1996 when 69 (56) percent of Western (Eastern) German employees worked in companies covered by industry-wide bargaining and 11.1 (16.7) of the workforce was covered by firm-level agreements.

⁶ IG Metall was by far the biggest union until 2001 when the five unions of the service sector merged into *ver.di*, which comprised at the end of 2003 about 2.6 million members (IWD, 08.01.2004, p. 2).

time workers were six weeks of annual holidays and just above 40 hours per week (see also Figure 1).

Given the rising unemployment in the seventies, in 1978-1979 IG Metall launched a campaign to reduce standard working time below 40 hours in order to promote work-sharing. While their attempts failed in the face of employers' strong resistance, they were more successful a few years later, when, after a seven-week strike in 1984, normal working time was reduced to 38.5 hours in 1985. This was followed by further agreements between IG Metall and Gesamtmetall (the metal and engineering employers' association) on reductions of standard hours to 37 hours in 1988, to 36 hours in 1993 and to 35 hours in 1995.

The IG Metall set a benchmark and some other industries, including the steel and printing sectors, followed the metal-working industry to reach the 35 hours level by 1995. The timber industry implemented a 35 hours week in 1997 and the paper industry did likewise in 1998. Other sectors also reduced standard working time, but not down to 35 hours: the chemical industry to 37.5 hours in 1993, the building industry to 39 hours in 1990, the textile and clothing industry to 37 in 1994 or the retail sector to 37.5 in 1991.^{7,8}

The most prominent firm-level agreement on working time reductions has been the settlement between Volkswagen AG and IG Metall. Facing an economic recession in the early 1990s, the management intended to cut employment by 30,000 (out of 100,000) jobs. In November 1993, however, an agreement was reached on (i) a reduction in working time from 35 to 28.8 hours (ii) a reduction in the yearly gross income by 16 percent and (iii) no resort to redundancies until 1997.⁹

The development of standard hours as negotiated by collective bargaining between 1973 and 2004 is also displayed in Figure 1. For Western Germany, there is a downward trend between the mid-eighties and the mid-nineties, but before and afterwards bargained standard hours remain stable.¹⁰ Negotiated standard working time is higher in Eastern Germany, where in 2004 the average standard working time amounts to

⁷ All of these figures refer to Western Germany. Standard hours in the Eastern German metal industry, for example, were reduced to 39 in 1994 and to 38 in 1996.

⁸ Reductions in working time were also achieved through the increase in annual holiday entitlements. In this chapter, we focus on the standard work week and ignore reductions in the yearly holidays. First of all, there is no information in the IAB-Establishment Panel. Second, the variation in the average number of vacation days is less important. For example, the average number of collectively agreed days rose in Western Germany between 1985 and 1998 from 29.0 to 29.5 (Müller-Jentsch & Ittermann, 2000).

⁹ Unfortunately, there is no but anecdotal evidence on whether or not moonlighting increased, but Promberger et. al (1996) reported that 46 percent of Volkswagen's workforce desired either more hours or more work.

¹⁰ Since the figure is aggregated over all industries, it obviously masks any differences between sectors. However, it should be noted that the depicted trend is not the outcome of a shift in the sectoral decomposition of the economy.

39 hours, as opposed to 37.35 in Western Germany. The gap has been reduced slightly from 2.2 hours in 1993 to 1.65 hours in 2004 since there was a (modest) fall of standard hours in Eastern Germany after 1995.

Standard hours which are actually applied in companies often deviate from the bargained standard hours discussed above. First, about 30 (45) of the employees in Western (Eastern) Germany work under individual regulation (in contrast to collective bargaining). Second, there is an increasing level of working time flexibility at the company level (see below). Figure 3 shows the development of standard hours between 1995 and 2004 as measured at the company level, separately for the three bargaining regimes (none, industry level, firm level) and for Western and Eastern Germany.¹¹ As expected, standard hours are highest for plants not applying any bargaining agreement. In 2004, they exceeded the average standard work week in plants with a bargaining agreement from the industry level by one (a half) hour in Western (Eastern) Germany. Hence, the difference is not very large and, in addition, within Eastern and Western Germany the movement of standard hours is almost parallel between both bargaining types. This clearly indicates that plants with individual contracts have working time regulations that resemble to a considerable degree those adopted in collective agreements.

Standard hours have fallen slightly in Eastern Germany. This is consistent with Figure 1 and due to the fact that after 1995 there were occasional reductions in bargained standard hours in the East. In Western Germany, by contrast, standard hours in plants with bargaining agreements applied from the industry level have slightly gone up between 1997 and 2004. The rise is only modest and amounts to about a quarter of an hour, but stands in contrast with Figure 1. Evidently, some companies made use of the possibility to deviate from collectively agreed working time standards under certain circumstances. Standard working time in plants with a firm-level agreement in the East is very close to industry-wide arrangements, whereas in 2004 in the West, it is about half an hour lower than hours worked in plants with industry-level contracts.

Figure 4 depicts the dispersion of standard hours, measured at the company level, again stratified by bargaining regime and by region. These statistics are calculated using controls for industry and firm size (separately for each year, each bargaining regime and for Eastern and Western Germany) to remove the effect of a different sector and size structure between the bargaining regimes (and between Western and Eastern Germany). The following tendencies clearly appear: (i) The variation is largest for Western

¹¹ These figures are based on own calculations with the IAB-Establishment Panel. Unfortunately, the data-set does not contain information on standard hours in 2000 and 2003. The Establishment Panel starts in 1993 (1996) for Western (Eastern) Germany, but information on the bargaining regime is available only from 1995 onwards.

German plants without a bargaining contract. (ii) By 2004, the variation for the other five groups is literally identical. (iii) The deviation rises for Western German plants applying an industry-level agreement. This comes from the fact that more companies make use of the opting-out possibility (see below). For Eastern German plants with an industry-wide agreement, the series shows only an upward trend since 1999. (iv) The depicted series fluctuate most for plants with a firm-level agreement, a potential reflection of a lower sample size.

The (between-plant) dispersion of standard hours and its difference between Eastern and Western German can also be seen from Table 1, which reports the distribution of normal hours across employees. While the standard work week amounts to 40 hours for 70 percent of the workers in the East, this is only the case for one out of four workers in the West. However, almost every other employee works between 37.5 and 38.5 hours in Western Germany, but only thirteen percent of the workers in Eastern Germany. Finally, it is often assumed that the 35-hour work week predominates in Germany, but Table 1 shows that this only holds for ten percent of the employees in Western Germany, and only for a minority of 1.3 percent of the Eastern German workforce.

Actual hours worked may also differ from bargained standard hours due to the use of overtime. Figure 2 shows that there has been a downward trend in paid overtime hours between 1970 and the beginning of the nineties, after which they remained fairly stable in Western Germany. At least from these aggregated statistics, there is no apparent substitution towards more overtime after the reduction in the standard work week. On average, a West German full-time employee works only slightly more than 1 paid overtime hour per week. This is much lower than in the U.S. or the United Kingdom, for example. East German employees work even less overtime, presumably because of a higher standard working time as well as because of the deteriorated economic situation.

While aggregate statistics for bargained standard hours are remarkably stable for Western Germany and fall only slightly for Eastern Germany between 1996 and 2004 (see Figure 1), we do observe significant changes in standard working time at the company level. On average, between two consecutive waves of the IAB-Establishment Panel, 14.3 (13.2) percent of the Western German plants increased (lowered) their standard hours. The respective numbers are a bit lower for the sample of Eastern German plants, but still amount to 10.2 (7.2) percent. There is also a considerable proportion of companies changing their bargaining regime. 16 (19) percent of Western (Eastern) German plant-year observations report a different bargaining status than in the previous survey.

To investigate the relationship between adjustments in standard working time and changes in the bargaining regime, we have run a basic OLS regression with the change in standard hours as the dependent variable and the bargaining regime in the current and in the previous year on the right-hand-side. Since three different bargaining status (none, industry-level and firm-level) exist, there are nine possible transitions between two years, which are all (but one) included as dummy variables. We also added a variable indicating the existence of a works council and year dummies.¹² We have investigated the relationship separately for Western and Eastern Germany, both with and without weights. The results are reported in Table 2.

First of all, changes in standard working time implemented at the company-level remain almost fully unexplained. Second, within-company changes in standard hours do not differ between plants which apply an industry-level agreement in two consecutive survey waves and those plants which are without a bargaining agreement in both years. This is consistent with Figure 3 which shows an almost identical development between both plant-types. Third, and most interestingly, plants without a bargaining contract which have left an industry-wide agreement in the previous year, have increased their standard hours since then. The coefficients from the weighted regressions imply that the difference in working time between these plants and companies which kept their industry-wide contract rose by 33 (14) minutes in Western (Eastern) Germany. Fourth, the existence of a works council hardly influences the development of standard hours within a plant. Its coefficient is (weakly) significant only in the weighted regressions, but even there the implied effect amounts to a few minutes.

3. The impact of reductions in standard hours on employment and wages in Germany: Empirical Evidence

German trade unions achieved reductions in standard working time since the mid-eighties, aiming to induce work-sharing. As has been outlined in the theory chapter, the success of such a policy also depends on the wage compensation mechanism, on potential adjustments in labor productivity following a cut in standard hours, as well as on the objectives of the unions.

Hunt (1999, p. 118) noted with respect to the impact of standard hours reductions that in Germany "...it is generally believed that employment rose, despite an almost total absence of econometric evidence."

¹² Dummies for sectoral affiliation and firm size have been dropped since both groups turned out to be insignificant.

Instead, the existing (pro work-sharing) evidence was generally based on case-studies, surveys of firms, macro-economic simulations or component calculations (decomposing *ex post* changes in production into three components: hourly productivity, employment and hours of work).¹³ This section provides a summary of the econometric evidence on the effects of standard hours reductions in Germany.

A precondition for work-sharing to work is that firms do not expand overtime to off-set the reduction in standard hours. This seems to be of a smaller problem in Germany, however. For example, Hunt (1999) finds with individual-level data from the GSOEP, 1984-1994, that a one-hour-reduction in standard hours has reduced actual hours for hourly-paid workers (*Arbeiter*) in the production sector between 0.88 and 1 hour. Hence, overtime hours have increased by at most 7 minutes.^{14,15}

German unions have usually claimed to have achieved full wage compensation (*Lohnausgleich*), but Hunt (1999) notes that it is not clear what is implied by this term. The confusion arises because no account is taken of how much hourly wages would have been increased (due to productivity improvements) if there were no reductions in normal working time. Table 3 reports the econometric evidence on the impact of standard hours on hourly wages for Germany. All four studies find wage compensation, although there is some variation in its degree.

Hunt (1999), the most cited empirical evidence on the effects of standard hours reductions in Germany, inspects the impact of different measures of overtime to calculate the hourly wage rate. She finds almost full wage compensation, with estimates of -0.78 for salaried employees and of -0.87 for hourly paid workers. Using industry-level data, Steiner & Peters (2000) obtain very similar estimates. Franz & Smolny (1994) find wage compensation for some industries (car industry, machinery and equipment, electrical equipment) and no effect for others. However, the authors point out that, for some industries, there were only few reductions in negotiated working time during the sample period, hence the insignificant coefficient on standard hours in these cases.

The findings of Hunt are confirmed with plant-level data from the IAB-Establishment Panel by Schank

¹³ See Feil & Schröder (2002) for an extensive survey or, for an early review, Seifert (1991).

¹⁴ It should be noted that Hunt uses industry-wide standard hours obtained from collective bargaining agreements, either as an instrument or, in separate regressions at the industry-level, as a right-hand-side variable. Since the latter delivers almost identical estimates, there is no evidence that Hunt's findings are flawed because of the endogeneity of her standard hours measure.

¹⁵ The finding of hardly any reaction in overtime hours is confirmed by most other studies, see Hunt (1999) or Schank (2003) for a review. The only noteworthy exception being the study by König & Pohlmeier (1989), who find that overtime hours fully adjust for the reduction in standard hours. Besides the usual caveat with time-series studies, it should be pointed out that their work is based on data before the working time reductions took place.

(2006). His results imply full income compensation for plants applying a bargaining agreement. This outcome does not depend on the level of collective bargaining (industry or firm level).¹⁶ Wages in plants without a bargaining agreement did also respond to changes in standard working time, but as expected to a smaller extent (with an elasticity of about -0.5). To summarize, the empirical evidence indicates that unions have achieved their goal of (near full) wage compensation, which was at the expense of new jobs for the unemployed.¹⁷

Due to wage responses summarized above, it is unlikely that the reduction in standard hours had a beneficial effect on employment in Germany. Direct econometric evidence on the impact of cuts in normal working time on employment is reported in Table 4. Most estimates are insignificant or very small. Only Dreger & Kolb (1999) find, on the basis of industry-level data, that the employment of the unskilled is negatively associated with reductions in standard hours. However, this may not be a causal relationship, but merely reflect that both series were moving simultaneously.

It should be noted that the first four studies listed in Table 4 all include the hourly wage as a right-hand side variable. Hence, their estimates measure the direct impact of standard hours on employment, holding wages constant. The papers by Hunt (1999) and Andrews et al. (2005) exclude the wage as an explanatory variable, so that their estimates of the standard hours elasticity control for any negative effect on employment via a rise in wages. Nevertheless, Hunt obtains an overall insignificant impact of normal working time on employment. Only in the case of a ten-industries sample, she obtains for men a positive and significant elasticity (implying that employment falls after a reduction in standard hours), although Hunt notes that "... the point estimates are too large to be plausible" (page 139).

Andrews et al. (2005) provide the only study using plant-level data. Apart from one exception, they do not find evidence of a positive work-sharing effect (and neither a detrimental effect on employment). The presence of unions has no impact, nor does the working-time regime (standard time vs. overtime companies) of the plant.¹⁸ The exception is the large pro-work-sharing effect in small plants (smaller than

¹⁶ This is in contrast to the hypothesis of Calmfors and Driffill (1988), who argue in their influential theoretical study that wage demands are more moderate by unions operating at the firm level as well as in an economy-wide bargaining framework, compared with industry-level bargaining.

¹⁷ The rise in unit labor cost can be mitigated by a rise in productivity. Some indirect evidence is offered by Schank (2003). Based on the IAB-Establishment Panel, 1993-1999, he finds that output remains unaffected after within-plant changes in standard hours, which indeed suggests that the hourly productivity has increased considerably after a cut in standard hours.

¹⁸ A potential problem is that the used measure of standard hours is the respective plant's standard work week (excluding overtime). This may deviate from the collectively agreed standard hours and does therefore not measure an exogenous policy change.

100 employees) in the East, non-service sector. However, this represents only a small proportion of the German economy (seven percent of plants and five percent of employment).

To summarize, there is hardly any (econometric) evidence that cuts in standard hours have increased employment. However, unions have increased the utility of their (employed) members, whose income was only slightly reduced when their leisure went up. This result seems ironic; in Germany reductions in standard working time between the mid-eighties and the mid-nineties were mainly the result of union pressure, who publicly pushed for this policy in order to increase employment.

4. Making Working Time Flexible

Unions achieved their goal of reducing standard hours by conceding various flexible working time arrangements to employers. The introduction of “opening clauses” (*Öffnungsklauseln*), which are usually concluded at the industry level between trade unions and employers, allows companies to deviate under certain conditions and to a certain extent from collectively agreed standards on pay and working time (Bispinck 1997). With respect to the latter, opening clauses include

- (i) the possibility for a certain percentage of employees to work permanently longer than the collectively agreed working time¹⁹
- (ii) the introduction of working time corridors, which allows the companies to extend or to reduce its working time within certain limits. Such corridors have been agreed in the chemical industry (standard hours can be permanently determined between 35 and 40 hours), in the textile and clothing industry (yearly working time can be increased up to 156 hours), and the paper industry (standard working time of 38 hours can be reduced up to 2(3) hours and extended up to 3(2) hours in Western (Eastern) Germany). Based on the IAB-Establishment Panel, in 2004 only 6.4 percent of plants applying any bargaining agreement made use of the provision of working time corridors. However, since the application is positively correlated with plant size, these companies cover about 14 percent of the employees of the whole economy.
- (iii) a further working time reduction without wage compensation for a limited period of time.

¹⁹ In the metalworking industry, for example, the collective agreement allows 13 respectively 18 percent (depending on the region) of the workforce to deviate from the standard 35-hour week and work between 35 and 40 hours. In addition, in 2004 it was agreed that under certain conditions up to 50% of the employees of a firm could work up to 40 hours. The settlement also imposes that jobs must not be cut as a consequence of increasing the quote above 18% and that hours beyond 35 hours will be paid, but without an overtime premium.

These opening clauses are always linked to the aim of saving jobs and can be found, for example, in the following sectors: metalworking (from 35 (38) hours down to 30 (33) hours in Western (Eastern) Germany), steel (from 35 (37) to 30 (31) hours in Western (Eastern) Germany), printing (reduction of a max. of 5 hours from 35 (38) hours in Western (Eastern) Germany), private banking (from 39 to 31 hours) and insurances (from 38 to 30 hours). According to the IAB-Establishment Panel, in 2004 about 3.2 percent of plants applying any bargaining agreement cut their working time in order to save jobs. These companies employ about 5.3 percent of all workers in the economy.

In addition, the introduction of working-time accounts (*Arbeitszeitkonten*) has become increasingly popular. The basic idea behind working time accounts is the following. Over some specified period of time, an employee is allowed to work longer or shorter hours than (collectively) agreed and thereby collect working time credits or debits in an individual working time account, which are later compensated for by additional free time or work. Many collective agreements contain provisions for the introduction and application of working time accounts (Bispinck 1998), but the implementation is often left to agreements between employers and works councils. Working time accounts differ according to the limits on the maximal credit and debit hours²⁰ as well as according to the time interval in which these hours must be compensated.

Through working time accounts, companies can better adjust to fluctuations in product demand, and increase their productivity and competitiveness. In addition, firms can decrease costs associated to the existence of a potentially expensive overtime premium. Some argue that the existence of working time accounts increases the demand for labor, or at least stabilizes employment (Koch 2001), though there is no convincing econometric evidence. However, with respect to the employees' preferences, the use of working-time accounts are rather ambiguous. On the one hand, they provide more control over time which may improve job satisfaction and commitment. On the other hand, work pressure may rise due to the company's demand for flexibility (European Industrial Relations Observatory (EIRO), 1998).²¹

In 2004, working time accounts were implemented in 22 percent of all German plants. In these companies, on average 84 percent of the work-force were covered by working time accounts. 42 percent of workers

²⁰ There is a huge variation in the limits (according to bargaining agreements) between industries, but also within industries between the credit and debit hours, although the latter is generally lower. The construction industry, for example, allows for a max. credit of 150 hours and for a max. debit of 70 hours, while the wood and plastics industries set 60 credit and 30 debit hours.

²¹ This problem can obviously be reduced by a limit on the maximum working time credit.

have a working time account.²² In 2002, the maximum time span until which deviations from the standard work week had to be compensated is less than six months in almost 30 percent of all plants and less than one year in 40 percent of the companies. Another 30 percent respond that there is no maximum time span. Accordingly, arrangements with a (fixed) maximum time interval of more than one year are rare.

5. Increases in Working Time: A new development?

As discussed above, in some industries exist opening clauses from bargaining agreements which allow companies to set standard hours above the collectively agreed working time. Using such opening clauses, recent company-level agreements drew public attention. In 2004, the Siemens electronics group (35 to 40 hours) and the car-maker Daimler-Chrysler (35 to 39 hours for services staff) reached agreements allowing them to increase working time. In exchange, the management of Daimler-Chrysler declared job guarantees to their workers in Germany until 2012, while Siemens cancelled its plan to move 2,000 jobs from North Rhine-Westphalia to Hungary. In both cases, there was no pay increase involved, which effectively implies an hourly wage cut (EIRO, 2004).

In May 2005, the Continental AG, Hannover, increased weekly working time from 37.5 to 40 hours without pay compensation in exchange for a commitment on the side of the company to produce at least 1.3 million tyres in Stöcken. Despite this employment pact, the company announced in November 2005 that it would close down its production site in Hannover-Stöcken and cut 320 jobs. In 2005, the Deutsche Bahn AG increased standard hours from 38 to 39 with pay increase. While Deutsche Telekom AG reduced its standard working time from 38 to 34 hours, it is believed that a number of other larger companies currently consider to increase their working time (EIRO, 2004). Increasing working time without wage compensation is probably (for employees) a less painful measure when a firm attempts to control labor costs than cutting jobs or reducing bonuses.

From the 12,400 non-public plants which answered the question in the IAB-Establishment Panel 2004, 328 (174) responded that they had increased (decreased) standard hours over the last twelve months (see Table 5). Monthly wages remained constant – i.e. hourly wages fell approximately by the same percentage as the increase in standard hours – in two thirds of the plants which increased standard hours. Only one out of five plants had fully compensated its employees – i.e. hourly wages did not change – for the

²² Own calculations with the IAB Establishment Panel. The share of workers is larger than the share of plants since the incidence of working time accounts rises with plant size.

extended working time. Similarly, hourly wages remained constant in nearly 60 percent of the plants which decreased standard hours. Only one quarter of plants with reduced standard hours provided full wage compensation for the workforce (i.e. monthly income remained constant).

While extensions of standard working time are a contentious topic in the public debate in Germany, the numbers indicate that at the company level we still observe reductions in standard hours. In fact, weighted numbers from the IAB-Establishment Panel show that between 2002 and 2004 10.2 (11.0) percent of Western German plants decreased their standard hours, whereas 16.5 (8.0) of the plants extended their working time.²³

Table 5 also reports employment growth between 2003 and 2004 for each plant-type. For plants extending their working time, the growth rates do not differ between full and no wage adjustment. Since wage costs are effectively reduced for the latter group, we could have expected a positive impact on employment. However, sample selection and the small size of the sample make the conclusion difficult to draw. We will have a closer look at the relationship between extension of standard hours and employment growth in the next section.

6. Job Stability through Increases in Standard Hours?

In this section, we report regression estimates of a change in standard hours between 2004 and 2002 on the growth in employment and on the growth in value added per employee over the same period. This is one of the first attempts to evaluate the effects of agreements on increasing standard hours like those at Daimler and Siemens reported above.

In contrast to the last section (see also Table 5), changes in standard hours are not identified by direct responses of the plant owners, but by comparing standard hours in 2004 with those reported for 2002. Hence, the sample of changers gets larger (since there are two years between), but there is no direct information on whether this was accompanied by full or none wage compensation.

We focus on the non-public sector only. To avoid the results being influenced by outliers, we have dropped plants with an employment growth of more than 100 percent and (in the regressions explaining value added) plants with a growth in value added per employee of more than 100 percent. In addition,

²³ These figures are higher than those implied by the absolute numbers listed in the previous paragraph since they refer to a two-year period and they are weighted.

plants which changed their working time by more than 10 hours and companies which reported a standard work week below 28 or above 48 hours were not included.

Before discussing the regression results of the employment and productivity growth equations, it will be interesting to have a look at the characteristics of those plants which have changed their standard hours between 2004 and 2002. Tables 6a and 6b report the results of a multinomial logit estimation on decreasing versus constant versus increasing standard hours. This complements the findings of Table 2 (Section 2), where we have investigated the relationship between the actual change in standard hours and the transition between bargaining regimes. Similar to the regressions of the actual change in standard hours, the multinomial logit equation is not well determined by observable plant-level characteristics.²⁴

Since the numbers reported in Tables 6a and 6b are marginal effects, each row sums to zero by construction. We should note that several variables differ in their impact between Western and Eastern Germany. Plants with a larger past employment growth have a higher probability of decreasing (increasing) standard hours in Western (Eastern) Germany. As expected, it is less likely that standard hours have been decreased between 2002 and 2004, if the plant worked overtime in 2002. Surprisingly, in Western Germany the performance of overtime reduces the probability of an increase in normal hours by five percent. In Eastern Germany only, the existence of a works council makes it more likely that standard hours are reduced. As has been expected, investment in ICT-technology is negatively related with a subsequent reduction in hours, while it has absolutely no impact on the probability of increasing normal working time.

In Western Germany, small plants have a higher probability to change standard hours in either direction, which is not the case in Eastern Germany.

Employment regressions are run for all workers and also for separate subgroups. For the latter, the dependent variable is computed by the change in employment (in the respective subgroup) divided by total employment in 2002.²⁵ We allow for separate effects of reducing and extending standard hours. Besides standard working time, the following right-hand-side variables are included: employment growth between 2002 and 2000, value added per employee in 2002, a dummy indicating whether or not overtime existed in 2002²⁶, the export share within total sales, the profit situation in 2002, existence of a works council in

²⁴ The Pseudo- R^2 amounts to 0.424 (0.296) in Western (Eastern) Germany.

²⁵ Genuine growth rates for the subgroups would provide lots of missing values due to a zero in the denominator.

²⁶ Unfortunately, a dummy variable is the only information on overtime work. Hence, we could not fully control for a potential substitution of standard hours for overtime hours.

2002, a dummy for investment in ICT in 2002, , dummies for plant age, bargaining dummies, firm size and sectoral dummies.²⁷

Table 7 reports the parameter estimates on the change in standard hours. The main results are as follows:

1. There is a negative relationship between total employment growth and increasing standard hours. C.P., a rise in working time by 1 hour is associated with a shrinkage in employment by 1 (1.7) percent in Western (Eastern) Germany.
2. By contrast, decreasing standard hours does not affect employment growth.
3. For Western Germany, the growth in value added rises when hours are increased, although the estimate is not significant, and is virtually unchanged when hours decrease. However, in this case we expect substantial measurement error in the dependent variable which –as is well-known– becomes more important when using changes over time (as in our context).²⁸
4. For Eastern Germany, decreasing standard hours are associated with a fall in value added per employee.
5. The effects on different skill categories are not uniform, but are in most cases insignificant. For Western Germany, the negative relationship between extending normal working time and employment growth discussed above is found for the skilled blue-collar workers.
6. For Western Germany (only), there is a negative relationship between extending standard hours and part-time employment. This is what standard economic theory predicts (since labor costs of a full-time worker fall). However, the share of part-time workers is also negatively associated with decreasing standard hours (both, for Western and Eastern Germany). As reported above, total employment remains unaffected after a cut in standard hours, which suggests a substitution from part-time to full-time employment.²⁹
7. The parameter estimates on other fringe-workers (temporary and subcontracted employees) are in most cases insignificant. Nevertheless, they are negatively related with increasing and also (in all but one case) with decreasing standard hours.
8. The rate of female workers is totally unaffected by a change in hours.

These findings should be taken with some caveat. We have conditioned the impact of changing standard

²⁷ These variables are equivalent to those included in the multinomial logit regression.

²⁸ In particular, the reported percentage share of total sales represented by material costs (which is used to compute our measure of value added) is believed to be an “informed guesstimate”. This is reassured by the fact that two third of the observations (on material costs) are multiples of 5 percent.

²⁹ This may arise because some employees switch from part-time to full-time status, but obviously one cannot identify with plant-level data whether the observed effect is due to within or between-worker substitution.

hours on employment (and productivity) growth on a battery of variables from 2002 and the employment growth between 2002 and 2000, in order to control for differences between plants which increase (decrease) standard hours and those which do not. Nevertheless, there may still be unobserved factors which influence the propensity to increase/decrease standard hours and simultaneously employment growth. We leave it for future research to control for this endogeneity problem.

One should also keep in mind that the results are based on a relative small number of plants changing their standard hours (see first column in Table 7). Furthermore, we have only looked at the contemporaneous relationship between standard hours and employment while future waves of the IAB panel will allow us to investigate whether changes in standard hours between 2002 and 2004 have different long-run employment effects than those reported above. Finally, the impact of a rise in standard hours on employment depends on whether or not the monthly wage remains constant or whether it is adjusted accordingly (see also the theory chapter). Linking the IAB-Establishment Panel to the employment statistics register (*Beschäftigtenstatistik*) will provide (precise) information on the development of employees' wages at the individual level. This will allow us to condition the relationship between standard hours and employment on whether or not wages have been adjusted accordingly.

Subject to the caveats discussed above, the preliminary results of the empirical exercise undertaken in this section are rather pessimistic. They do not offer evidence in favor of the claim that job stability rises through increases in standard hours (and thereby lowering costs), but rather suggest the opposite.

7. Conclusions

This chapter has focused on working time developments in Germany, where standard hours have been reduced between the mid-eighties and the mid-nineties in order to increase employment. However, econometric studies have found no evidence that work-sharing boosts employment in Germany. Rather, unions have achieved their goal of (near) full wage compensation. In other words, unions sacrificed their postulated goal -namely new jobs for the unemployed - to secure a higher utility for those employed (whose income does not change when their leisure increases).

While aggregated standard hours remained stable during the last ten years in Western Germany or fell only slightly in the East, we observe considerable between and within-plant variation in working time. This is due to the introduction of opening clauses, which allow companies to deviate under certain

conditions from collectively agreed standard hours. Also, 30 (45) of the employees in Western (Eastern) Germany work under individual regulation and standard hours are highest in these plants. We have found evidence that plants leave industry-wide agreements to increase standard working time (the coefficient estimate implies a difference-in-difference of 33 minutes for Western Germany, as compared to those which keep their industry-wide agreements).

The company-level agreements of Siemens and Daimler Chrysler in 2004 are two noteworthy examples of rising standard hours to cut unit labor costs. The number of plants which followed is still small and whether increases in standard hours should be a general strategy to stabilize (or even increase) employment is a contentious topic at the moment in Germany. Our preliminary regression results show a negative relationship between an increase in standard hours and employment. *Ceteris paribus*, a rise in working time by 1 hour is associated with decreasing employment by 1.0 (1.7) percent in Western (Eastern) Germany. Essentially, part-time workers are replaced by (less) full-time employees. More general (causal) conclusions are hard to draw, in particular when one recalls that decreasing or increasing standard hours is mostly found in small or very small firms in Western Germany.

Box 1: The IAB-Establishment Panel

The German data we use are from the IAB-Establishment Panel Data Set collected by the Institut für Arbeitsmarkt- und Berufsforschung (IAB), Nuremberg, Germany.³⁰ This yearly survey has been conducted since 1993 in Western Germany, and since 1996 in Eastern Germany. Information is obtained by personal questioning carried out by Infratest Sozialforschung, Munich, with voluntary participation by plants managers. Altogether, the (unbalanced) IAB panel comprises between 1993 and 2004 126,381 observations and 35,509 plants. Detailed descriptions of the IAB-Establishment panel can be found in Kölling (2000).

The sample is drawn from the employment statistics register of the German Federal Office of Labour, which covers all plants with at least one employee (or trainee) subject to social security.³¹ All plants included in the population (i.e. all plants included in the employment statistics register---are stratified into 400 cells, which are defined over 10 plant sizes, 20 industries and two regions (Western vs. Eastern Germany), from each of which the observations of the establishment panel are drawn randomly. Large plants are over-represented in the IAB panel. In the first wave (1993), for example, the probability of being drawn was on average 91 percent for plants employing more than 5,000 employees, but only 3 percent for plants employing between 100 and 200 employees and as small as 0.1 percent for plants with less than 5 employees. The over sampling of large plants implies that the survey covers about 0.8 percent of all plants in Germany, but 8 percent of all employees.³²

Interviewers ask about 80 questions each year on topics including: detailed information on the decomposition of the work-force (gender, skill, blue-collar vs. white-collar, part-time employees, apprentices, civil servants, owners) and its development through time; business activities (total sales, input materials, investment, exports, profit situation, expectations, whether plant does R&D, product and process innovations, organizational changes, technology of machinery, adopted plant policies/strategies); training and further education; wages; lots of information on working time (standard working time, overtime, percentage of employees working overtime, percentages of employees working on Saturdays, working on Sundays, working on shifts, and working with a flexible working time schedule); and general information about the plant (whether plant is subunit of a firm, ownership, birth year, existence of works

30. The IAB (in English Institute for employment Research) is the research institute of the Federal Employment Services in Germany.

31. For 1995, the employment statistics cover about 79 percent of all employed persons in Western Germany and about 86 percent in Eastern Germany, (Bender, Haas and Klose, 2000).

32. Population weights, which are the inverse of the sample selection probabilities, are available for empirical analysis.

council, whether plant applies bargaining agreement, whether plant has been merged with or split from another plant in the last year, three-digit industry affiliation, region). While most questions are asked yearly (or on a two-year/ three-year basis), some topics have been surveyed only once.³³

Information on weekly standard working time is available for all years except 1994, 2000 and 2003. Unfortunately, a reliable (time-series) measure of actual hours worked cannot be constructed since quantitative information on the overtime volume is only available in some years. Furthermore, the question asked changes through time and there has been considerable non-response on this item. There is no usable information on different bargaining regimes before 1995. Therefore, this study uses observations of the years 1995-2004, excluding 2000 and 2003.

33. For example, the question on whether or not changes in standard hours were accompanied by adjustments in the monthly wage was only asked in 2004.

Table 1: Distribution of standard working time at the company level, 2004

	<i>Western Germany</i>	<i>Eastern Germany</i>
Average weekly working hours:	38.39	39.62
% of employees working:		
below 35 hours	1.5	0.9
35 hours	10.4	1.3
36-37 hours	4.9	3.4
37.5-38.5	44.5	13.2
39-39.5	9.0	7.8
40 hours	24.7	69.0
above 40 hours	4.7	4.4

Source: IAB-Establishment Panel. Employment-weighted.

Table 2: Standard Hours and Bargaining Agreements:
Dependent Variable: Changes in Standard Hours
OLS Regression Estimates^{a-c}

	<i>Unweighted</i>		<i>Weighted^d</i>		<i>No of obs:</i> <i>Western/</i> <i>Eastern</i>
	Western	Eastern	Western	Eastern	
Bargaining agreements in $t-1$ and t					
None $_{t-1}$ * None $_t$	Reference		Reference		5,406/ 7,451
None $_{t-1}$ * Industry Level $_t$	-0.028 [-0.49]	-0.004 [-0.06]	-0.043 [0.38]	-0.082 [-0.98]	722/ 460
None $_{t-1}$ * Firm Level $_t$	0.010 [0.08]	-0.022 [-0.23]	0.044 [0.34]	0.031 [0.31]	135/ 229
Industry Level $_{t-1}$ * None $_t$	0.311 [5.91]	0.213 [3.77]	0.499 [4.52]	0.232 [3.28]	900/ 722
Industry Level $_{t-1}$ * Industry Level $_t$	-0.039 [-1.48]	-0.005 [-0.16]	-0.045 [-1.41]	-0.004 [-0.10]	11,704/ 4,028
Industry Level $_{t-1}$ * Firm Level $_t$	0.070 [0.71]	-0.042 [-0.40]	0.040 [0.51]	-0.021 [-0.28]	237/ 198
Firm Level $_{t-1}$ * None $_t$	0.203 [2.27]	0.016 [0.25]	0.109 [0.98]	0.175 [1.29]	283/ 581
Firm Level $_{t-1}$ * Industry Level $_t$	-0.029 [-0.34]	0.009 [0.10]	-0.046 [-0.56]	0.013 [0.21]	312/ 247
Firm Level $_{t-1}$ * Firm Level $_t$	-0.007 [-0.11]	0.018 [0.30]	-0.041 [-0.46]	0.087 [1.79]	777/ 720
Works Council (Dummy: 1 = yes)	-0.032 [-1.35]	-0.040 [-1.25]	-0.038 [-1.80]	-0.071 [-2.26]	
R^2	0.007	0.004	0.011	0.006	
No of. Observations					
Total	20,476	14,636	20,342	14,445	
Changes in working time	5,637	2,542			

^a t-values in brackets. 1996(1997)-2004, but excluding 2000 and 2003, for Western (Eastern) Germany, IAB-Establishment Panel. Changes in standard hours in 2004 and 2001 refer to a two-year difference. For consistency, in these years the bargaining dummies refer to t and $t-2$.

^b Not included are: (i) the public sector (ii) observations with a change in the bargaining regime between t and t+1 (iii) observations where the change in working time exceeded ten hours (iv) observations where the reported standard hours were below 28 or above 60.

^c Regressions also include year dummies. Dummies for firm size respectively industry were jointly insignificant.

^d Weights are constructed by multiplying the appropriate survey sample weight by employment.

Table 3: Econometric Evidence from Germany on the impact of standard hours on hourly wages

<i>Study</i>	<i>Data</i>	<i>Methodology</i>	<i>Independent Variables</i>	<i>Standard Hours Elasticity of Hourly Wages</i>
Franz & Smolny (1994)	aggregate economy and seven industries; 1970-1989; quarterly	Error Correction Model	Standard hours, employment, overtime and short-time working rates, unemployment rate, labour productivity	[-0.51, 0.00] ^a
Steiner & Peters (2000)	27 manufacturing industries, 1979-1995	wage equations for three skill groups; SUR estimation; dependent variable: change in wages	changes in (bargained) standard hours and its lag, unemployment rate, industry dummies	Unskilled: -0.66 Medium Skilled: -0.66 Highly Skilled: -0.85
Hunt (1999)	Full-time employees; 20,009 observations, 5,995 individuals; 1986, 1988-94; GSOEP	Fixed Effects; separately for hourly paid workers and salaried employees and for manufacturing and services	standard hours, year, industry, firm size dummies	[-0.95, -0.78]
Schank (2006)	21,941 observations and 7,166 plants; 1995-1999; Western and Eastern Germany	OLS, Two-Step Lee, Fixed Effects, IV; separate regressions for plants with no/industry-level/firm-level agreements	standard hours; controls for employment structure and working time organization; dummies for firm size, sector	~[-1, -.5] ^b

^a Significant only for three industries.

^b Full wage compensation for plants with a bargaining agreement; income sharing for plants without a bargaining agreement.

Table 4: Econometric Evidence from Germany on the impact of standard hours on employment

<i>Study</i>	<i>Data</i>	<i>Methodology</i>	<i>Independent Variables</i>	<i>Standard Hours Elasticity of Employment</i>
König & Pohlmeier (1989)	Manufacturing (aggregated), quarterly, 1964-1983	System of factor demand for N, H, K; factor costs are proxied by marginal prices of cost function; SUR & FIML estimation	standard hours, hourly wage, non-wage labor costs, capital costs, output, time trend	[0.05, 0.08]
Hunt (1999)	30 manufacturing industries, 1982-1993	Fixed Effects (employment weighted); standard hours instrumented	(bargained) standard hours and its lag, year dummies, industry dummies, industry trends	-0.49 ^a
Dreger & Kolb (1998)	33 manufacturing industries, 1960-1994	Random Effects	(bargained) standard hours, value added, hourly wage	0.231 ^a
Dreger & Kolb (1999)	32 manufacturing industries, 1975-1990	Fixed Effects; separate for different skill levels	(bargained) standard hours, value added, hourly wage	Unskilled: 1.035 Medium Skilled: -0.473 ^d Highly Skilled: 0.484 ^a
Steiner & Peters (2000)	27 manufacturing industries, 1978-1995	Leontief system of labour demand for three skill groups; estimation in differences by SUR	(bargained) standard hours, hourly wage, capital, value added, time trend	Insignificant for all skill groups ^b

Andrews, Schank, and Simmons (2005)	18,596 observations and 5,136 plants; 1993-1999; Western and Eastern Germany	First Differences	standard hours, investment (not differenced), bargaining dummy, demand shock, controls for employment structure and working time organization	All: -0.062 ^{a, c} East production: -0.754
-------------------------------------	--	-------------------	---	--

^a Insignificant.

^b Elasticities cannot be calculated from the coefficients reported in the study, since sample means are not given.

^c Elasticity remains insignificant when stratifying between overt-time and standard-time plants and when. Similarly, no evidence that the presence of unions favor work-sharing.

^d Significant only at the 10 percent level.

Table 5: Adjustment in monthly wages after changes in standard hours

Number of observations and employment growth

	No infor- mation	Monthly Wage Adjustment			Total
		Fully	Partly	None	
Change in standard hours					
None	n.a.	n.a.	n.a.	n.a.	11,898 (-0.011)
Extension	8	83 (-0.024)	52 (0.010)	187 (-0.026)	328 (-0.018)
Reduction	3	94 (-0.019)	28 (-0.001)	49 (-0.015)	174 (-0.015)

^a IAB Establishment-Panel, 2004.

Table 6a: Multinomial logit estimates of the probability of a change in standard hours between 2002 and 2004. Marginal effects. Western Germany ^a

	Decreasing Standard Hours		Constant Standard Hours		Increasing Standard Hours	
	Coeff.	t-val.	Coeff.	t-val.	Coeff.	t-val.
Employment growth between 2000 and 2002	0.034	[2.11]	-0.010	[-0.36]	-0.024	[-0.95]
Information from 2002:						
Existence of overtime	-0.019	[-1.13]	0.074	[3.00]	-0.054	[-2.65]
Value added per employee	-2.1e-4	[-1.91]	2.4e-4	[1.90]	-2.2e-5	[-0.26]
Export share in total sales	0.006	[0.13]	0.022	[0.36]	-0.027	[-0.53]
Existence of a works council	0.014	[0.57]	0.006	[0.18]	-0.020	[-0.78]
Profit situation (dummy; 1=very good/good)	0.008	[0.52]	-0.012	[-0.54]	0.004	[0.21]
Investment in ICT (dummy)	-0.025	[-1.62]	0.026	[1.20]	-0.001	[-0.03]
Plant born before 1990 (dummy)	-0.038	[-1.92]	0.043	[1.40]	-0.005	[-0.20]
Plant born between 1990 and 1995 (dummy)	0.017	[0.85]	-0.044	[-1.55]	0.027	[1.21]
Plant applies industry level agreement	0.023	[1.43]	-0.024	[-1.05]	0.001	[0.07]
Plant applies firm level agreement	0.039	[0.89]	-0.081	[-1.45]	0.042	[0.87]
Plant size (N) dummies:						
5<=N<=9	-0.028	[-1.47]	0.083	[2.88]	-0.056	[-2.55]
10<=N<=19	-0.064	[-3.91]	0.138	[5.14]	-0.074	[-3.50]
20<=N<=49	-0.086	[-5.31]	0.123	[4.28]	-0.037	[-1.55]
49<=N<=199	-0.090	[-4.90]	0.147	[4.58]	-0.057	[-2.12]
199<=N<=499	-0.074	[-3.48]	0.173	[5.06]	-0.099	[-3.65]
500<=N	-0.088	[-4.56]	0.193	[5.61]	-0.104	[-3.66]
No. of observations	295		1,532		394	

^a Regression also include sectoral dummies. Base category: no works council, profit situation below good, plant born after 1995, no bargaining agreement, plant size below 5 employees.

Table 6b: Multinomial logit estimates of the probability of a change in the standard hours between 2002 and 2004. Marginal effects. Eastern Germany. ^a

	Decreasing Standard Hours		Constant Standard Hours		Increasing Standard Hours	
	Coeff	t-val.	Coeff.	t-val.	Coeff.	t-val.
Employment growth between 2000 and 2002	0.002	[0.16]	-0.014	[-1.09]	0.012	[1.69]
Information from 2002:						
Existence of overtime	-0.040	[-2.73]	0.045	[2.40]	-0.005	[-0.37]
Value added per employee	8.9e-5	[1.33]	-1.4e-4	[-1.31]	4.9e-5	[0.64]
Export share in total sales	-0.014	[-0.26]	0.081	[1.06]	-0.068	[-1.09]
Existence of a works council	0.055	[2.08]	-0.062	[-1.91]	0.007	[0.33]
Profit situation (dummy; 1=very good/good)	0.013	[0.98]	0.008	[0.47]	-0.021	[-1.78]
Investment in ICT (dummy)	-0.027	[-2.15]	0.026	[1.54]	0.001	[0.06]
Plant born before 1990 (dummy)	0.010	[0.64]	-0.033	[-1.61]	0.023	[1.63]
Plant born between 1990 and 1995 (dummy)	0.053	[2.34]	-0.065	[-2.33]	0.012	[0.65]
Plant applies industry level agreement	-0.015	[-1.16]	-0.009	[-0.47]	0.024	[1.55]
Plant applies firm level agreement	-0.007	[-0.38]	0.008	[0.29]	-0.001	[-0.04]
Plant size (N) dummies:	0.033	[1.53]	-0.027	[-1.06]	-0.006	[-0.41]
5<=N<=9	-0.003	[-0.17]	0.032	[1.32]	-0.029	[-2.02]
10<=N<=19	0.052	[1.91]	-0.037	[-1.22]	-0.015	[-0.90]
20<=N<=49	0.054	[1.60]	-0.045	[-1.20]	-0.009	[-0.43]
49<=N<=199	0.038	[0.82]	-0.012	[-0.24]	-0.025	[-1.06]
199<=N<=499	-0.014	[-0.22]	0.003	[0.04]	0.010	[0.17]
500<=N	0.002	[0.16]	-0.014	[-1.09]	0.012	[1.69]
No. of observations	162		1,669		153	

^a See Table 6a, Tabellenote a.

Table 7: OLS-estimations of growth in employment and value added per employee.

Parameter estimates on the change in standard hours between 2004 and 2002. Private companies^{a-c}

Dependent variable:	Rate of employment change between 2004 and 2002 ^d										Growth in Value Added per Employee between 2004 and 2002
	Total ^e	Un-skilled Blue-Collar	Un-skilled White-Collar	Skilled Blue-Collar	Skilled White-Collar	Part-time Workers ^f	Females ^f	Temporary Workers ^f	Subcontracted Workers ^g		
Western Germany											
Increase in standard hours (obs= 394/ 313)	-0.010 [1.95]	-0.003 [0.64]	0.001 [0.23]	-0.012 [2.12]	0.005 [0.82]	-0.010 [2.04]	-0.002 [0.46]	-0.001 [0.67]	-0.005 [1.02]	0.285 [1.17]	
Decrease in standard hours (obs = 295/ 225)	-0.002 [0.23]	-0.011 [1.34]	0.005 [1.42]	0.005 [1.01]	0.001 [0.25]	0.008 [1.18]	-0.000 [0.04]	0.005 [1.34]	0.006 [1.32]	-0.047 [1.18]	
Eastern Germany											
Increase in standard hours (obs = 153/ 124)	-0.017 [1.88]	0.002 [0.27]	-0.002 [0.30]	-0.009 [0.82]	-0.009 [1.05]	-0.006 [0.59]	-0.006 [0.58]	-0.003 [0.47]	-0.000 [0.02]	0.007 [0.13]	
Decrease in standard hours (obs = 162/ 122)	0.003 [0.44]	-0.001 [0.15]	0.002 [1.07]	0.005 [0.57]	-0.004 [0.43]	0.012 [1.86]	0.001 [0.24]	-0.004 [1.10]	0.008 [1.83]	0.096 [2.76]	

^a Source: IAB-Establishment Panel. Excluded are plants which reported a standard work week of more than 48 or less than 28 hours and plants which reported a change of more than 10 hours between 2004 and 2002.

^b 2,221 (1,977) observations for Western (Eastern) Germany in the employment regressions. 1,779 (1,674) observations for Western (Eastern) Germany in the value added regressions. Lower sample size in the value added regressions due to missing values. t-values in brackets. Further independent variables equivalent to those reported in Tables 6a/ 6b.

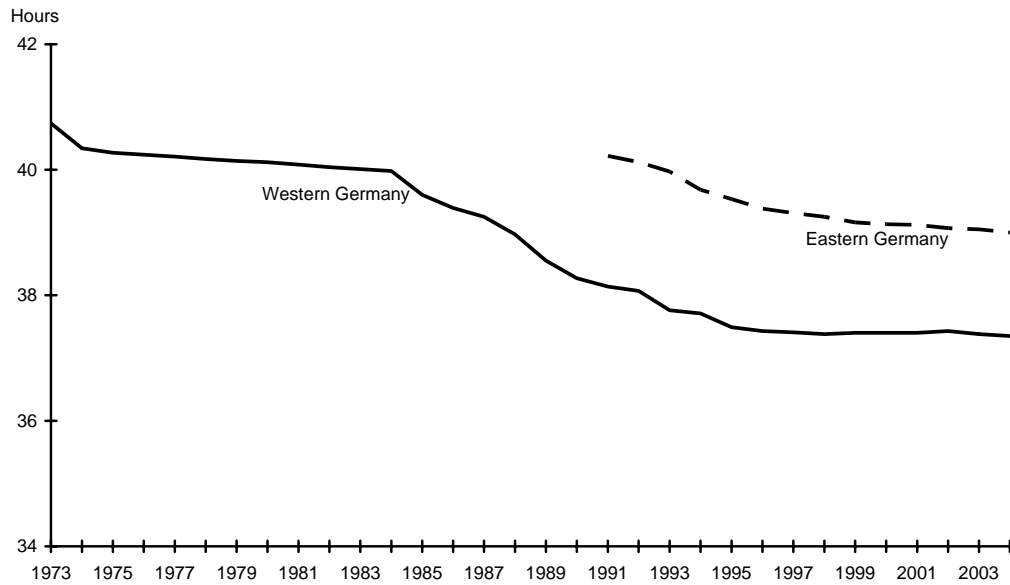
^d Measures are computed as the change in employment in the respective subgroup divided by the plant's total employment in 2002.

^e *Total* decomposes of the subgroups in the following four columns plus (unreported) managers/plant-owners.

^f Part-timers, females and temporary workers are contained in *Total* and are not mutually exclusive. Any part-timer, for example, is either skilled or unskilled and either a permanent or a temporary employee.

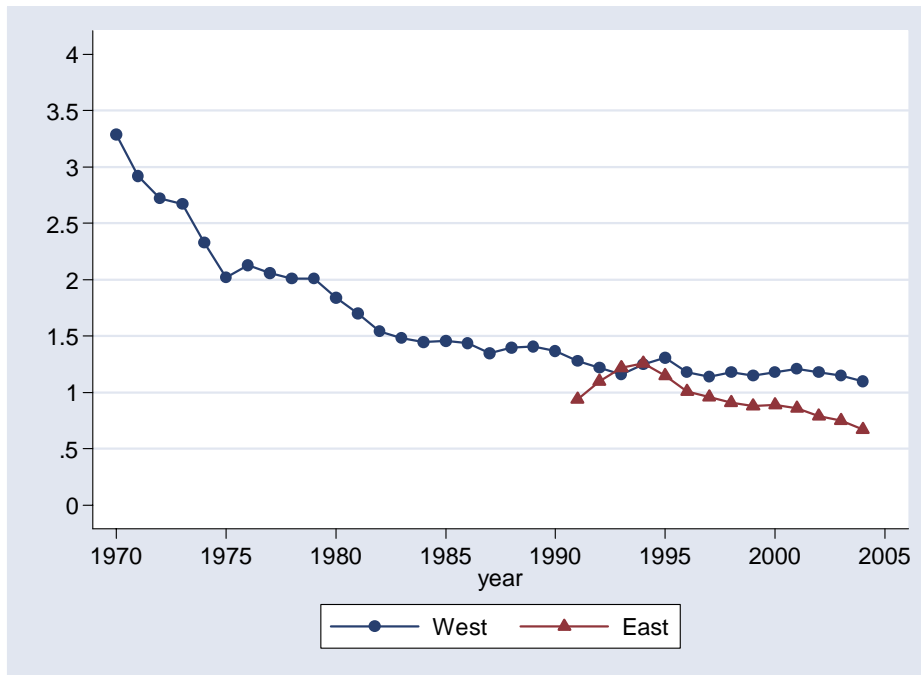
^g Subcontracted workers is in addition to total employment and are not contained in any of the other groups.

Figure 1: Standard Working Time determined by Collective Bargaining



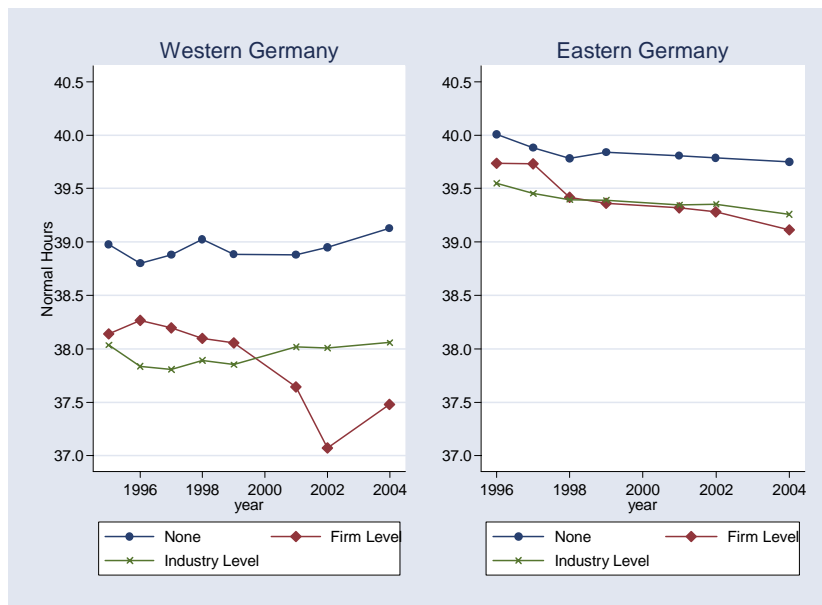
Source: Tarifregister of the BMWA

Figure 2: Development of Weekly Paid Overtime Hours



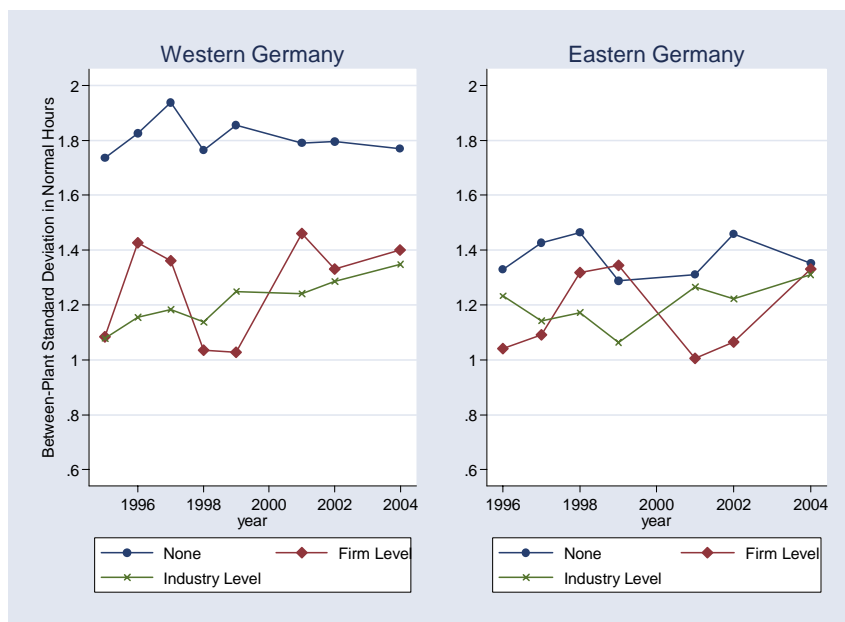
Source: IAB-Arbeitszeitrechnung

Figure 3: Standard Working Time at the Company Level^a



^a Source: IAB-Establishment Panel.
Weighted Statistics (weights are constructed by multiplying the survey weights by employment).

Figure 4: Between-Plant Dispersion in Standard Working Time^a; Normalized^b



^a Source: IAB-Establishment Panel.
Weighted statistics (weights are constructed by multiplying the survey weights by employment).
^b Industry and plant size effects have been removed.

Chapter 3: The Two French Work-Sharing Experiments: Employment and Productivity Effects

1. Introduction

The idea that sharing work might create employment was always popular among a fraction of the French population. In the face of a very high unemployment rate, any simple solution with apparently little impact for those holding a job looks attractive. The simple-minded recipe of work-sharing, Malthusian in spirit, has a long history in France (for instance, pre-retirement programs were massive in the eighties). This type of solution was always accepted by the French population (no union complained when pre-retirement programs were implemented). But the underlying mechanisms of these restrictive policies are not always well understood. In particular, we will show that they are completely at odds with the popular belief: work-sharing policies by themselves do not allow employment to be shared as long as the profitability conditions of firms are not preserved (see the theory chapter); however, work-sharing associated with large wage subsidies increase employment, at least in the very short run (again, see the theory chapter); however, these types of policy tend to redistribute market shares across firms with different productivity levels, and affect firms' probability of death.

Because the consequences of workweek reductions are complex, partly unpredictable, and, as we will see, with sizeable unintended consequences, it seems fair to say that the French acted as sorcerers' apprentices when experimenting two workweek reductions. In this chapter, we describe these experiments. We first show, using the 1982 workweek reduction that work-sharing policies, per se, do not work. Put differently, they are not susceptible to work as long as wage subsidies are not offered to the firms. Then, we show, using the end of the nineties experiment, their impact on employment as well as on productivity. We will show how payroll tax subsidies (as well as other types of subsidies) mitigated the negative effects on employment of this last experiment. In the short-run, firms that went to 35 hours benefited from the policy, in particular the low-productivity firms (because payroll tax subsidies were disproportionately directed to them) to the detriment of firms that stayed at 39 hours. Hence, in the short-run, employment was redirected to the low-productivity firms adopting the policy. Then, in the medium run, the breath of air coming from the subsidies stopped acting and the firms that went to 35 hours started to die massively, when the survivors appear to have benefited from these deaths. To be honest though, it is difficult to identify the role of the 35 hours policy on the death of these firms. Those firms that died might have died anyway.

Work-sharing policies cannot be assessed by examination of each firm in isolation; the reshuffling, with the associated deaths and successes, entailed by such a massive shock is a first-order element to understand when thinking about these policies. But, this is not the final word on work-sharing in France: we do not understand yet the various aspects that this policy had on French firms.

2. Institutional Context

2.1. Principles and Legal Aspects of the 1982 Reduction of the Workweek

2.1.1. Changes in Hours

The number of hours worked strongly decreased during the seventies, from 48 hours in 1974 to just above 40 hours in 1981. During all this period, indeed since 1936, the standard workweek was 40 hours. François Mitterrand's election in May 1981 induced a sudden decrease of the standard to 39 hours (January 16, 1982 ordinance). In fact, negotiations started just after May 1981, since the reduction was part of the left's electoral platform. These negotiations were should have ended before 1982. In a report to the President at the end of 1981, the Prime Minister mentions that negotiations did not make real advances but nevertheless recommends letting firms' and workers' unions and delegates continue until the second quarter of 1982, the suggested date of application of the new standard. Against his Prime Minister's recommendations, François Mitterrand imposed, by the January 16 ordinance, the new 39 hours standard, which took effect February 1, 1982. Collective agreements, specifying the terms of application of the decree, ensued, starting with the largest firms in the manufacturing industries and spreading to smaller firms and other industries (Marchand, Rault, and Turpin, 1983).

Therefore, the law reducing the workweek became effective February 1, 1982. It mandated a maximum legal workweek of 39 hours, whereas it was 40 hours previously, and only slightly altered the prevailing regulation on overtime: the overtime premium remained 25% for the first four hours, and 50% above, but the maximum compensated hours was reduced from 50 to 48 per week (for more details see Marchand, Rault, and Turpin, 1983).

2.1.2. The Mandatory Nominal Wage Rigidity and its Consequences

The government also recommended that monthly pay after the change in workweek remain unchanged for all workers, but no special arrangements were included in the law to enforce this recommendation except for workers paid the legal minimum wage (SMIC) and working 40 hours. For these workers, a special

hourly minimum wage was prescribed in order to guarantee that their monthly earnings be unchanged after the change in hours.¹ Hence, a worker paid the SMIC and working 40 hours before February 1, 1982 received the same monthly earnings after February 1st even though the workweek was only 39 hours. However, any worker hired at the minimum wage rate after February 1, 1982 received monthly pay corresponding to his or her exact number of hours. Therefore, newly hired workers were approximately 2.5% (100 Francs a month or \$20 US) cheaper than their more senior counterparts because of this special provision in the hours-reduction law. Furthermore, since a 5% increase in the hourly SMIC was one of the first decisions made by the newly elected government in mid-1981, the hourly cost of minimum wage workers increased by 7.5% between mid-1981 and mid-1982. Finally, for all other categories of workers, the “recommendation” to leave monthly pay unchanged seems to have been followed by most firms. A survey conducted in September 1982 showed that more than 90% of all workers had their monthly pay unchanged after implementation of the law reducing the length of the workweek (Marchand, Rault, and Turpin, 1983).

2.2. Principles and Legal Aspects of the Nineties Reductions of the Workweek

Three legislative frameworks have directed workweek reduction (to 35 hours). Whereas the first two, the Robien law enacted in June 1996 and the Aubry I, enacted in January 1998, were essentially giving establishments incentives to reduce hours, the Aubry II law, enacted in January 2000, reduced the legal workweek in all establishments with more than 20 employees. Massive subsidies were an essential element of all the Laws we describe now.

For the last two laws, we present the main changes that they involved.

The June 13, 1998 Law (so-called Aubry I).

As the Robien laws, the Aubry I laws gave establishments incentives to reduce their workweek and create or preserve employment in exchange for large subsidies. In order to receive these subsidies, firms had to reduce hours by at least 10% in order to attain an average weekly duration of 35 hours. In such a case, employment creation had to amount to 6% of total employment (against 10% for Robien laws). A “defensive” aspect also allowed firms to receive subsidies to avoid economic separations or collective dismissals (plan social, see Kramarz and Michaud for a description of the institutions).

¹ The minimum wage legislation in France specifies an hourly wage.

Subsidies are given for every employee that sees her hours of work decrease as well as for new hires. The subsidies comprise employer-paid payroll tax subsidies for a period of 5 years starting at the date of the agreement. The subsidy is decreasing across time to push firms to sign agreements as fast as possible.

The exit from this subsidies system is provided by the Aubry II laws.

The January 19, 2000 Law (so-called Aubry II)

For all establishments with more than 20 employees, the Aubry II law added new employer-paid payroll tax subsidies. These subsidies comprised two components:

- A 4,000 French Francs per year and employee for firms at 35 hours.
- Payroll tax subsidies for low-wage and middle-wage workers. The subsidy is equal to 17,500 French Francs at the minimum wage and decreases up to 1.8 times the minimum wage.

Such subsidies are applied to firms receiving no other support when a majority agreement² was signed setting a 35 hours workweek or a 1600 hours work-year³ (together with employment clauses). In addition, some large government-owned firms were not eligible to receive such subsidies.

Finally, when firms stopped being eligible to incentive-subsidies, firms were entitled to receiving payroll-tax subsidies for the low- and middle-wage workers.

At the beginning of the 21st century, there are various types of firms with more than 20 employees :

- Firms at 39 hours, that must pay overtime.
- The so-called Robien firms that went to 35 hours before July 1998
- The so-called Aubry I (subsidized, offensive) that went to 35 hours between July 1998 and January 2000. On top of payroll tax subsidies, they receive incentives and structural “help”. They had to decrease working time by 10% and increase employment by 6%.
- The so-called “Aubry II forerunner” (précurseurs) that went to 35 hours before January 2000 without asking the system of subsidies. Hence, they did not have to increase employment nor decrease their working time by 10%. However, they receive the structural subsidies starting January 2000.

² An agreement is deemed “majority-rule” if it is signed by one or more unions that had received a majority of votes at previous work councils elections or if it was approved by a majority of workers. Firms with less than 50 employees may apply an extended collective bargaining agreement.

³ The 35 hours threshold was enough to receive subsidies without reducing hours by 10%. Some firms indeed set hours to 35 without reducing hours by 10%. To do this, they redefined working time by excluding various breaks or the sixth week of paid holidays, that were all included in the previous computation.

- The so-called Aubry II that went to 35 hours after January 2000. They receive the structural subsidies and do not have to create employment or decrease working time.
- Firms that reduce their working time without receiving subsidies, in particular because they decided not to ask them.

Table 1 presents summary statistics for these different firms (number and employment) for firms with variables without apparent measurement error. Clearly, those groups with the largest number of firms are the Aubry I, Aubry II précurseurs (forerunners), Aubry II, and those with no agreement. A small fraction of firms (2.4%) adopted the 35 hours workweek before July 1998. These were relatively large firms (7.6% of employment of firms above 20 employees). The Aubry I adopters went to 35 hours between July 1998 and December 1999. The largest fraction – with a job creation obligations – represent 18% of firms and 22% of workers. A much smaller fraction, the so-called defensive Aubry I, had an obligation of preserving job. Simultaneously, the Aubry II précurseurs (Aubry I, no subsidy in Table I) also went to 35 hours. Because they could redefine working time, they were a small fraction of firms, 4%, but they represented a large fraction of employment, 11%. Then, starting in January 2000, the Aubry II firms adopted the 35 hours workweek (15% of firms, 18% of employment). Finally, the largest group both in terms of number of firms, 47%, and in terms of employment, 28%, decided to refuse the new workweek. These relatively small firms pay overtime for every hour worked over 35.

As in 1982, the Aubry II law tried to guarantee stable monthly wages for all workers moving to the 35 hours workweek.⁴ Most importantly, this monthly wage guarantee affected the way the minimum wage was set and increased every July 1st. In particular, it induced a flurry of minimum wages. For instance, before recent changes (2005, when Raffarin was still prime minister), there were 6 different levels of minimum wages, depending on the moment a firm went to 35 hours and depending on the status on the worker (new hire on a new job or not). The differences in compensation could be huge. However, in 2005 all minimum wages converged to a unique minimum set at the highest hourly level among the various prevalent minima. However, payroll tax subsidies are supposed to compensate for these various hikes. In addition, as mentioned above, the Aubry II law set a so-called GMR (monthly wage guarantee) so that monthly pay of workers could not decrease. Every year, this GMR increased by the amount of inflation and by half the increase of monthly blue collar pay.⁵

At the same time, the Aubry II law tried to favor wage increase moderation through negotiations with the

⁴ The theory chapter is clear about wage reactions to hours reduction and their potential consequences.

⁵ In contrast, the minimum wage increases by inflation and by half the increase in hourly blue-collar pay (which increased faster in those years than its monthly equivalent) because of the progressive transition to 35 hours.

firm unions. Indeed, a common feature of agreements that were signed appears to exchange hour flexibility and wage moderation against decrease in total hours worked.

Until 2005, there were 5 GMR's: GMR1 for firms that went to 35 between July 1998 and end-June 1999; GMR2 for firms that went to 35 between July 1999 and end-June 2000; GMR3 for firms that went to 35 between July 2000 and end-June 2001; GMR4 for firms that went to 35 between July 2001 and end-June 2002; and GMR5 for firms that went to 35 hours after this last date.

Monthly pay could differ by more than 40 euros in July 2001 for workers affected by these GMRs and more than 50 euros in July 2002 (on all this, and more, see Desplatz, 2005).

In fact, workers that went to 35 hours early are at a disadvantage in comparison with workers that went to 35 hours later. In addition, workers hired in firms that are at 35 hours may indeed be compensated as 35 times the minimum wage if they are employed in a new job not covered by the guarantee (the so-called GMR). In 2002, workers just hired could receive 11.4% less than workers covered by the GMR5, even though the difference indeed decreased over time to virtually disappear now.

The Fillon Law instituted the transition to the final system with a unique minimum wage that was set up in July 2005. Firms received payroll tax exemptions for all workers below 1.7 times the minimum wage (from 26 points at the minimum wage, as in the Juppé exemptions – see Kramarz and Philippon, 2002, to zero points at 1.7 times the minimum wage). The Fillon Law also made overtime hours less costly for the firm.

3. The Effects of the 1982 Change

3.1. Two Sources of Identification

The process of reduction of the standard workweek from 40 to 39 hours was sudden, unexpected but, at the same time, took several years. In April 1982, the month in which the 1982 French Labor Force Survey took place, only a fraction of the firms had signed an agreement with their workers. The structure of hours in some firms in 1982 was identical to its structure before promulgation of the decree. Indeed, Table 4 in Crépon and Kramarz (1982) shows that the fraction of individuals employed 40 hours in the population of workers employed 40 or 39 hours was equal to 28% in 1982 and fell to approximately 20% in 1983, 1984, and 1985. Hence, the passage to the new standard continued, even after April 1982, date of the survey. In addition, negotiations resulted in new and old workweeks of equal lengths for 20% of the workforce; one

hour being counted as overtime after February 1, 1982.

These two characteristics of the process constitute the two sources of identification of the effects of the hours reduction. The reduction of the workweek was unexpected. In addition, some full-time workers were already employed 39 hours or less in 1981. Hence, it can be considered as a natural experiment. We evaluate the effect of the reduction of the workweek by comparing the employment transitions of workers employed 40 hours in 1981 with those of workers employed less than 40 hours at the same date. The identifying restriction is then that workers employed between 36 and 39 hours in 1981 are not affected by the reduction. Since most theoretical analyses also predict a negative impact on overtime workers, they also examine the employment transitions of workers employed 41 to 43 hours, exactly 44 hours (the kink in the overtime premium schedule), and 45 to 48 hours (the overtime premium jumps from 25% to 50% for all hours in excess of 44) in 1981, once again comparing them with those of the workers employed less than 40 hours at the same date.

The reduction of the workweek was also gradual, and this constitutes another source of identification. To see this, assume that, once the reduction has been negotiated with a group of workers, all such workers are employed 39 hours exactly. Hence, all those who work 40 hours in 1982 are potentially affected by the forthcoming reduction while all workers employed 39 hours at that date are not any more. Therefore, this last group is a potentially valid control group.

3.2. A Summary of the Results

Crépon and Kramarz (2002) evaluate the effect of the workweek reduction on employment to non-employment transitions using the above approaches, based on two natural experiments associated with the 1982 hours reduction. In the first one, they compare workers who worked 36 to 39 hours before 1982 with workers who worked exactly 40 hours and with those who worked overtime (up to 48 hours). In the second experiment, they use the surprise induced by the February 1, 1982 decree. In April 1982, the date at which the French Labor Force Survey took place, a sizeable share of firms had not altered their hours to the new standard. To analyze these two issues, the authors use panel data from the French Labor Force Survey (Enquête Emploi) for the period going from 1977 to 1987. Their results show that workers who were working exactly 40 hours per week in March 1981 as well as workers who were working overtime (41 to 48 hours) per week in March 1981 were less likely to be employed in 1982 than observationally identical workers who, in 1981, were working 36 to 39 hours per week. This first analysis uses differences in differences techniques by comparing transitions from 1981 to 1982, after implementation of the decree with those prevailing between 1978 and 1981, before the election of François Mitterrand.

The second analysis also demonstrates that workers still employed 40 hours in 1982 lost their jobs more

often than those already employed under the new standard workweek. Indeed, all results contained in Crépon and Kramarz (1982) show that these job losses can be directly attributed to the reduction in the workweek.

In the first analysis, the effects are significant and vary between 2.6% and 3.9% according to the technique considered. In the second analysis, the effects are also quite significant, and the authors estimate a lower bound for the induced additional job losses at 4.1%. Furthermore, they show that minimum wage workers were much more affected than others. All such results are fully consistent with predictions of most theoretical models of hours reduction, in particular since wage rigidity was binding for most low-wage workers, particularly after the 5% minimum wage increase of July 1981. In particular, this wage rigidity should have generated simultaneous job destruction and creation. Given empirical relationships between employment destruction and worker flows (Abowd, Corbel, and Kramarz, 1999), excess job destruction that is observed for low-wage workers, around 8%, corresponds to roughly 2% annual employment destruction, yielding an elasticity of employment to labor costs just below minus one, in the same ballpark as other estimates for this category (Abowd, Kramarz, Margolis, and Philippon, 2000 and Kramarz and Philippon, 2001). In addition, their results show, also in conformity with the model, that better compensated workers were less directly affected by the reduction of the workweek.

4. Going to 35 Hours

At this stage, it is important to recall crucial differences between the 1981 experience and the more recent changes. In the eighties, payroll tax subsidies in particular around the minimum wage did not exist. These payroll tax subsidies were implemented starting in 1993-1994 and expanded in the next years. Hence, even though monthly wages remained constant in the two experiments, monthly costs remained relatively constant in the second reduction of the workweek whereas it increased strongly in the first.⁶

4.1. A First Description of Firms' Adoption of the 35 Hours Workweek

To describe firms characteristics and response to the incentives put in place by the Socialist government, we present a multivariate analysis of the adoption of the various programs of hours reduction. We use a multinomial logistic regression and contrast five types of firms:

⁶ Notice that in between, researchers had started to evaluate payroll tax subsidies, minimum wage increases, using micro-data sources. These results made their way through the cabinets, as the two authors can testify when they released a first version of their 1982 workweek reduction paper. Similarly, results in Crépon and Desplatz or in Kramarz and Philippon started to change the mood vis-à-vis the impact of wage hikes on employment.

- Aubry I adopters;
- Aubry II précurseurs (or Aubry I who rejected the subsidies);
- Aubry II adopters;
- Other types of agreements and programs;
- Firms which stayed at 39 hours (the reference group).

In this analysis, as well as in the rest of the paper, we merged various data sources: the BRN (bénéfices réels normaux), a fiscal source that comprises all firms with more than 20 employees and gives information on value-added, sales, employment, profit, assets... To characterize firms in 1997, before implementation of any program of workweek reduction, we use the 1997 wave of the DADS (Déclaration annuelle de données sociales), a matched employer-employee source, which gives us the skill, the sex, the age, and the pay structure of the firm in 1997. Finally, we use the workweek-agreements data file, a source that collates all workweek reduction agreements that took place since the “de Robien” program.

Our multinomial logistic regression therefore “explains” the agreement that was signed between the firm and the firm’s employees representatives using the share in labor costs of male workers, of unskilled workers, of technicians and middle managers, the share in labor costs of various categories in the age structure, and the share of low-wage workers (in particular because payroll tax exemptions that were decided by the Aubry laws explicitly rely on workers’ wage as a ratio of the minimum wage). We also include firm level economic outcomes in the first year of the sample (1997): labor productivity (in logarithm), the average labor cost (in logarithm), capital productivity (in logarithm), the return to capital (operating income over assets).

Results are presented in Table 2. First, they show that all firms that went to 35 hours, irrespective of the agreement, are large “female” firms, i.e. large firms in which the fraction of male workers is relatively small.⁷ They are also high-labor productivity firms, with relatively low labor costs, and low-capital productivity firms. Focusing on the various subgroups, the Aubry I firms mostly comprise firms with a large fraction of low-wage workers, hence these firms benefited from the maximal amount of subsidies (on payroll taxes, incentives for employment creation, “structural help”). This appears to be true of Aubry II firms. Notice that we also include as a control, the share in labor costs of low-skilled workers who are not all minimum wage workers since they may include skilled blue collar or even some clerical workers. All firms that went 35, irrespective of the agreement, are also “young” firms (firms with many workers below age 25). Hence, those firms that stayed at 39 hours appear to be “old” firms. By contrast, these last firms seem to be relatively low-labor productivity and high-capital productivity firms with relatively high average-labor costs.

⁷ In contrast with the reference group, i.e. those firms that stayed at 39 hours.

4.2. A Productivity Decomposition

In a recent article of *Economie et Statistique*, Beffy and Fourcade (2004) analyze productivity growth over the recent period in France. The slowdown of productivity growth at the end of the nineties is certainly the main result contained in their article. In order to understand this slowdown, a phenomenon unlikely to bode well for the future of French firms, we use our data sources to decompose productivity growth over the recent period.

We analyze the 1997 to 2003 period. To decompose productivity growth, we use the classic between-within decomposition and take our nine groups (see Table 1) constructed vis-à-vis the workweek reduction program adopted. Hence, we decompose total productivity growth (in logarithms) in three parts:

1. The Between-component computed as the average productivity (of the beginning and the end of the period) of firms in the group⁸ multiplied by the change in the weights (employment) over the period under consideration for that particular group;
2. The Within-component computed as the average weights (average employment at the beginning and the end of the period) for the firms in the group multiplied by the change in productivity over the period under consideration for that particular group;
3. The Death component computed as the product of the weights at the beginning of the period of firms that died multiplied by their productivity at the beginning of the period.

Results are presented in Table 3. They are given for two sub-periods, 1997 to 2000 and from 1997 to 2003. The first column gives each group's contribution to total labor productivity growth. The next three columns give, respectively, the Between component, the Within component, and the Death component. The last column gives the number and share of firms that exit. Notice that death is defined as firms present in 1999 and absent in 2000, so that death can be, potentially at least, attributed to the phenomenon of workweek reduction.

Over the 1997 to 2000 period, productivity grew by 4.2%. And, it grew by 4.9% over the 1997 to 2003 period. Beffy and Fourcade find that productivity grew by 2% per year between 1982 and 1992. From 1997 to 2000, annual growth is approximately 1.4% but in the next three years annual productivity growth falls to 0.2 or 0.3% per year. This is obviously much less than productivity growth in the previous periods. As usual in this type of analysis, the within-component is larger than the between component for all groups *but* the Aubry I group. This is particularly troublesome. It means that *redistribution across firms* was massive. Let us start with this fact: the contribution of Aubry I firms to labor productivity growth

⁸ All productivity measures are taken in deviation from the average productivity prevailing in the economy in 1997, as computed from our data.

decreased over the 1997-2000 period, mostly because of the between-groups component. Because the previous analysis shows that Aubry I firms are relatively low-productivity firms (average productivity of this group is below average), the negative between-group component means that the group weight increased over the period. Hence, a non-negligible fraction of the slowdown of productivity is due to Aubry I firms “taking over” other firms. Or, put differently, because such low-productivity firms increased their presence, measured as a fraction of total employment, within the population of firms in our sample. This is also true, albeit at a lower rate, for Robien firms and Aubry II forerunners (“précurseurs”). Now, the within component is strong for the Robien firms, the Aubry II forerunners, the Aubry II, those firms with a “non-recorded” agreement, and finally firms with no agreement. Finally, a non-negligible fraction of productivity growth is due to firms death, but this component only comes from firms that signed no agreement and are still at 39 hours. The minus sign means that firms that died mostly come from the low end of the productivity distribution of firms that signed no agreement. Hence, one of the most striking fact emerging from this analysis is that a fraction of the low-productivity small firms were not in position to sign an agreement. The potential increase in costs they faced drove them out of business. The largest firms “benefited”, directly or indirectly from their death and gained market shares.

Results for the complete period, 1997-2003, confirm this first analysis. The between component has decreased, meaning that the reallocation across firms has now virtually finished and except for the Aubry I firms, most of the action takes place within groups. However, the death component increases. First, and as before because of firms still at 39 hours. But, also because firms that signed an early agreement (the Aubry I firms) also disappear: being low-productivity is rarely good. Another striking fact can be found in the last two columns. The number of firms that die explodes for most groups that went to 35 hours (the number is multiplied by 20 in comparison with panel 3a, for period 1997-2000, when it is multiplied by less than 2 for firms that stayed at 39 hours). A more detailed analysis of the death process will be presented later in this text.

4.3. Workweek Reduction Agreements and Economic Outcomes

In this subsection, we study how firms that signed the various types of agreements over our analysis period changed. In particular, we study how employment, value-added, labor costs further decomposed into wages and payroll taxes, labor productivity, capital, return on capital, and capital productivity were affected by the different regimes of workweek reduction agreements. Our analysis cannot be fully causal. As is easily seen from our previous paragraphs, it is far from obvious to find a good model of why and when firms decided to go to 35 hours, and sign an agreement with their workers. In particular, we do not have in our data set a magic instrumental variable that would affect the decision to reduce working time

without having an impact on economic outcomes. An attempt in this direction is given in Crépon, Leclair, and Roux (2004). By contrast, we focus here on a control variables approach, i.e. we try to include as many “beginning of period” variables that should have affected the decisions, to analyze the relation between workweek reduction and economic outcomes.

Table 4 presents our results. The first panel shows estimates for variables related to employment and labor costs, all measured in logarithms, and in difference between the beginning and the end of the period. The second panel shows estimates for variables related to capital, including total factor productivity. For each panel, we present estimates for the first sub-period, 1997-2000, and estimates for the full analysis period, 1997-2003. The variables that are used to control for observed heterogeneity and approximate unobserved heterogeneity, as much as possible at least, are those used in the analysis presented in Table 2. These results are robust to the presence or exclusion of most control variables.

The first panel allows us to better understand the productivity decomposition results obtained in the previous subsection. Value-added increased over the years 1997-2000 for all groups of firms that signed a workweek reduction agreement, in comparison to firms that signed no agreement. At the same time, employment increased quite strongly, decreasing labor productivity for all four groups of firms, again in comparison with firms that stayed at 39 hours. The main reason for this is found in column three to five: labor costs decreased for these firms; because of wage moderation, wages decreased and payroll tax plummeted. Hence, all sorts of wage subsidies that were put in place by the various Laws operated and led these firms to create employment. Results for the full period have a very similar taste. For all groups, value-added virtually doubled in comparison with those firms that never signed an agreement. Employment also increased quite strongly.

Results for capital-related variables are presented in the second panel. They show that capital also increased albeit not as strongly as employment did. Capital productivity did not change much. Profitability was not altered massively. And total factor productivity appears to have decreased over the first period and stabilized or even increased between 2000 and 2003, except for the Aubry II forerunners.

To better understand results pertaining to total factor productivity, it is important to explain how this variable is constructed. In particular, how it can be constructed and interpreted in a simple Cobb-Douglas framework.

First, we assume that firms’ operations are based on a simple production Cobb-Douglas production

function. The respective contributions of employment and capital are 0.7 and 0.3, i.e. the labor and capital shares in the economy. Hence, production can be written as $Q = AL^\alpha K^{1-\alpha} h^{1-\varepsilon}$ where $\alpha=0.7$ (as mentioned above) and where we try to derive the value of ε from our analysis. To do this, we take the weighted sum of labor and capital productivity (in logarithms) using the labor and capital shares just mentioned. Hence, the resulting measure is in fact the so-called Solow residual. It includes, given our definition of production, prices (assumed exogenous in a competitive framework), demand shocks (as measured by Q_0 such that $Q \leq Q_0$), and hours (in logarithms). Taken in difference between 1997 and 2000 or between 1997 and 2003 (as in the last columns of Table 4b), we can derive an estimate of ε for each different group of firms and type of work-sharing agreement, together with a convenient and simple analysis framework to discuss the results.

In light of this little model, which complements the discussion of the theory chapter, let us see what can be said of the Aubry I firms. First, total factor productivity decreased by 3.4 percentage points between 1997 and 2000. Therefore, our estimate of estimate of $1-\varepsilon$ is computed as $(-3.4)/(-11.0)$ since hours decreased by 11%. This yields a value of $\varepsilon=0.7$. When hours decrease by 10%, production decreases by 3%, at fixed capital and employment, i.e. in the short-run. This means efficient workplace, production reorganization, and improved worker efficiency due to less fatigue (see the theory chapter). The stabilization of our Solow residual after 2000 (in contrast to firms that remained at 39 hours) validates our ideas that work-sharing is a short-term phenomenon. Indeed, the Solow residual should reflect the differential effect of hours change between 35- and 39-hours firms; hence, it should be zero after 2000 for firms that completed their reorganization. Furthermore, in the ensuing years (2000 to 2003), employment and capital continued their increase in the Aubry I firms. Because our results on the Solow residual appear to validate our discussion, the only explanation for these facts are that Aubry I firms were hit by positive demand shocks, not directly related to the workweek reduction that took place within firm. To continue on this reasoning, assuming that these demand shocks were constant across the two sub-periods, the “real” effect of work-sharing on employment growth is significantly less than the 10.5% observed for these firms over the 1997-2000 period.

More precisely, labor demand (in first difference) as derived from the above model is equal to $\Delta \log L = \Delta \log Q_0 - (1-\varepsilon)\Delta \log h - (1-\alpha)\Delta \log \frac{w}{c}$ where w and c respectively denote the cost of labor and the cost of capital (and recalling that, in each period, firm produces at most Q such that $Q \leq Q_0$). Now, we measure all these elements directly and essentially we may confront our estimates of the demand shocks as derived from this equation with those coming from Table 4a, given in column labeled “value-added” . From Table 4a, we know that the left hand-side of the equation is equal to 10.5% (again for the Aubry I

firms). The second term of the right hand-side of the equation is given by the Solow residual (equal to 3.4%, see above). Assuming that capital costs were unchanged over the 1997-2000 period, the third term is equal to $(1-0.7)*6.6\% = 2\%$ (see Table 4a, column "labor costs"). Therefore, demand shocks contribute to 5.1% -- exactly the number found in Table 4a -- of employment growth over the 1997-2000 period, decreased labor costs contribute to 2% of this growth, and pure work-sharing effects contribute to 3.4% of employment growth (as long as profitability conditions are met, a possibility offered by payroll tax subsidies, otherwise firms may disappear or reduce employment).

Now, for the Aubry II forerunners, even though they went to 35 hours at the same time as the Aubry I, hours were redefined, involving less within-firm reorganization. In addition, since capital productivity continues to grow after 2000, it surely means that firms are still in the process reorganization. The process of capital accumulation is not completed, as evidenced also by the very large increase in the returns on capital.

As for the Aubry II firms, they started their passage to 35 hours later. Total factor productivity growth in 2003 is exactly equal to that observed for Aubry I firms, a potential reflection that the adjustment process has ended. Employment increases, again a potential reflection of positive demand shocks affecting these firms after the death of both 35 hours and 39 hours firms.

Understanding the mechanisms at work is arguably not easy. Many phenomena interact as evidenced by our employment decomposition. In particular, our productivity decomposition shows that there has been a reshuffling within manufacturing firms. Some firms benefited when others could not survive this shock therapy. In addition, we do not know the source of the demand shocks that affected the firms. It is not impossible that they come from the death process that took place during this period and might have been accelerated by the work-sharing policy. At this stage, we do not know enough about these type of problems but they appear to be serious to deserve a further analysis.

To go a step further though, we estimate the survival probability of firms conditional on our usual 1997 variables and the agreement signed between 1997 and 2001. We restrict attention to firms that survived at least until 1999. Death is measured in 2003. Results are presented in Table 5. They complement the numbers presented in Table 3 (the productivity decomposition). In Table 3, firms that signed an agreement apparently survived much better until 2000 than those that remained at 39 hours. The diagnosis is quite different viewed from 2003. Aubry I firms and Aubry II forerunners, i.e. only those firms that signed agreements early on, have a larger survival probability than firms at 39 hours, as measured in 2003. But firms that signed later agreements cannot be distinguished from those at 39 (conditional on firm-level

variables for the year 1997).

4.4. Workweek Reduction Agreements and Working Schedules

In this subsection, we rely on Afsa and Biscourp (2004) who carefully investigated the relationship between workweek reduction and working schedules of different types of workers employed in different types of firms. Their analysis uses matching techniques in order to identify causal effects of signature of an agreement on the schedules of work. We will not detail elements of the techniques used but encourage the reader to go to the original analysis.

The data sources that are used match data on individuals (the French labor force survey) with data on the employing firm using the so-called Siren number, a unique identifier of French firms. On the firm side, they use data sources quite similar to ours (the BRN, the DADS, and the workweek reduction agreement file).

Table 6 presents simple statistics for different categories of workers (skills) contrasting the schedule in 1995 with that prevailing in 2001 in firms with no agreement (in 2001, top panel) versus firms with a workweek reduction agreement (bottom panel). The Table differentiates regular, cyclical, and irregular schedules. Managers and Engineers working in firm without a workweek reduction agreement appear to have more regular schedules in 2001 than in 1995. Their equivalent in firms having signed an agreement appear unaffected (implying that the difference between these firms increased). However, all other types of workers in firms with an agreement work less regular schedules when their equivalent in firms with no agreement appear unaffected. For workers employed in the former, irregular schedules decreased but cyclical schedules increased as if signature of an agreement involved more predictability.

Tables 7a and 7b present similar results for firms in manufacturing industries and service industries, respectively. The first columns of each Table give results for firms with less than 50 employees whereas the next columns give results for firms with 50 employees or more.

Most of the action takes place in small firms within manufacturing industries. Regular schedules strongly decrease apparently replaced by cyclical schedules. In large firms, the effects are not massive and regular schedules seem to decrease when irregular schedules increase.

To go a step further, Afsa and Biscourp (2004) apply econometric techniques (matching, as mentioned above) and try to control for confounding factors in order to isolate the causal effect of workweek reduction on work schedules. Results are presented in Table 8.

Indeed, they confirm that workweek reduction causes more cyclical and more irregular schedules. The effects are stronger in manufacturing where schedules become more irregular. Managers and engineers are particularly affected by these irregular schedules when non-managers are equally affected by more cyclical and more irregular schedules. In small firms, most of the change is due to cyclical schedules that become more prevalent when irregular schedules only increase in large firms. Going into finer details, the contrast between managers-engineers and other types of employees is clear: hours have become more irregular for the former whereas days are more irregular for the latter. Finally, 4x8 and 5x8 shifts have also increased because of workweek reduction.

The final table, Table 9, tries to assess how working conditions were affected because of workweek reduction. All types of “difficult” working conditions increased after signature of an agreement: evening and night work, Sunday work. Because annualization of hours – defining hours of work over the year rather than over the week or over the month -- increased virtually everywhere because of workweek reduction and signature of an agreement, part-time work should be of less interest. It is indeed the case in all industries as well as in small firms. Finally, all these new schedules appear to have generated a tighter control of hours worked for the non-managers working in small firms.

5. Conclusions

From the two French experiments described in this chapter, we believe that the following lessons can be derived. First, per se, work-sharing does not create jobs if profitability conditions are not met, on the contrary. If one wants to maintain the monthly wages of affected workers and to maintain the profitability of affected firms, this type of policy demands subsidies, most likely subsidies for low-wage workers. Our results show that for the Aubry I firms, for a total employment growth equal to 10.5% over the 1997-2000 period, pure demand shocks contribute to 5% of this growth, decreased labor costs contribute to 2% of the same growth, and finally, pure work-sharing effects contribute to 3.4% of employment growth (as long as profitability conditions are met, a possibility offered by payroll tax subsidies, otherwise firms may disappear or reduce employment). Results from Crépon and Desplatz (2002) show that such subsidies tend to help low-productivity firms. Simultaneously, many low-productivity firms, in particular those that did not go 35 hours, died after introduction of the new workweek. Hence, the policy seems to have done two opposite things simultaneously: it helped and killed apparently similar firms, i.e. low-productivity manufacturing firms with a relatively large fraction of low-wage workers. But identification of these effects are very difficult. More investigation is needed to better understand the differences that pre-existed

between these firms and led them to adopt or reject the 35 hours workweek. Many consequences of the policy are not well understood yet: the shock was massive and acted in various directions. However, we know for sure that workweek reduction was accompanied by wage moderation and more irregular schedules for most workers; these are two clear sources of deterioration of workers' welfare.

Table 1: Summary Statistics

	Number of Firms	Share of Firms	Share of Employment	Employment
Robien	1,549	0.0239	0.0759	563,832
Aubryl	11,749	0.1813	0.2212	1,643,773
Aubryll Précurseurs	2,378	0.0367	0.1111	825,687
Aubryll	9,930	0.1533	0.1825	1,356,160
Aubryll less than 50 employees	333	0.0051	0.0012	9,202
Agreement but not recorded	5,763	0.0890	0.0771	573,043
Non eligible	1,730	0.0267	0.0368	273,579
Aubry I "defensif"	687	0.0106	0.0150	111,598
No agreement	30,669	0.4734	0.2791	2,073,576
Total	64,788			7,430,450

Source: BRN, DADS, Worksharing agreement file

Table 2: Agreements and Economic Structure

	Aubryl	Aubryll forerunner	Aubryll	Other Agreement
Intercept	-0.80 (0.32)	-3.16 (0.59)	-2.04 (0.37)	-0.94 (0.37)
<i>Shares in labor cost of:</i>				
Male Workers	-0.28 (0.07)	-0.92 (0.15)	-0.43 (0.08)	-0.27 (0.10)
Unskilled Workers	-0.13 (0.09)	1.13 (0.18)	0.07 (0.10)	0.55 (0.11)
Intermediate Skills	-0.27 (0.09)	-0.14 (0.18)	-0.24 (0.10)	-0.02 (0.11)
Less than 25	0.83 (0.19)	5.06 (0.30)	-0.24 (0.25)	1.25 (0.26)
40 - 55	0.20 (0.11)	1.41 (0.24)	0.24 (0.13)	-0.35 (0.14)
more than 55	-1.22 (0.12)	0.95 (0.26)	-0.58 (0.13)	-0.63 (0.14)
Low Wage Workers (share)	0.66 (0.07)	-0.28 (0.15)	0.25 (0.08)	-1.42 (0.08)
50-100 employees (size)	0.38 (0.03)	0.85 (0.07)	0.78 (0.03)	0.24 (0.04)
100-250 employees (size)	0.61 (0.04)	1.83 (0.07)	1.24 (0.04)	0.24 (0.06)
250-500 employees (size)	1.18 (0.08)	2.61 (0.10)	1.75 (0.07)	-0.02 (0.13)
more than 500 employees (size)	1.72 (0.11)	3.65 (0.12)	2.29 (0.10)	0.71 (0.16)
Labor Productivity (log)	0.07 (0.05)	0.62 (0.09)	0.23 (0.06)	0.17 (0.07)
Average Labor Cost (log)	-0.21 (0.08)	-0.75 (0.14)	-0.27 (0.09)	-0.19 (0.09)
Productivity of Capital (log)	-0.05 (0.02)	-0.13 (0.03)	-0.11 (0.02)	0.03 (0.02)
Return on Capital	0.05 (0.04)	0.03 (0.09)	0.00 (0.05)	0.04 (0.05)

Source: BRN, DADS, Agreement file. Multinomial logit estimated by maximum likelihood. The regression also includes sectoral indicators

Table 3a: Productivity Decomposition (1997-2000)

Agreement	Exit		
	Total	Within	Between
Robien	1.59	1.79	-0.21
AubryI	-1.82	-0.14	-1.71
AubryII Précurseurs	0.62	1.12	-0.53
AubryII	0.61	0.50	0.09
AubryII less than 50 employees	0.01	0.01	0.00
Agreement but not recorded	0.83	0.75	0.06
Non eligible	0.28	0.11	0.19
Aubry I "defensif"	-0.04	-0.06	0.01
No agreement	2.14	1.25	0.09
Total	4.21	5.34	-2.00

Agreement	Exit		
	Number	Share	
Robien	16	0.06	
AubryI	88	0.29	
AubryII Précurseurs	18	0.04	
AubryII	58	0.06	
AubryII less than 50 employees	1	0.00	
Agreement but not recorded	79	0.07	
Non eligible	21	0.08	
Aubry I "defensif"	8	0.01	
No agreement	4,617	9.14	
Total	4,906	9.74	

Table 3b: Productivity Decomposition (1997-2003)

Agreement	Exit		
	Total	Within	Between
Robien	1.49	1.81	-0.15
AubryI	-1.05	0.23	-1.73
AubryII Précurseurs	1.56	1.47	0.13
AubryII	0.00	-0.06	0.07
AubryII less than 50 employees	0.01	0.01	0.00
Agreement but not recorded	0.73	0.62	0.03
Non eligible	0.06	0.04	0.12
Aubry I "defensif"	0.02	-0.13	0.05
No agreement	2.09	0.90	0.00
Total	4.92	4.89	-1.49

Agreement	Exit		
	Number	Share	
Robien	225	1.01	
AubryI	1,386	1.95	
AubryII Précurseurs	329	1.52	
AubryII	1,064	1.88	
AubryII less than 50 employees	26	0.01	
Agreement but not recorded	776	0.65	
Non eligible	228	0.46	
Aubry I "defensif"	141	0.25	
No agreement	7,170	11.09	
Total	11,345	18.81	

Table 4a: Agreements and Economic Outcomes (Employment and Labor Costs)

	Value added	Employment	Labor Cost (per emp.)	Average Wage	Payroll Taxes	Labor Productivity
	Period : 1997-2003					
Aubryl	0.108 (0.006)	0.171 (0.005)	-0.072 (0.003)	-0.047 (0.003)	-0.136 (0.003)	-0.063 (0.004)
Aubryll Précurseur	0.082 (0.013)	0.113 (0.011)	-0.070 (0.006)	-0.056 (0.006)	-0.107 (0.007)	-0.030 (0.008)
Aubryll	0.056 (0.007)	0.104 (0.006)	-0.047 (0.003)	-0.031 (0.003)	-0.088 (0.004)	-0.048 (0.004)
Other Agreement	0.017 (0.008)	0.026 (0.007)	-0.014 (0.004)	-0.014 (0.004)	-0.016 (0.005)	-0.009 (0.006)
R ²	0.08	0.10	0.25	0.24	0.21	0.19
	Period : 1997-2000					
Aubryl	0.051 (0.004)	0.105 (0.003)	-0.066 (0.002)	-0.031 (0.002)	-0.164 (0.003)	-0.053 (0.003)
Aubryll Précurseur	0.016 (0.008)	0.052 (0.007)	-0.056 (0.004)	-0.038 (0.004)	-0.104 (0.005)	-0.036 (0.006)
Aubryll	0.035 (0.004)	0.052 (0.004)	-0.023 (0.002)	-0.018 (0.002)	-0.035 (0.003)	-0.017 (0.003)
Other Agreement	0.010 (0.005)	0.024 (0.004)	-0.014 (0.003)	-0.013 (0.003)	-0.019 (0.003)	-0.014 (0.004)
R ²	0.08	0.10	0.20	0.18	0.21	0.14

Regressions include all variables of Table 2 as control variables. 1997-2003 : 43,779 observations ; 1997-2000 : 47,866 observations

Table 4b: Agreements and Economic Outcomes (Capital)

	Capital	Return on Capital	Capital Productivity	Total Factor Productivity
	Period : 1997-2003			
Aubryl	0.087 (0.007)	0.005 (0.004)	0.021 (0.007)	-0.038 (0.004)
Aubryll Précurseur	0.023 (0.013)	0.046 (0.009)	0.059 (0.014)	-0.001 (0.008)
Aubryll	0.064 (0.007)	-0.006 (0.005)	-0.008 (0.007)	-0.036 (0.004)
Other Agreement	0.007 (0.009)	-0.008 (0.006)	0.010 (0.009)	-0.002 (0.005)
R ²	0.11	0.24	0.13	0.19
	Period : 1997-2000			
Aubryl	0.043 (0.004)	0.017 (0.004)	0.008 (0.005)	-0.034 (0.003)
Aubryll Précurseur	0.005 (0.008)	0.012 (0.007)	0.011 (0.009)	-0.021 (0.006)
Aubryll	0.032 (0.005)	0.002 (0.004)	0.002 (0.005)	-0.011 (0.003)
Other Agreement	0.015 (0.006)	-0.004 (0.005)	-0.005 (0.006)	-0.010 (0.004)
R ²	0.09	0.18	0.11	0.15

Regressions include all variables of Table 2 as control variables
1997-2003 : 43,779 observations ; 1997-2000 : 47,866 observations

Table 5: Survival Probability

Aubryl	0.021	(0.007)
Aubryl Précurseur	0.059	(0.014)
Aubryl	-0.008	(0.007)
Other Agreement	0.010	(0.009)

Estimated by maximum likelihood. 56,183 observations.
Includes same controls as Table 2.

Table 6: Workweek Reduction and Work Schedule

Workweek Agreement (in March 2001)	Schedule	Managers, Engineers		Technicians		Clerical Workers		Blue-Collar Workers		Total	
		1995	2001	1995	2001	1995	2001	1995	2001	1995	2001
No	Regular (week)	66	77	69	72	76	75	76	76	73	75
	Cyclical	2	1	7	5	6	5	12	9	8	6
	Irregular	32	22	24	23	17	20	13	15	19	19
Yes	Regular (week)	71	72	69	64	69	62	59	56	66	62
	Cyclical	3	3	10	13	12	12	27	27	15	17
	Irregular	26	25	21	23	19	25	14	17	19	22
Total	Regular (week)	68	74	69	67	73	68	68	65	70	67
	Cyclical	2	2	8	10	9	9	19	19	12	12
	Irregular	29	24	22	23	18	23	13	16	19	20

From Atsa and Biscourp (2005). Sources : French labor force surveys, 1995 and 2001 (including complementary surveys) ; Workweek reduction agreements file ; DADS ; BRN. Coverage: All private and semi-private firms, excluding agriculture and domestic services.

**Table 7a: Workweek Reduction and Work Schedule, by Industry and Size
(Manufacturing)**

Workweek Agreement (in March 2001)	Schedule	Less than 50 Workers			50 Workers or More			Total	
		1995	2001	1995	1995	2001	1995	2001	
No	Regular (week)	83	85	67	67	67	76	81	
	Cyclical	5	4	20	22	22	11	8	
	Irregular	12	11	13	11	11	13	11	
Yes	Regular (week)	80	68	63	60	60	65	61	
	Cyclical	8	18	23	24	24	21	23	
	Irregular	13	14	13	16	16	13	16	
Total	Regular (week)	82	81	64	61	61	71	69	
	Cyclical	5	8	22	24	24	16	17	
	Irregular	12	12	13	15	15	13	14	

**Table 7b: Workweek Reduction and Work Schedule, by Industry and Size
(Services)**

Workweek Agreement (in March 2001)	Schedule	Less than 50 Workers			50 Workers or More			Total	
		1995	2001	1995	1995	2001	1995	2001	
No	Regular (week)	74	73	67	70	70	72	72	
	Cyclical	5	5	8	6	6	6	5	
	Irregular	21	22	25	24	24	22	23	
Yes	Regular (week)	73	67	65	61	61	66	62	
	Cyclical	7	10	12	13	13	11	13	
	Irregular	19	23	23	26	26	23	25	
Total	Regular (week)	74	71	65	62	62	69	66	
	Cyclical	6	6	11	12	12	9	9	
	Irregular	20	23	24	26	26	22	24	

From Afsa and Biscourp (2005). Sources : French labor force surveys, 1995 and 2001 (including complementary surveys) ; Workweek reduction agreements file ; DADS ; BRN. Coverage: All private and semi-private firms, excluding agriculture and domestic services.

Table 8: Impact of Workweek Reduction on Work Schedules

Schedule (ref: regular (week))	Total	Managers. Engineers	Non Managers	Manuf.	Services	Less than 50 workers	50 workers or more
Cyclical or irregular	4.7***	9.2**	4.1***	6.9***	3.7***	7.9***	4.9**
Irregular	3.6***	8.7**	2.8**	6.4***	2.7*	4.1**	4.7***
Irregular (days)	2.6**	3.6**	2.5**	5.2***	1.6	2.2**	4.7**
Irregular (hours)	1.4	7.2**	0.4	2.1	1.3	2.9	1
Irregular (days or hours)	0.6	1.6	0.5	0.6	0.7	0.1	1.7
Cyclical	3.4***	2.5	3.7***	3.8*	3.0***	7.2***	2.5
Cyclical (no shifts)	3.4***	1.5	3.8***	6.9***	2.3***	3.3**	5.0***
Cyclical with shifts (2 x 8. 3 x 8)	-0.5	0.4	-0.6	-2.5*	0.8	6.0**	-1.8**
Cyclical with shifts (4 x 8. 5 x 8)	2.0***	0.5	2.3***	4.2**	0.8**	0.9**	2.3**

From Afsa and Biscourp (2005). Sources : French labor force surveys, 1995 and 2001 (including complementary surveys) ; Workweek reduction agreements file ; DADS ; BRN. Coverage: All private and semi-private firms, excluding agriculture and domestic services. Level of significance : *** : 1 % ; ** : 5 % ; * : 10 %.

Table 9: Impact of Workweek Reduction on Working Conditions

	Total	Managers. Engineers	Non Managers	Manuf.	Services	Less than 50 workers	50 workers or more
Work Schedules							
Evening Work (20h to 0h)	3.9***	8.6**	2.8**	6.1***	3.0**	0.9**	2.3**
Night Work (0h to 5h)	2.8***	5.7*	2.4***	4.3**	2.0**	2.7*	2.2
Saturday Work	1.9	5.5	1.2	0.8	2.5	-2.7	4.9**
Sunday Work	2.4**	5.4*	1.7	1.7	2.4**	1.6	3.2*
Annualization	9.2***	3.3	9.9***	9.0***	9.5***	9.8***	9.8***
Part-time	-2.3***	-1.6	-2.0**	-2.3	-2.4**	-2.9**	0
Control of hours	2.1*	-1.3	3.1**	2.5	1.8	6.2***	2.5
Reference Day							
Days worked	-4.5***	-6.5	-4.4***	-2.9	-5.2***	-3.3	-11.7*
Hours worked	-0.38***	-0.59**	-0.38***	-0.34**	-0.39***	-0.21	-0.32**
Hours worked (full time)	-0.39***	-0.69**	-0.37***	-0.30*	-0.44***	-0.20	-0.32*
Regular Schedule							
Usual weekly hours	-0.64***	1.08*	-1.03***	-0.68*	-0.62**	-0.58	-1.16***
Usual weekly hours (full time)	-0.80***	0.68	-1.21***	-0.90***	-0.72***	-0.86**	-0.92***

From Afssa and Biscourp (2005). Sources : French labor force surveys, 1995 and 2001 (including complementary surveys) ; Workweek reduction agreements file ; DADS ; BRN. Coverage: All private and semi-private firms, excluding agriculture and domestic services. Level of significance : *** : 1 % ; ** : 5 % ; * : 10 %.

Chapter 4: Unions, Working hours and Absence: Sweden

Despite the presence of strong unions, working time reductions targeted at employment creation has not been a prominent policy tool in the Nordic countries with the exception of Denmark in the 1980s. Remarkably, Swedish unions never demanded such policy measures even during the 1990s when unemployment rose to unprecedented levels. As a consequence, standard working hours of full time workers in most Nordic countries are relatively long. However, to conclude from this fact that Nordic people are not as “lazy” as other Europeans would be hasty. Even though legislated and contractual working hours are relatively long, there exist very generous (by international standards) subsidized schemes of career interruptions, that eventually reduce actual hours. According to OECD (2005), almost one week in five is lost in Sweden due to “absence for other reasons than holidays”. In addition to the menu of career interruption policies already available in the Nordic countries, recent policy experiments have instituted career break schemes with the stated objective to alleviate the burden of unemployment by redirecting labor demand from workers in need of interruptions towards unemployed workers in need of work, i.e. as work sharing policies.

The purpose of this section is to present three important conclusions based on “Nordic” experiences. First, strong unions do not necessarily mean short weekly working hours and, specifically, strong unions do not always demand working time reductions in order to preserve employment. Second, explicit working time reductions are not the only policies that reduce actual hours worked. Policies that promote absence or career interruptions have the same motivations as working time reductions and induce substantial reductions in actual hours worked in these countries. Third, recent policy experiments using career interruptions as work sharing policies had negative effects on participants subsequent wages and are not likely to have contributed to the employability of the long-term unemployed, in contrast to the initial intention. This suggests that work sharing through career interruptions is not an attractive policy option.

1. Unions and working time reductions in Sweden

The typical weekly working time for Swedish full time workers is 40 hours (OECD, 2003). Despite relatively long weekly hours, annual working hours are around OECD average (OECD, 2005). Although part-time work is fairly common among females, the main reason for the disparity between long standard hours and average actual hours comes from frequent use of generous subsidized absence schemes. This section discusses why the working hours of Swedish workers are “lumped” in this

sense.

At a first glance, the conditions for working time reductions appear very favorable in Sweden. Unions are strong; union membership and coverage rates are among the highest in the world.¹ Furthermore, the working time Act allows the bargaining parties to change (almost) all of its content in favor of either of the parties. However, Swedish unions have rarely pushed for working time reductions, at least not successfully, and they have never argued for working time reductions as a means to reduce unemployment, in sharp contrast with other labor movements in many European countries (SOU, 2002).

The absence of work sharing in the debate on working hours also carries through the motivations of the legislated reductions in weekly hours implemented during the 1900s. In 1920, a 48 hours workweek was instituted with the motivation that it would reduce workplace accidents and increase workers leisure and time spent as active citizens. Between 1957 and 1960, a 45 hours workweek was instituted as a general welfare reform. Since the law was motivated in such general terms, it also opened the possibility for agreements that could change the content of the law. In 1973, legislation implemented the current 40 hours standard work week. Its main motivation was allowing blue collar workers to be on par with white collar workers, who already had struck agreements on a shorter work week. The same general motivations were present in the vacation laws of 1951 (3 weeks), 1963 (4 weeks), and 1979 (5 weeks), including health concerns, welfare, and equality.²

One possible explanation for this reluctance to use working time reductions in order to try to increase employment can be found in the origins of “the Swedish model”.³ During the 1950s Swedish unions, employers, and the government agreed upon a set of rules for the labor market. The basic principles were simple: centralized wage setting would lead to “equal pay for equal work” and thus prevent that a firm’s productivity affected its pay. Such a principle was designed to force low-productivity businesses to exit, and allow high-productivity firms to thrive, and therefore promote productivity growth through mobility from low to high productivity sectors and firms. Being a small open economy, highly dependent on trade, retaining Sweden’s international competitiveness was a central concern. The solution was to allow wage increases be determined by the industries subject to international competition in order to avoid excessive wage pressure from industries (such as services and construction) in which international competition was not a problem. Unemployment insurance combined with active labor market policies ensured that laid off workers would be adequately

¹ Presumably this is partly explained by a link between union membership and unemployment insurance eligibility, the so called “Gent system”.

² This paragraph builds on SOU (2002).

³ See e.g. Forslund (1997), Edin and Topel (1995), Nilsson (1993), Hibbs and Locking (1996) for discussions about the Swedish model.

compensated and made able to move to parts of the economy where demand was high. Central in the objectives of this centralized model were growth and full employment, with the acceptance of constant restructuring and creative destruction. Thus, job creation was considered the outcome of a profit-oriented economy, and working time arrangements were mainly seen as a choice between leisure and consumption.

During the 1970s there were growing concerns among the employers that the unions had abandoned the “equal pay for equal work principle” for an unconditional “equal pay” principle. Eventually, this conflict led to the abandoning of centralized bargaining when a separate engineering contract was struck in 1983. Since the rejection of centralized agreements, the three-tiered system with agreements at the central, industry and firm-levels was changed into a two-tiered system. Interestingly, this fragmentation of bargaining did not lead to a rise in demands for work sharing arrangements even though it coincided with a period during which the working time debate was flourishing in Continental Europe.

The only major working time reduction that took place during the 1980s was directed to shift workers (rotating between two shifts). This reduction of 2 hours per week was motivated by health and welfare concerns and implemented gradually between 1983 and 1988. The implementation was intended to be flexible and its precise design was up to the local parties. In fact, the reduction only led to a reduction of actual hours corresponding to about one third of the original agreement (see Skans, 2004). Apparently, the measure was not extensively implemented at the local level. In line with evidence from working time reductions in other countries (see e.g. Hunt, 1999) hourly wage rose so as to keep monthly wages constant.

Some could argue that exceptionally low unemployment in Sweden and other Nordic countries during the period made the issue of work sharing superfluous. However, during the early 1990s the Swedish labor market collapsed and unemployment rose to levels not experienced since World War II. And not even under these extreme conditions were there any demand for work sharing arrangements.

Since the late 1990s though, a slow move towards gradual working time reductions was included in many industry-level agreements (see SOU, 2002). These reductions have typically been implemented in a very flexible way, allowing for local parties (or the individual) to decide how they should be arranged and accepted. The options vary between agreements but ranges from weekly scheduled reductions, yearly reductions or pension provisions to cash compensation. Existing studies of their implementation suggest that the outtake in form of hours has been limited and represents roughly half of the agreed-upon reductions (Malmberg et al, 2003). The motivation for these reductions, again, is not in terms of work sharing, but in general welfare terms as a choice of leisure over pay. This is

highlighted by explicit formulations in the agreements where the value of a reduction is measured in terms of a corresponding wage increase.

Two striking features should come out of this description. First, none of the actual working time reductions have been motivated by work sharing concerns and Swedish unions have never raised the argument. One explanation for this could be the centralized model with its natural focus on growth and international competitiveness; another explanation is the low unemployment rate. However, even when these two conditions disappeared, work sharing arguments were never favored by the unions. Second, despite strong unions, flexible working time laws and the abandonment of centralized wage bargaining in the early 1980s, very little has actually happened with weekly standard hours. It took 20 years after the last revision of the vacation law, and 25 years after the last revision of the weekly hours' legislation, for the industry level agreements on working time restrictions to be struck. And even when hours were reduced through collective agreements, the implementation was very slow, leaving great scope for arguments to be overrun at the local level, an option that appears to have been used extensively.

It is difficult to pinpoint an exact explanation for this pattern. However, the inheritance from the centralized growth-oriented era has certainly played a role, at the very least because the labor movement remained coordinated through the blue-collar union confederation (LO) and its links with the Social Democratic party. An alternative explanation for the reluctance to implement hourly reductions may have been the generous provisions of career interruptions schemes discussed below.

2. Subsidies of absence

According to OECD (2005), Sweden is the country where the largest number of workweeks are lost due to absence among 22 European countries surveyed. 9.8 weeks per year, i.e. almost one in five, are lost due to "absence for other reasons than holidays". Sweden is closely followed by Norway, then Finland and Iceland whereas Denmark ranks 7th. Thus, it seems fair to state that absence is, by international standards, high in the Nordic countries in general. Due to these high absence rates, actual hours worked per individual are around the OECD average (OECD, 2005). Part of the high absence rates are explained by comparably high rates of sickness absence, but other generous policies such as extensive parental leave schemes and educational leave policies contribute as well.

Currently, Swedish policies grant parents the right to 16 months of subsidized leave (with at most 14 months for each parent) to be taken out before school starting age with the right to return to the

employer afterwards. Furthermore, there are various ways to prolong this leave e.g. by only taking out leave during weekdays which prolongs the leave but reduces weekly earnings or by utilizing an additional right to unpaid leave during the child's first year.

This scheme was designed to include more women in the labor force, an idea that gathered momentum in the early 1970s. Consequently, generous parental leave schemes were introduced (increasing from 6 months in 1974 to 12 months in 1980), and complemented by subsidized day care and individualized taxation which, in the context of a progressive tax scale, greatly favored female labor force participation. This change induced a growth in female labor force participation that culminated at the end of the 1980s when female employment rates were nearly as high as those for males. The growth of female participation was initially a phenomenon caused by part-time work, with full-time employment becoming progressively more important, although part-time employment today is mostly a female phenomenon (see OECD, 2003).

Even if career interruptions increase labor force participation as suggested e.g. by evidence in Ruhm (1998), they tend to reduce the supply of hours. In this sense, they reduce the scope for working time reductions. Furthermore, as shown in the theory chapter, the value of leisure or home production is likely to increase the push for working time reductions. By subsidizing breaks when the value of home production is at its greatest it is possible that demands for general working time reductions are reduced. Hence, working time reductions and career interruptions are likely to be policy substitutes. This feature is further highlighted when the introduction of career interruptions policies were explicitly motivated by work sharing concerns in Sweden during the last 10 years (the same happened in Finland and Denmark). Even though such policies build on a long tradition of publicly subsidized career interruptions, it entailed a dramatic change since it allowed for the first time interruptions without an external cause (such as sickness, studies or child care) and, more importantly, it was the first policy directed at reducing labor supply (in a law or in an agreement) motivated by work sharing arguments in Sweden.

As discussed above, work sharing was never a prominent idea among Swedish unions, the same holds for the closely linked Social Democratic Party which was in government during all but 10 years since World War II. On the Swedish political arena however, work sharing ideas had some support within other parties on the left side of the political spectrum, i.e. within the Green Party and the Left party. The “work sharing through career interruptions” policy emerged during a bargaining episode with the minority coalition partner, the Green Party, explaining a somewhat anomalous outcome.

We now discuss the labor market consequences of the “work sharing through career interruptions” policy. Although most subsidized career interruptions in the Nordic countries are intended to fill a

specific need, such as parental leave, educational leave, sickness absence,..., we focus our discussion on the effects of the recently implemented work sharing leave scheme. The reason for this is twofold. First, its motivation as a work-sharing policy links it closely to the discussion elsewhere in this chapter. Second, due to its controversial motivation, it has been evaluated in great detail and we are thus able to present a number of results illustrating the labor market effects of reducing hours through subsidized absence schemes.

3. Labor market effects of alternation leave schemes

Proponents of work sharing schemes typically argue that restricting labor supply for some workers will generate employment for others (see the various models in the theory chapter of this book). The typical application of this policy tool, the case of France, is discussed in another chapter. Here we focus on the route chosen by Sweden (along with Finland and Denmark previously) where periods of leave are publicly subsidized and where the job is regained after the leave. The reforms were motivated by explicit work-sharing concerns since the replacement had to come from unemployment. Health, life time supply of labor, general welfare and gender equality were other explicit motivations for this program.

Obviously, work-sharing by means of subsidized absence is explicitly voluntary. Hence, the target of the policy is non-random. The people on leave choose to participate and are thus likely to come from groups with the strongest preference for participation. When employer consent is required, participants are taken from groups for which employers foresee a minimal amount of negative consequences from the absence. The people on leave are replaced by workers chosen among the unemployed (or even the long-term unemployed), i.e. from groups who should be in need of employment. As was seen in the theory chapter a crucial aspect for the effectiveness of work sharing policies is how wages react. Working time reductions that lead to increased labor demand may push up competition for workers and thus wages so that less employment is created. By targeting the demand for workers specifically towards the *unemployed* it is conceivable that the wage push effects are reduced. Thus, in theory, this construction could maximize the welfare gains and minimize negative consequences both for employed participants themselves and for jobseekers.

3.1. The alternation leave schemes

We refer to the absence subsidies implemented in Sweden, Finland and Denmark as *alternation leave* schemes borrowing this word from the Finnish system. Using a common term is not an

oversimplification since the systems have remarkably similar principles. The alternation leave grants subsidies to workers who temporarily interrupt their careers, if their employers agree to the leave and to hiring a previously unemployed substitute worker in their stead. If an employee receives the employer's acceptance, he or she may apply to the publicly funded subsidy during a specified period of time. If the application is granted, the person will receive a publicly funded benefit (related to, but lower than, the previous wage) during his or her leave. During the leave, the time can be spent as he or she wishes, working being the exception. The replacement worker, necessarily coming from unemployment, is paid a normal market wage.

The alternation leave scheme in Sweden ("Friåret") was first instituted as a pilot program in selected municipalities in February 2002 and implemented nationally from January 2005 on. The decision to institute the pilot and the later decision to extend the policy were the outcome of tough budget negotiations between the governing Social Democratic Party and its supporting parties the Left Party and the Green Party. The policy is one of the Green Party's leading policies and its implementation is seen as one of the great successes of their collaboration with the Social Democrats. The Green Party describes the policy as "...another policy for reducing unemployment and increasing life satisfaction."⁴ Since people on leave are replaced by unemployed workers, the policy is viewed by its proponents as an essentially self-financing reform. As noted earlier, the scope of the policy is not great, according to the estimates of the labor market board, the budget should suffice to pay for 14,000 leave spells annually, and it thus amounts to about half a percent's reduction in average working hours. Applications are granted as long as there are available funds within a predetermined budget at each responsible regional authority. Most of the 14,000 national slots were filled in 2005, the first year of national operation, although there were large differences between regions in the demand for the policy.

Finland currently has a career break policy ("Vuorotteluvapaa" or "Alterneringsledighet") very similar to the Swedish system both in construction and in the motivations. Finland created their alternation leave scheme as a temporary policy in January 1996.⁵ The scheme is formally still a temporary policy, even though it has been running for ten consecutive years. The current parliamentary decision is to run the scheme at least until the end of 2007. The original decision was the results of discussions between the social partners (unions, employers and the ministry of social affairs). The aim of the policy is to promote the ability of employees to cope with their jobs through short term absence from work, and at the same time improve the employment potential of unemployed jobseekers through fixed-term work

⁴ Quoted from the Green Party program (www.mp.se). Interestingly, the term "another" refers to a preceding discussion regarding a proposal to reduce working time to 30 hours per week.

⁵ See Nätti et al (1997a), Nätti et al (1997b) and Fröberg et al (2003).

experience”.⁶ There are no rules about what the person on leave is supposed to do (except not to work) and the substitute may be either short or long term unemployed. According to the current regulations, workers are entitled to a break if they have 10 years of employment (including parental leave) and at least one year with the same employer. The length of the leave is between 90 days and a full year. There were initial concerns because the take up-rate of the policy was too small; this was only true initially. Overall, 58,000 workers took part in the policy between 1996 and 2002. The magnitude of the current policy is at par with the Swedish case; around 11,000 participants start their leave every year.⁷

The first Nordic country to institute an alternation leave scheme was however Denmark in 1994. The policy (“Sabbatsorlov”) was instituted in high unemployment years (alongside with other career break policies) in order move labor demand from the employed wanting a break to the unemployed in want of work. The non-thematic break granted a leave if the worker was replaced by a *long term* unemployed worker. Remuneration was initially 80 % of UI-benefits, but was gradually reduced, and by 1999 it was 60 % of UI benefits. The take-up rate was considered low and the scheme was eventually abandoned in 1999 when labor market conditions had improved.

3.2. The absentees

As the different policies are constructed similarly, it is perhaps not surprising that the persons taking the breaks have similar characteristics in the different countries. In all the countries about 70 percent of participants are women, the mean age is around 45 and most come from the public sector. This seems to be generic facts that can be found in descriptions of participants in all the three countries.

⁶ See the Finnish “Act on Alternation Leave”, 1305/2002.

⁷ Ministry of Labor (2004).

Table 1: Who are the participants?

	Participants	All employed	Replacement workers	All registered at PES
Female	0.71	0.48	0.65	0.52
Not Nordic citizens	0.01	0.03	0.07	0.08
<i>Education</i>				
Less than secondary	0.20	0.17	0.14	0.27
Secondary	0.53	0.50	0.57	0.51
Tertiary	0.27	0.33	0.29	0.22
Disability			0.03	0.14
Age	44.5	41.2	34	37
Below 26	0.04	0.10	0.28	0.22
Above 55	0.23	0.18	0.06	0.14
Leave duration (mean)	300 days			
Leave duration (median)	364 days			
N	2,100	4,244,100	2,131	981,815

Numbers are for participants applicants to the Swedish career break pilot. Source: Fröberg et al (2003).

Table 2: What do they do?

	All	Women	Men	Applicants not receiving breaks
“Recreation”	0.55	0.53	0.59	0.02
Education	0.22	0.24	0.16	0.07
Child care	0.12	0.13	0.07	0.04
Care for other family member	0.03	0.03	0.02	0
Starting own company	0.06	0.03	0.13	0.03
Other	0.02	0.02	0.04	0.02

Note: Numbers are for participants applicants to the Swedish career break pilot. Source: Lindqvist (2004).

The results from Finland and Sweden are also quite similar when it comes to what the people on leave are doing while absent. Table 2 shows results from surveys of Swedish participants. By far most of the participants spend their time in some form of recreation, whereas around 22 % are in education and around 6 % are starting a new firm which is the only exception from the no-work rule. By comparing with a group of applicants not receiving the break (more on this below) we can get an idea of the deadweight losses of the subsidies. We can see that about one third of the education, and half of the new companies, would have taken place even without the subsidy.

A variety of reasons were given by the Swedish employers when asked why they allowed their employees to participate. The main reason however appears to be that they wanted to “accommodate the employee’s wishes” which was claimed by 67 % to be of “major importance” and by 28 % of “some importance”. In 9 cases out of 10 (according to both the employer and the employee) the employer did not ask how the leave was to be spent before granting it (Lindqvist, 2004).

The Swedish career break scheme was first implemented as a pilot scheme in 12 (out of 290) municipalities between February 2002 and December 2004, when it was turned into a national policy. During both the pilot and the national policy, the budget for granting policies has been set nationally but redistributed regionally according to the size of the labor force in each municipality. The pilot started on a very short notice (the decision was made in December 2001), and there was no consideration regarding what should be done if there were too many applications. This situation occurred quite rapidly in 10 of the 12 municipalities and the solution was to approve of applications as long as there were funds left according to the date of application (or the intended start date of the leave, this varied), and then they stopped. This created a situation where some of the applicants had their applications rejected simply because of lack of funds whereas other applicants had their applications approved.

As we show below, this situation provides tools for evaluating the consequences of the policy’s effects. Below we discuss evaluation results focusing on two different questions: First, what happens to future labor supply? Second, what happens to future wages?

The fact that parts of the applicants were rejected due to lack of funds provides an unusually good situation for studying the effects of career interruptions. However, it should be clear that this is not a randomized experiment – those are rare in social sciences. Some (one third) of initially rejected applicants were granted breaks later on (due to new funds) and the initial decision is therefore not an absolute determinant of participation. It is likely that those who applied for the new funds are a selected sample of those who were initially rejected. Therefore, we use the initial assignment as a predictor (or an “instrument”) for participation. As long as the initial assignment was not systematically in favor of those with good or bad expected outcomes this strategy gives us unbiased estimates of the effects of participation even if those that applied again are non-randomly selected.⁸ We discuss the credibility of this assumption below.

⁸ The only complication is if the effects vary between individuals, in this case the interpretation of the estimates are referred to as the Local Average Treatment Effect (LATE). In plain terms this means that our estimates are centred on those of the applicants who would take a leave if the initial application is granted, but not apply again if it was rejected. See Angrist (1994) for a discussion on these issues.

Comparing the background characteristics of approved and non-approved applicants show that there were some systematic differences depending on the time of application, most notably the people who applied early and thus were granted a leave were older more experienced and had longer tenure than those that applied too late.⁹ Differences in observed characteristics are not a problem *per se* since these can be accounted for in the empirical model, but they suggest that early and late applicants may differ in unobserved aspects as well. However, remember that the initial assignment was determined by a cut-off in the intended start date, where those coming before were approved. This means that any systematic differences between the groups must depend on time of application. Fortunately, we can control for such systematic differences by using the variation in intended start date within each group. Formally, we do this by including a linear control function in the intended start date. Since the cut-off time was different in each municipality we allow each municipality to have its own relationship between intended start date and outcomes. Note that the model only requires that systematic differences (that are not captured by observed characteristics) in expected outcomes are related to intended start date *between* the two groups (initially approved and rejected) in the same manner as they are *within* the groups. This assumption gets indirect support by the fact that nearly all pre-participation differences between the approved and rejected applicants disappears after including the linear terms. The only exception being the fraction of public employees (see the note under Table 3 for a list of the included covariates). More importantly, it is also shown that the outcome estimates in all cases are unaffected by the inclusion of this linear term and the observed background variables.

The results presented in Table 3 suggest no significant effects on future labor supply, except for a marginally significant increased propensity for early retirement for workers who were aged over 60 when applying. Presumably, workers of this age that were granted a break were reluctant to return to work with such a short period left to retirement. Most other estimates of the effects were negative (thus suggesting reduced future labor supply), but insignificant.

The results regarding wages are more clear-cut. The results suggest that wages were reduced by around 3 % when returning to work. This amounts to approximately the average nominal wage increase at the time. Although the samples are too small to allow for much heterogeneity analysis, estimates suggest that hourly wages were reduced more strongly for men. These negative wage impact estimates are completely in line with other studies of the effects of career interruptions, see e.g. Albrecht et al (1999). What is perhaps surprising is that a negative wage effect is found even for a group of workers who in general have characteristics that suggest small wage penalties (i.e. being old, female, in public sector, and in occupations with little wage dispersion).

⁹ The results are based on Lindqvist and Skans (2005) who used survey data on applicants collected by means of telephone surveys in October 2003 and February 2005. The first survey measured a number of background characteristics and the second survey looked at outcomes such as working hours and wages.

There are a number of theoretical reasons for why wages may be reduced when being away from work. Some are related to productivity, but others focus on “signaling” effects meaning that employers take experiences of career interruptions as a signal of low ambition. Although it is difficult to pinpoint the exact mechanisms behind the wage loss found above, it is unlikely that it can be attributed to signaling effects since both the accepted and rejected applicants announced to their employers that they wished to take a leave. It thus seems more likely that the wage loss can be attributed to a loss of productivity. This highlights a potential extra cost of work sharing through career interruptions, namely that work interruptions are likely to reduce productivity, whereas hours reductions well may lead to increased productivity as discussed elsewhere in this chapter and theoretically in our theory chapter.

Table 3: Instrumental variables estimates of labor market effects of pursuing a career break.

	Weekly hours worked	Retirement probability (full or part-time)	Hourly wages	Hourly wages
	All	Over 60	All	Men only
No controls	-1.674 (1.792)	0.212* (0.093)	-0.040* (0.016)	-0.036 (0.042)
Controls for covariates and linear term in application date	-1.465 (1.904)	0.218 (0.114)	-0.031* (0.015)	-0.078 (0.042)
N	1,605	270	1,375	283

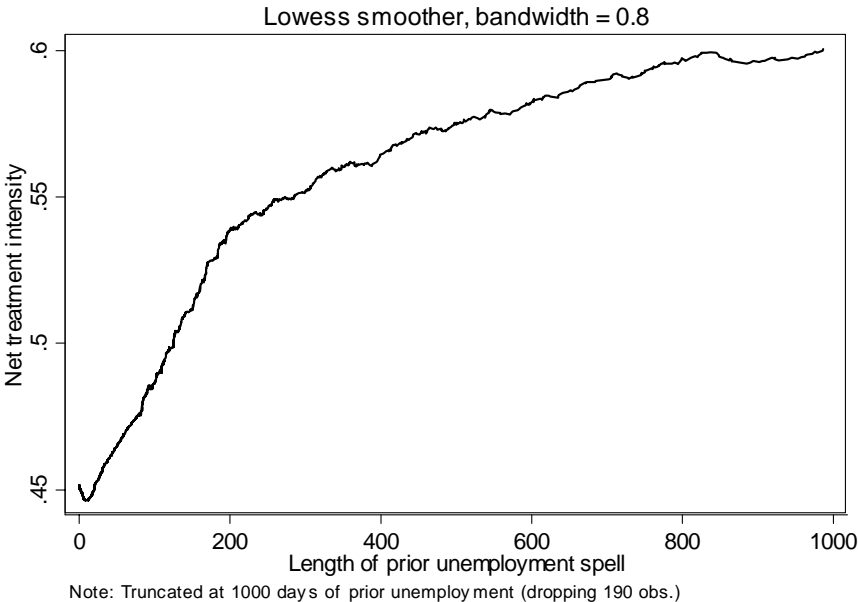
Note: The estimates are from Skans and Lindqvist (2005). Outcomes are measured 1-2 years after the end of the end of the (intended) break. All regressions control for municipality (12 dummies). Controls are a linear function of the intended start date interacted with municipality, age (with square and cube), gender, education (3 categories), experience, (and square), tenure (and square), dummies for part time and public employees, income (with square) unemployment, temporary employment and on the job search 2-years before application, marital status and having children. All variables refer to pre-application period.

3.3. The replacement workers

Replacement workers are rarely long-term unemployed. In Finland, two thirds of the replacement workers were unemployed for less than 3 months, and 12 percent only one day, in Sweden 17 % were unemployed less than one week before starting their replacement contract (Fröberg et al, 2003). Replacement workers quite often appear to be selected among workers who have been on temporary contracts earlier on at the same employer. Employers also specifically value a short unemployment history.

To formally analyze the expected counterfactual outcomes of the replacement workers during the their replacement contracts Larsson and Skans (2004) match the applicants to similar job seekers (similar in terms of unemployment history and basic demographic characteristics) in the same municipalities before the policy was instituted. The estimates suggest that the replacement workers would have been employed about half the time the of the replacement contract, had they not received it. This “deadweight loss” is estimated to have been substantially smaller, had the program been restricted to long-term unemployed, basically reflecting the fact that the outflow from unemployment is lower for the long term unemployed. The results are shown in Figure 1 below.

Figure 1 Net treatment intensity (treatment minus estimated deadweight loss) and prior unemployment (N=1847). Source: Larsson and Skans (2004).



Those who were rejected as applicants to the Swedish career breaks were never assigned a replacement worker. Thus, there is no similar “quasi-experimental” control group available for studying how the replacement workers careers were affected by receiving the replacement contract. In order to evaluate the long run effect of the policy, Larsson et al (2005) compares replacement workers with a matched sample of non-participants with identical observed characteristics and labor market history.

The results presented above suggest that the career break replacement workers are often selected from a pool of workers with experience of temporary jobs. In an attempt to account for the selection, replacement workers are compared to other job seekers with similar characteristics. The paper uses register data from the administrating authority (the Public Employment Service, PES), an adequate

data source since only individuals registered with the PES were eligible to be replacement workers. The unemployment history of each individual is divided into a sequence of three periods: 0-3 months, 4-12 months, and 13-48 months before start of the replacement contract. The periods further back are longer under the assumption that there is more information in the details of the more recent events. Each of the periods is characterized as being spent in unemployment, in a temporary job, in a mix of these, not registered, or in a mix of all of these.¹⁰ In addition, workers are categorized by their registration status within the unemployment register at the time of the start of the contract or in the 1st of each month for potential comparisons (5 registration categories) and some basic demographic characteristics. The comparison group is created using “exact” matching between the replacement workers and other unemployed workers in the participating municipalities, meaning that each replacement worker is compared to (all) workers with exactly the same values of on these constructed characteristics. The point of using exact (rather than e.g. propensity score) matching is that all characteristics are interacted so that comparison workers have a reasonably similar previous *sequence* of labor market histories. The assumption underlying the causal interpretation of the estimates we provide below are that individuals who resembles the replacement workers in these aspects will provide an unbiased projection of what would have happened to the replacement workers had they not received the replacement contracts.

Results from are shown in Table 4. These suggest that the replacement contracts reduced the future unemployment risk of the replacement workers. During the year after the replacement contract when the outcomes are studied, the effect amounts to about 23 days, or about 30 %. The combination of a small reduction in the number of days and a large percentage effect reflects the fact that the replacement workers are estimated to have been unemployed for 77 days during the year in the absence of a replacement contract. Further estimates study the sum of unemployment and temporary jobs, finding that the effects are of a similar relative size (26 percent). It is worth noting that both treated and controls spent as much time in temporary jobs as in unemployment during the time following the treatment, further suggesting that the participants were selected among a pool of “professional” temporary workers. Larsson et al (2005) also attempts to assess if the effects are larger for replacement workers with a weak or with a strong attachment to the labor market. The pattern is however inconclusive.

Overall the results suggest that the replacement workers do improve their labor market situation because of the contract, but as can be expected from the short prior unemployment duration, the effect is not large as measured in days. It should be noted that the identification strategy used to identify whether replacement workers improved their labor market status rests on the assumption that they

¹⁰ All categories use a 90 percent cut-off. Thus, unemployed is if unemployed more than 90 % of days etc.

were not selected on unobserved characteristics which in themselves affect the outcomes. If this assumption is not valid, the estimates will be biased. Given that firms are involved in the selection of workers it is more likely that this bias is positive, and that the results thus overestimate the positive effects of the contracts but since the results suggest such small effects (in days), this problem does not seem to be of great concern. Unfortunately, there are no studies of how replacement workers for other types of career interruptions affect the replacement workers but it is likely that the selection in these cases are even less favorable to the long term unemployed since these policies do not put any restrictions on who the employer should to select as a replacement worker. However, studies of temporary contracts in other countries (e.g. Zijl et al, 2004 for the Netherlands) and results for subsidized employment in Sweden (Forslund et al, 2004) all point to positive effects; the conclusion of small but positive effects for the replacement workers therefore seems reasonable.

Table 4: Estimated labor market effects of receiving a replacement contract.

	Replacement workers	Comparison workers	Treatment effect	Effect in percent
Days of unemployment 13-24 months after start	54.3	77.2	-22.9 (2.06)**	-30
Days of unemployment or temporary job 13-24 months after start	114.8	154.9	-40.1 (2.64)**	-26

Note: The estimates are from Larsson et al (2005). Comparison workers are selected among other unemployed in the same region through exact matching on age (4 groups), gender, citizenship (Swedish, Nordic, Other), Education (3 levels), Season (3 quarters), UI benefit category (full, base amount, no), job search area (extended or not) and one of 625 different possible labor market histories (see Larsson et al, 2005, for details).

3.4. Welfare

The alternation leave policies were multi-purpose policies not only motivated by the labor market effects. The health and well-being effects of career breaks have been tentatively evaluated by the National Institute for Working Life (2006) and some results are presented below.¹¹ 88 percent of participants report an increase in general well-being during the career break (2 percent report a reduction). 60 percent report improved relationships within the family. The study also reports that half of the respondents claim to have improved their exercising practices and one third claims that their

¹¹ The report builds on essentially the same data (the telephone surveys were collected simultaneously) as in Lindqvist and Skans (2005) except that it does not include a control group in the analysis. Estimates of health and wellbeing are based on self-assessed changes.

eating habits were improved. This is taken as evidence that career interruptions lead to improved health-related behavior.¹² The same variables are studied for the replacement workers, with similar although less clear results. This group also reports a large improvement in general well-being, but much less improvements (and more negative cases) in relationship and health-related behavior.

Table 5: Self assessed health related effects of the career break scheme.

	Improved	Unchanged	Worsened	N
<i>Workers on leave</i>				
General well-being	88	11	1	1470
Relationships to family members	59	39	2	1469
Exercise habits	48	48	4	1470
Eating habits	30	67	3	1469
<i>Replacement workers</i>				
General well-being	46	44	9	1170
Relationships to family members	18	72	10	1170
Exercise habits	26	64	10	1169
Eating habits	22	68	10	1169

Note: The results are from ALI (2006). They are based on self-assessed changes in telephone interviews.

Overall, the results suggest that both groups feel that participation in the program improves general well-being. This is hardly surprising, given that participation was voluntary (although, as with any job offer, there could be benefit sanctions for unemployed who refused to participate in the program).

4. Conclusions

The Swedish experience suggests that centralized unions don't necessarily promote work sharing as a policy. This may be explained by macro oriented unions willingness to accept restructuring and destruction of employment in low productive sectors as a means for increasing overall productivity. Although neither work-sharing nor working time reductions in general have been prominent policy tools in Sweden, actual hours are reduced through the use of subsidized absence policies. These policies are likely to reduce the need for working time reductions by providing other means for

¹² The report also studies changes in a number of illnesses such as muscle aches, sleeping problems etc. For all of these illnesses the people on leave report substantial improvements, but since the questions are asked conditional on having the problems initially and there is no counterfactual estimate, these estimates should be treated with care.

combining family and careers. As suggested by the theory section, a high value of home production is likely to increase demands for working time reductions. Subsidies of absence at strategic points in time which reduce the value of home production in general may therefore be policy substitutes for working time reductions.

We have also shown that although subsidized career interruptions may appear to be an attractive alternative work-sharing policy, it is not likely that such policies have beneficial labor market effects. We have shown results of the effects of a career break policy specifically aimed at creating employment for the unemployed. The presented evidence shows that the labor market effects for the people on leave are negative. The policies were popular among women in the public sector who are slightly older than the median worker, and in professions with low wage dispersion. In spite of this self-selection, workers taking career breaks are subject to wage losses after returning to work. Since the estimates are measured relative to other individuals who also received employer consent for taking a career break, it is likely that the wage loss is due to reduced productivity rather than due to a signal of low ambition. There is no evidence of increase in labor supply after the breaks.

The effects for the replacement workers are positive but small. The replacement workers are mainly picked from the short term unemployed and workers coming from other temporary work contracts. Thus, even though these policies were specifically constructed so as to generate employment for those in most need of employment, this does not appear to be the case. Overall, the results suggest that the career interruption policies are not a reasonable route when trying to create employment. Combining job creation for the long term unemployed and the requirement of employer consent are contradictory requirements. This is clearly illustrated by the lack of interest for the Danish policy, which required long term unemployed replacement workers, and the difficulties of finding long term unemployed replacement workers in Finland and Sweden despite the attempts and policy goals. On the other hand, if the policies were altered and did not require employer consent, the employers' willingness to hire groups more likely to participate in the program could be reduced. This would probably lead to increased gender inequality since employers would be increasingly reluctant to hire or promote women.

The program however did have positive welfare impact for its participants. The results thus suggest that, out of the three possible motivations for career break policies (consumption of leisure, reduced unemployment, and increased labor supply in the future), leisure is the most important. Since the main positive effects from this type of work sharing policies stems from personal well being, the message from Sweden is clear and simple. The manipulation of working hours should be treated as a classical static labor supply tradeoff between leisure and work, but not as a policy that will help in fighting

against unemployment. Now, this leaves open the question of whether or not governments should subsidize the consumption of leisure.

Chapter 5: Work-sharing, part-time employment and childcare

1. Introduction

This chapter gives an overview of how work-sharing was implemented in the Netherlands. It will show that its employment effects were limited. However, we will also show that work-sharing in the early 1980s was also responsible for the unprecedented level of part-time employment in the Netherlands.

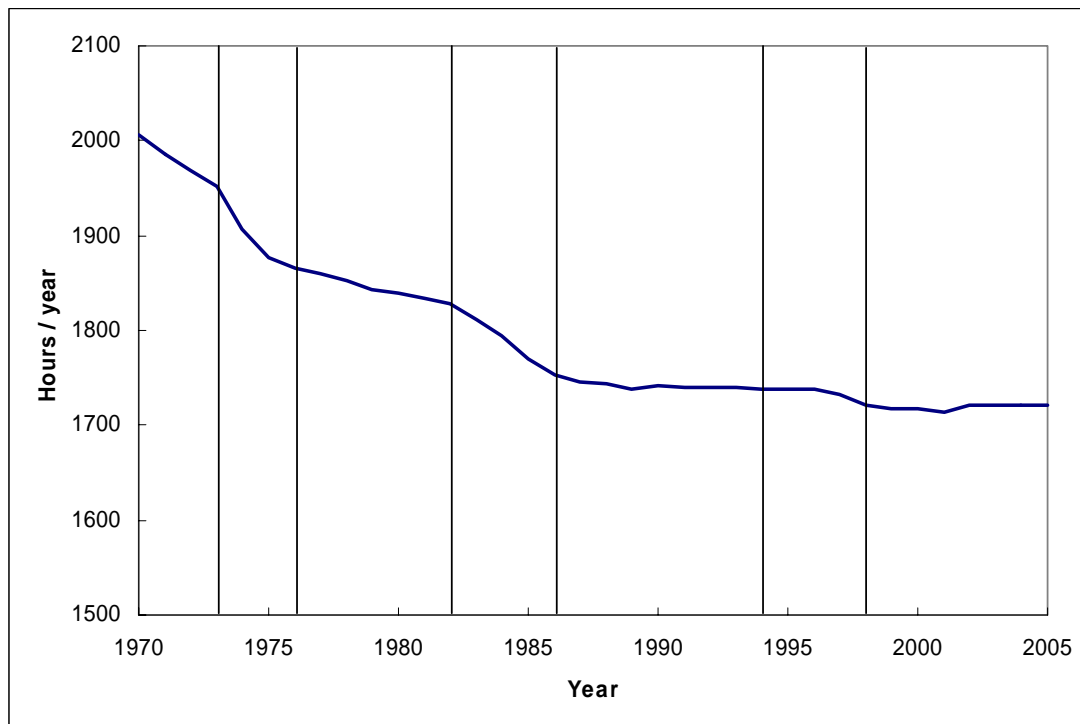
This chapter is organized as follows. First, we discuss how work-sharing was implemented in the Netherlands. Then, we move to a discussion of the employment effects of work-sharing. In this section we explicitly focus on the effects that work-sharing had on part-time employment. Part-time employment is closely linked to female participation. The next Section shows how labor force participation is influenced by public policy and social values. We end this chapter with concluding remarks.

2. Work-sharing in the Netherlands

In this section we present an overview of the way working time was reduced over the period going from 1970 to 2005. Figure 1 shows how contractual hours¹ evolved in the Netherlands. Since 1970, (contractual) working time of a full-time employee has gone down from 2007 hours per year to 1720 hours in 2005. With respect to working time reduction, three important periods can be distinguished, i.e. 1973 – 1976, 1982 – 1986 and 1994 – 1997.

¹ Contractual working hours are exclusive of holidays and days offs due to shorter working hours.

Figure 1 Working hours of a full-time employee (hours / year)



First of all, it is important to note that employers' and employees' representatives decide together what should be contractual working hours within collective agreements. These negotiations take place at the sector level. The government only determines the "upper bounds", i.e. the maximum number of hours per day and the maximum number of days per week that are allowed. When negotiations take place at the industry level, the theory chapter tells us that work-sharing should be less preferred than when negotiations are centralized.

During the 1970's, the law (originating from 1922) stated a maximum of 8 hours per day, 6 days a week, therefore a 48 hour working week. However, in 1972, employers' representatives and unions agreed to reduce the working week to 40 hours per week and to work at most 48 weeks per year. One of the reasons for this reduction was the increase in unemployment during the early 1970's. Between 1973 and 1976, contractual hours indeed decreased to 40 hours per week and weeks worked to an average of 46 weeks per year.

In the early 1980s a recession started to put pressure on wages. Firms were faced with excess capacity. Unions were willing to reduce working time, however only in combination with constant weekly or monthly wages. This would have resulted in increasing labor costs, something the employers were strongly opposed to. Moreover, the employers were looking for more flexible ways to employ their workforce.

Unions and employers then reached the now famous Wassenaar agreement (1982), agreeing to reduce working time in combination with wage moderation. More precisely, unions agreed to give up the

inflation automatic adjustment of wages. Working time reduction in the Wassenaar agreement was defined in a broad sense, it included shorter working weeks, more holidays, early retirement but also promotion of part-time employment. The choice should depend on unions preferences as well as workers preferences (see theory chapter).

In industries with excess capacity, working time reduction was mostly implemented by increasing the number of holidays. In combination with wage moderation this reduced capacity without massive lay-offs. As a result of the Wassenaar agreement, between 1982 and 1985 the working time of a large majority of Dutch workers was reduced.

During the period 1986 – 1993, no further reductions in working time took place. This period was also the start of an economic upswing, and firms were not in favor of further reducing their production capacity. Moreover, unions were not in favor of further working time reductions either, being disappointed by the perceived limited employment effects of working time reduction (see below).

In the early 1990s, in many collective agreements the working week was shortened in exchange for vacation days, leaving the number of hours per year unchanged. This shorter working week mainly served an organizational purpose: during the economic upswing that took place after 1986, operating hours of firms increased without increasing working hours. The large number of days off (as a result of the working time reductions) prevented firms from further increasing their operating hours. By this tradeoff, a reduction in the number of hours per week against flexible hours, firms could more easily adjust and expand their operating hours.

Between 1994 and 1997, in many collective agreements employers' representatives and unions agreed to reduce working hours to 36 hours, in return for flexible use of these hours and a lower overtime premium.

Flexible use of hours means that normal hours can be between 7am and 7pm or 9pm. Or, it may also mean that these 36 hours per week are an average number, enabling firms to employ their workforce for more hours in some weeks, as long as the average number of hours during, for example, a year does not exceed the agreed upon number of hours.

The next section discusses the employment effects of work-sharing in the Netherlands.

3. The impact of work-sharing on employment

The expected positive employment effects have played an important role in the negotiations on working time reduction between unions and employers' representatives. In particular during the recession of the early 1980s, preservation of employment was an important aim of unions.

Tijdens (1998) and De Lange (1988) report that only a small percentage of the hours' reduction after

1982 was used to hire new workers (25 – 40%). They point at productivity gains and business cycle effects (excess capacity of firms) to explain this. Working time reduction was primarily used to reduce excess capacity. In 1984, over 50% of the firms with less than 100 employees in the market sector combined working time reduction with a reduction in operating hours.

However, the fact that working time reduction was used to reduce production capacity does not preclude positive employment effects (*ceteris paribus!*) of work-sharing. As indicated by the theory chapter of this book, the impact of working time reduction on employment crucially depends on the effect of the reduction in hours on the hourly wage and on the use of overtime, as well as the objectives of the union.

For the Netherlands, Dur has analyzed the first two effects (see Dur, 1997 and 1999). Regarding overtime, he finds that actual hours move in the same direction as contractual hours. This finding is in line with results for other countries, such as Germany (Hunt, 1999).

With respect to hourly wages, Dur (1997) estimates a wage equation using data over the period 1965 – 1993 on Dutch wages and contractual hours. He finds that a 1% reduction in contractual hours leads to an increase in the hourly wage rate of circa 0.40%. This effect mitigates possible positive employment effects of working time reduction.

Kapteyn, Zaidi, and Kalwij (2004) analyzes the resulting employment effects of working time reduction. They use a panel of 16 countries over the period 1960 – 2001 to estimate the long-run relationship between working hours, employment, and wages. Correcting for business cycle effects (GDP per capita), inflation, and population growth, they find that a 1% decrease in working hours lead to an increase in hourly wages of 0.46%. This result is in line with what Dur (1997) found for the Netherlands. Moreover, Kapteyn et al. find a positive, albeit small and insignificant effect of working time reduction on employment: a 1% reduction of working hours leads to a 0.16% increase in employment.

The positive effect of work-sharing on wages is probably the major reason why Kapteyn et al. find a non-significant (positive) effect of working time reduction on employment. They conclude that work-sharing is not an efficient way to increase employment.

4. Work-sharing and part-time employment

The Wassenaar Agreement did not explicitly specify the way in which working time was to be reduced. Several options were mentioned, for example, part-time employment. As explained repeatedly, the choice will depend on various factors with sometimes opposed effects.

In the Netherlands, as noted above, the choices that were made differed widely across industries. In

the market sector most firms hit by negative shocks reduced both working time and operating time to decrease their production capacity. In industries that were not (or to a lesser extent) hit by the economic downturn (such as banking and health care) and in industries employing many women, emphasis was put more heavily on individual working time reduction, i.e. part-time employment. In a number of Collective Agreements, workers got the right to reduce their working hours on an individual level, i.e. work-sharing through part-time employment. Between 1980 en 1984 the number of part-time jobs in the manufacturing and service industries increased from 132,000 to 829,000.

However, unions were opposed to part-time employment. In 1981, the main federation of unions (FNV) emphasized the inferiority of employment rights, wages fringe benefits, and career prospects in part-time jobs and the lack of union membership by part-time workers was also emphasized. The federation did not want to help create a secondary job market and demanded first an improvement in the statutory protection of part-time workers (Visser and Hemerijck, 1997).

However, the increased level of labor force participation of women gave them a stronger voice in the unions. And these women turned out to have a strong preference for part-time employment (see below). It is striking in this respect that the first union to give part-time employment more prominence on the policy agenda was the union for workers in health care and education, i.e. with a large fraction of part-time working, female members.

Employers did not oppose part-time employment, mostly because it attracted new applicants, it could also prevent skilled female workers from leaving, and it was helpful in scheduling personnel, in particular to accommodate peak hours in production.

During the second half of the 1980s, the government, unions, and employers started negotiating over working conditions and entitlements of part-time workers. Between 1990 and 2000, many collective agreements stated a right to part-time work unless going strongly against the firm's interest (70% of the collective agreements in 1996, compared to 23% in 1990). In 2000, this resulted in a Law in which all workers in The Netherlands were entitled to part-time work. The employer could only oppose this right for "compelling business reasons".

That the Netherlands are nowadays called the first part-time economy of the world can be traced back to the Wassenaar Agreement, in which the individual option to reduce hours was adopted. However, the increase in part-time employment also has a lot to do with women catching up on their labor force participation. For a long time, Dutch female participation levels were relatively low compared to other European countries. The next section gives an overview of factors explaining these levels, i.e. the provision of childcare and the public opinion on female labor force participation.

5. Childcare provision, public opinion and participation

Until the 1960s, childcare was non-existent in the Netherlands. There was a strong focus on family values, including that women should stay at home, fostering their children. Single females working in government jobs and in some large firms were even fired as soon as they got married. Childcare was only provided on a kind of welfare basis for women who needed to work and therefore could not look after their children.

In the 1960s, things started to change. First, new educational insights stated that it was beneficial for children to meet and interact with other children. Second, women started to emancipate. Finally, in the 1960s there were labor shortages. These shortages were so large, that even though public opinion was still strongly opposed to employment for married women, firms started recruiting amongst this group of workers. Such firms were found mostly in the manufacturing and health care industries. These firms started providing childcare facilities themselves. However, by the end of the 1970s, these facilities had disappeared together with the labor shortages. Importantly, there was no State interference during this period.

The 1970s were characterized by increasing emancipation, stating the need for economic independence of women. However, these were still views of a minority, meeting a lot of resistance. Moreover, the discussion on the provision of childcare facilities mainly focused on the educational aspects (i.e. on the needs of the child rather than the needs of the mother).

Nevertheless, by the end of the 1970s, the public opinion slowly moved towards “the needs of the mother”, acknowledging that women could also benefit from childcare facilities. Emancipation was then more prominent on the political agenda, leading to subsidized childcare facilities. Unions and employers’ organizations did not step in, considering that the provision of childcare remained a responsibility of the individual households.²

In the 1980s, the phenomenon of working mothers became more prevalent and the public opinion no longer opposed working mothers.

To illustrate how the public opinion on working mothers evolved over time, we use data taken from the “Cultural Change in the Netherlands” Survey conducted by the Social and Cultural Planning Office of the Netherlands. This survey started in 1975. Periodically around 2,000 households are interviewed and asked to give their opinion on family life matters, among others. We use figures reported in SCP (1998, p. 141). In particular, SCP reports the opinion of respondents aged between 17 and 70 on two topics, i.e. working outside the house by married women with school-going children and by married women if this means that their children have to go to daycare. There are three possible

² Note that during this period there were no labor shortages.

answers: recommendable, not troublesome and troublesome. The following two figures show the percentages in each answer category over the period 1965 – 1997.³

Figure 2

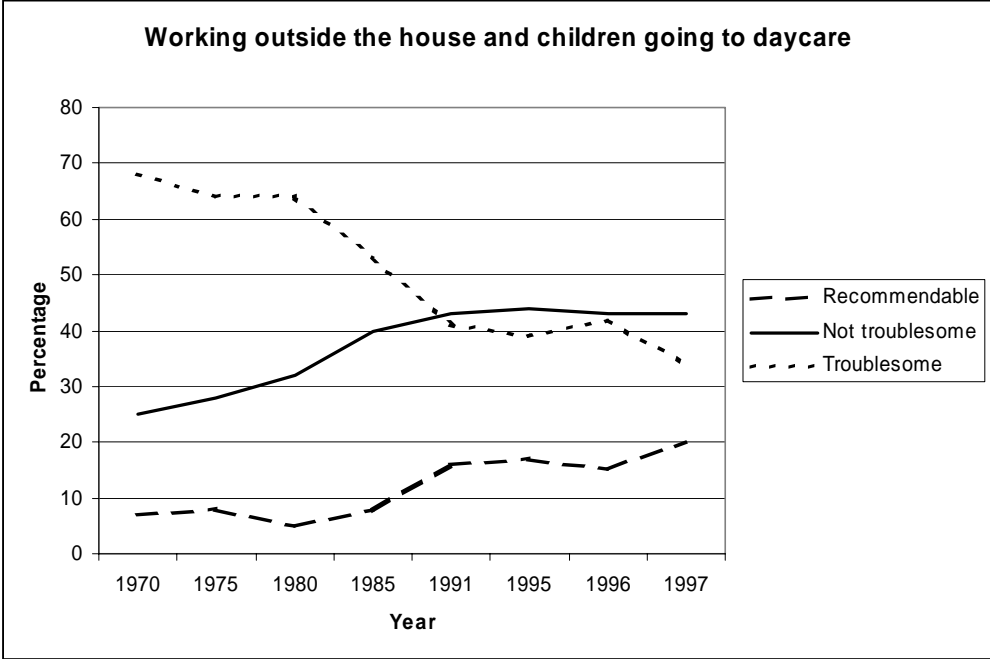
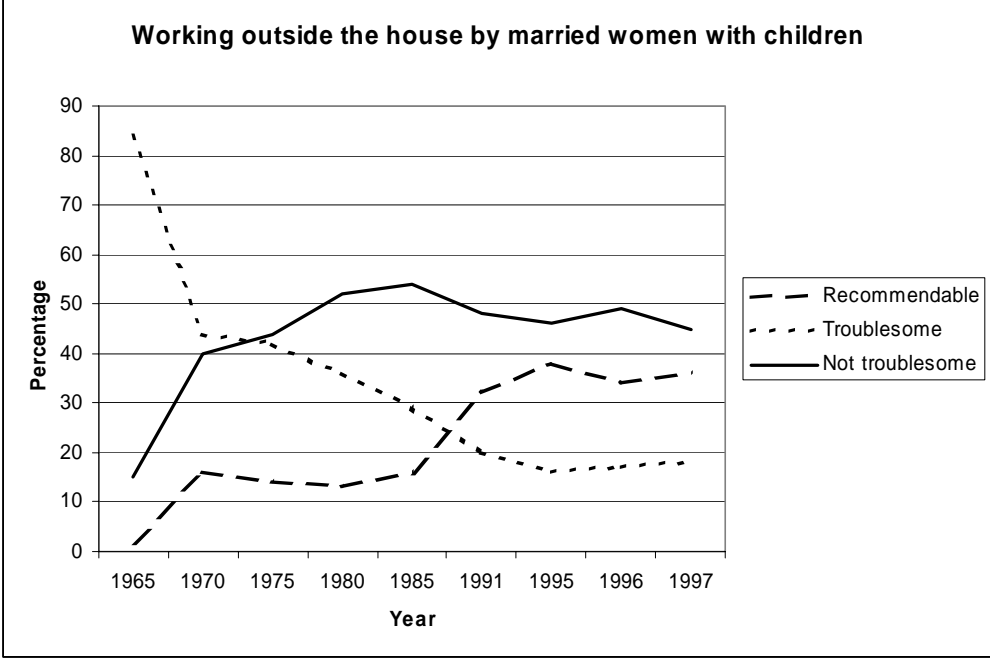


Figure 3



³ The figure for 1965 is derived from a survey preceding the “Cultural Change in the Netherlands” survey.

Striking is that until 1985, around 30% of the respondents were opposed to married women with school going children working outside the house. In case of women with younger children this percentage was still 50% in 1985. After 1985, the public opinion starts to shift towards approval: in 1997, only 18% is opposed to married women with children working outside the house (while 36% recommends it). However, the age of the children matters a lot. If they need to go to daycare, in 1997 still 34% of the respondents is opposed to married women working outside the house.

To put these figures in international perspective, we use the data from the World Values Survey.⁴ The first wave of this survey was held around 1981. In this year, unfortunately, the questions on family life cover a limited range of topics. The next two tables show the opinion on the ideal number of children and on the statement that in an ideal marriage, husband and wife share the household chores.

Table 1: Opinion on the ideal number of children in %, 1981

	<i>Netherlands</i>	<i>W-Germany</i>	<i>France</i>	<i>Denmark</i>	<i>Sweden</i>
1	3	6.2	1.8	2.6	3.0
2	50.1	52.2	43.9	50.7	58.3
3	22.8	18.1	40.2	23.0	24.3
4	9.7	4.4	5.8	5.0	4.4
5	0.9	0.9	1.4	0.9	0.7
6 or more	1	0.3	0.6	0.3	0.2
don't know	0	0	0	0	9.0
Missing	12.5	17.9	6.2	17.5	0
N	1,221	1,305	1,200	1,182	954

Striking in this table is the difference in preference for 4 or more children in the Netherlands, compared to W-Germany, France and Sweden.⁵ Almost 12% of the Dutch respondents indicated 4 or more children as ideal, compared to circa 6% in W-Germany, Denmark and Sweden.

This could loosely be interpreted as a preference for family life and looking after children. The results for the question on sharing household chores is in the next table, columns showing the percentage of respondents per answer category.

⁴ Data obtained from www.worldvaluessurvey.org, accessed on March 31st, 2006.

⁵ Striking also is the very high fraction wanting 3 children in France.

Table 2: Opinion on how successful a marriage is in which household chores are shared between husband and wife (%), 1981

	<i>Netherlands</i>	<i>W-Germany</i>	<i>France</i>	<i>Denmark</i>	<i>Sweden</i>
Very	29.1	20.4	33.9	46.4	34.4
Rather	38.9	36.8	43.4	38.7	45.7
Not very	29.2	40.5	20.8	11.7	19.6
Don't know	0	0	0	0	0.3
Missing	2.9	2.3	0.8	3.1	0
N	1,221	1,305	1,200	1,182	954

In this table we have on the one hand France, Denmark, and Sweden who appear to have an “emancipated” view of a successful marriage in which husband and wife share the chores, and, on the other hand, the Netherlands and W-Germany in which a much smaller group (70% in the Netherlands, 60% in W-Germany) shares this opinion.

Therefore, the 1981 wave of the World Values Survey illustrates that the Netherlands around 1981 was not a country with a strong focus on female labor force participation, compared to other countries.

As the public opinion during the 1980s moved towards more female participation, demand for childcare increased. The government (headed by the Christian-Democratic party) still considered the provision of childcare as being of the responsibility of the parents and introduced tax exemptions. However, during the second half of the 1980s, public policy (geared towards increasing labor force participation) recognized that sufficient provision of daycare was a necessary condition for women to participate! The Ministry in charge of these questions was no longer the ministry of Welfare, but the ministry of Social Affairs and Employment, i.e. from 1986 onwards, the “economics dimension” of childcare provision became central. This was also the time when the unions and the employers’ organizations started to get involved. Women increasingly asked employers to accommodate their wish to keep working after giving birth (albeit part-time) by providing childcare facilities.

Table 3, taken from Tijdens and Houweling (1993), shows a strong preference of working mothers for informal childcare arrangements and part-time work in the 1980s. By the end of the 1980s, of the group of women that continued working after giving birth, over 50% decreased the number of hours in combination with an informal care arrangement.

Table 3: Type of childcare arrangement chosen by women (younger than 30) after the birth of their first child

<i>Arrangement</i>	<i>1979 – 1981</i>	<i>1982 – 1984</i>	<i>1985 – 1987</i>
Wasn't working	26%	25%	29%
Working same number of hours +			
informal care	6%	8%	7%
formal care	1%	2%	2%
Working fewer hours +			
informal care	5%	8%	12%
formal care	1%	1%	2%
Stopped working	61%	55%	46%
Total	100%	100%	100%

Source: Statistics Netherlands, sample of 500 women.

These results are in line with the general picture that emerges from the literature (references in Tijdens and Houweling). The large majority of women wanted either themselves or their partner to participate in caring activities, in order to minimize the need for others to help. In addition, another group is strongly in favor of children growing up in a familiar environment (i.e. care given by close relatives). A third group also prefers care in a “family like” environment, but chooses external care and, finally, a fourth group that prefers day care.

This picture again emerges in Portegijs et al. (2006). This study is a survey under 1,600 mothers with children aged between 0 and 12. It focuses on mothers' opinion on childcare facilities in general, the use they make of them, the availability, and the associated cost. The central question is: which factor is most important in explaining the choice of a particular childcare arrangement, the lack of supply, the cost, or preferences.

Concerning the use of childcare facilities, of all Dutch households with children, in 2004, 61% did not use any formal or informal type of arrangement. So, still a majority of households chooses to look after their children by themselves.

Of the households who use one or more types of childcare facilities, more than 66% uses only informal types of care, i.e. care given by grandparents, by other family, friends, or a babysitter. Only 13% of these households use only formal types of care such as daycare centers. For both formal and informal types of childcare it turns out that the use is limited to an average of 1.5 to 2.5 days per week. This again confirms that Dutch households (women) prefer to look after children themselves. And when they decide to call upon others for help, they preferably ask (close) relatives.

However, these results might have been driven by the lack of supply of other arrangements. However, the part on opinions on childcare in Portegijs et al. (2006) shows that even in times of ample supply, women show a strong preference for informal care arrangements.

When explaining the choice for a particular childcare arrangement, it turns out that preferences are the most important factor. Moreover, they find that two-thirds of mothers are actually working, 20 hours per week on average, while the father is working full-time. The respondents (mothers) indicate that this situation satisfies their needs. If people use childcare facilities, it is on average for 2 days per week. Almost all respondents indicate that parents should not use childcare facilities for more than two days. This final result supports the view that irrespective of the available child-care facilities, Dutch women want to work part-time, some kind of intrinsic motivation.

This is also illustrated by the 1990 wave of the World Values Survey. In this wave respondents are asked whether they agree with the opinion that a working mother can establish just as warm and secure a relationship with her children as a mother who does not work. The next table presents the results. Again we see that the Netherlands together with W-Germany has the smallest percentage of people strongly agreeing.

Table 4: Degree of agreement that a working mother can establish just as warm and secure a relationship with her children as a mother who does not work (%), 1990

	<i>Netherlands</i>	<i>W-Germany</i>	<i>France</i>	<i>Denmark</i>	<i>Sweden</i>
Agree strongly	29.4	8.4	39.5	51.5	44.9
Agree	40.4	30.7	32.7	30.2	26.7
Disagree	23.3	46.6	22.2	15.2	17.1
Strongly disagree	5.1	7.9	4.3	1.8	9.5
Don't know	1.8	6.3	1.3	1.2	1.8
Missing	0	0.1	0	0.1	0.0
N	1,017	2,101	1,002	1,030	1,047

The difference between the Netherlands (and W-Germany) on the one hand and Denmark, France and Sweden on the other, is much more striking when looking at the degree of agreement to the statement that both husband and wife should contribute to household income.

Table 5: Degree of agreement that both husband and wife should contribute to household income. (%), 1990

	<i>Netherlands</i>	<i>W-Germany</i>	<i>France</i>	<i>Denmark</i>	<i>Sweden</i>
Agree strongly	8.3	11.3	35.9	28.0	58.7
Agree	20.9	43.9	40.8	38.5	26.2
Disagree	57.0	28.9	16.9	23.8	7.8
Strongly disagree	11.5	2.1	2.2	3.6	4.4
Don't know	2.3	13.5	4.2	6.0	2.9
Missing	0	0.2	0	0.1	0
N	1,017	2,101	1,002	1,030	1,047

Almost 70% of the Dutch (strongly) disagree to this statement, compared to only 12,2% in Sweden.

Summarizing (see also Plantenga, 1994), until the early 1970s a large share of public opinion favored family values, in particular that women should take care of children. This limited the provision of formal childcare facilities. During the 1970s and early 1980s, things started to change, for instance due to increased levels of education, a decreasing number of children, and changing relative wages. This fuelled female participation. However, Dutch values are still much more geared towards women taking care of the family than for instance those expressed in Scandinavian countries.

Taken altogether, this has led women to favoring part-time employment, because part-time employment not only reduces the need for childcare facilities, it also allows Dutch women to take care of their children by themselves or, sometimes ask their close relatives to do so.

6. Conclusions

Between 1970 and 2000, working hours have gradually decreased in the Netherlands. The reduction was partly due to the reduction in contractual weekly hours of work for full-time employees. Empirical evidence shows that this slightly increased the hourly wage and (therefore) only had a very limited (not significantly) positive employment effect.

However, from the early 1980s, reduction of individual working time (i.e. part-time employment) was widely viewed as a means of work-sharing. In combination with Dutch women having a relatively strong preference for combining care for their families with working outside the house, this fuelled an increase in part-time employment. This then led public institutions to becoming favorable to part-time employment, inducing further growth of part-time employment.

Chapter 6: Summary

Unemployment has been a problem in all European countries, not always but at least at some point in time between 1974 and 2006. It still is in some large countries such as France, Germany, Italy, or Spain. But, it was in Sweden, the Netherlands, sometimes for some short period time over the last thirty years. Interestingly, different solutions were engineered across countries. Some relied on features of the education system; the German apprenticeship program was widely seen as one. Not any more. The Germans are rethinking their approach in the face of persistent unemployment. Some relied on more “market-based” solutions: United Kingdom or Ireland are the best examples. Others relied on a mix of market incentives and State-provided insurance mechanisms. The famous Nordic “flexicurity” model is attracting lots of attention from other European countries trying to reform their malfunctioning labor market and unemployment insurance system. Finally, some countries pooh-poohed the Anglo-Saxon market-based approach, and went their own way without solving their unemployment problem. France is a prominent example in this last category.

Interestingly, most countries mentioned just above have tried at some point to include work-sharing in their package of solutions. Some, such as the Netherlands, implemented work-sharing (in the form of part-time work) in the eighties. Others, such as Sweden, implemented career break programs. Finally, France or Germany tried to decrease the working week for all or most of their firms.

In this book, we propose an overview of work-sharing in its various guises as implemented within Continental Europe. We also provide some reasons for the various choices of these different countries as well as an evaluation of the success of these strategies. Let us summarize these findings.

As theory tells us (Chapter 1), work-sharing is rarely good for employment and the conditions that make work-sharing a possible policy are rarely met in practice. Indeed, the first and central message of the country studies can be clearly phrased: *in no country work-sharing per se has created employment*. Many reasons can be invoked. In particular, wages responded to workweek reductions. In all countries that implemented hours reductions, monthly wage compensation mechanisms were put in place, mostly under the pressure of unions. Even when wage subsidies and other incentives were offered, the increase in hourly wages resulting from wage compensation always mitigated the potential (short-term) effects of hours reduction. For instance, in France, there was an explicit wage compensation mechanism maintaining monthly pay, and because firms went to 35 hours at different moment in times and under different regimes (laws), in 2002 multiple minimum wages were prevailing for the firms under the differing regimes. These minima eventually converged in 2005 to a unique value, the highest

within this multiplicity. In Germany and in the Netherlands empirical evidence show that hourly wages increased.

The second central message that can be derived from the country studies can also be clearly expressed: *in all countries there were and there still are forces pushing for some form of work-sharing*. But the exact implementation is an equilibrium phenomenon that largely depends on a complex set of factors ranging from institutions, the size and international positioning of the country (contrast Sweden, a small open country, and France, a much bigger one with ambiguous feelings vis-à-vis globalization), the centralization or decentralization of union-firms bargaining (see Germany, with industry-level bargaining, versus France, with relatively weak unions), family preferences (see the Netherlands, where a significant fraction of citizens prefer women taking care of children, and contrast with Sweden, where men are virtually mandated to take parental leaves). The impact of work-sharing on productivity should be a central concern of governments when wanting to implement a reduction in hours. It should be central because high-productivity firms export, innovate, train, and, maybe more importantly, grow i.e. hire workers. The country studies show that it was not always the case in the past. For instance, in France, reduction in hours is associated with decreasing productivity. And, by contrast, West-German firms that increase hours have (mildly) increasing productivity. Maybe even more troublesome is the death process apparently associated with workweek reduction when firms' productivities are affected in a world of global competition. This fact is the explicit reason for Swedish unions refusing any reduction of the workweek: international competitiveness does not allow any manipulation of hours. And, the same time Swedish unions who had preferences for shorter hours pushed for career breaks who have essentially no impact for the long-term unemployed. A final and interesting message that springs from this book is the value of theory. *Theory is really helpful*. It is able to illuminate both the reasons for adopting a work-sharing strategy, the shape this strategy takes (part-time, more vacation, less hours,...), and the consequences of work-sharing.

Can we derive policy recommendations from the results obtained in the country studies? At this point in the book, it would be ridiculous not to give it a try, even just a small try.

Productivity of firms engaged in international competition, either in manufacturing or in service industries, is key. All empirical studies produced in the last ten years, be it in telecommunications (Olley and Pakes) or in the retail industry, prove repeatedly this statement. In addition, productivity growth in most industries is due to less productive firms dying more productive firms entering. *All workweek reductions that were implemented, most clearly in France, induced decreasing productivity for affected firms*. This cannot be good. Firms must be productive, they must increase their productivity. This is the route to success. The Swedes had it right. The German hours reductions were negotiated, firms took their own risks. The French hours reductions were not. Firms died, but not

necessarily those that were about to die had the “normal” Schumpeterian “creative destruction” process unrolled without government intervention. Clearly a bad outcome for the French economy.

Now, workers may well be entitled to work less, sometimes for one month (this is usually called vacation), sometimes for one year (sabbaticals), or for one hour. Reasons for this abound. Retraining, raising children, starting a new firm, doing music, shopping, etc. The multiplicity of cases is daunting. *No government is or will be able to forecast all potential and specific individual situations.* The resulting outcome for society is not necessarily clearly positive. The Swedish or the Dutch experience tell us that the gains may not be huge but also that the potential losses will not be huge either. In other words, the risks are low, most particularly in contrast to a more interventionist strategy, because the impact on a society are likely to be massive, totally unpredictable, and likely to be detrimental to the weakest (less skilled, less trained, ...). The country analysis shows that schedules became more irregular in France because of workweek reduction.

It seems that economies that did best had no revolution, no “grand soir”, but continuous incremental changes, all the more accepted by society that they were discussed, negotiated with legitimate partners able to understand the stakes, even more so when the stakes were high. As high as unemployment in some unfortunate European countries.

References

- Albrecht J W, Edin P-A, Sundström M and S Vroman (1999), "Career Interruptions and Subsequent Earnings: A re-examination Using Swedish Data" *Journal of Human Resources*, 34, s294-311.
- Alesina, G., Glaeser, E. and Sacerdote, B., (2005), "Work and Leisure in the U.S. and Europe: Why So Different?" *NBER Macroeconomic Annual*, 2005, forthcoming.
- Algan, Y. and Cahuc, P., (2006), "The Roots of Low European Employment: Family Culture?", forthcoming in Pissarides, C. and Frenkel, J. (eds.), *NBER Macroeconomics Annual*, 2005, MIT Press.
- Andrews, M.J., Schank, T., Simmons, R. (2005), 'Does worksharing work? Some empirical evidence from the IAB-establishment panel', *Scottish Journal of Political Economy*, 52(2), 141-176.
- Askenazy, P., (2004) Shorter Work Time, Hours Flexibility, and Labor Intensification, *Eastern Economic Journal*, vol. 30, pp. 603-614.
- Becker, G., (1965), "A theory of the allocation of time," *Economic Journal*, 75, pp. 493-517.
- Bender, S., Haas, A., Klose, C. (2000), 'IAB Employment Subsample 1975-1995', *IZA Discussion Paper* 117, Bonn.
- Bispinck, R., 1997, 'Deregulierung, Differenzierung und Dezentralisierung des Flächentarifvertrages. Eine Bestandsaufnahme neuer Entwicklungstendenzen in der Tarifpolitik', *WSI-Mitteilungen*, 50/8, 551-561.
- Bispinck, R., 1998, *Arbeitszeitkonten. Ein Überblick über ausgewählte tarifliche Regelungen, Informationen zur Tarifpolitik*, WSI, Düsseldorf.
- Blanchard, O., (2004), "The Economic Future of Europe", *Journal of Economic Perspective*, 18.
- Blundell, R. and MaCurdy, T. (1999), "Labor supply : A review of alternative approaches," in Ashenfelter, O. and Card, D. (eds), *Handbook of Labor Economics*, Elsevier Science Publisher, vol 3A, Chap 27.
- Bosch, G., 1990, 'From 40 to 35 hours. Reduction and flexibilisation of the working week in the Federal Republic of Germany'. *International Labour Review*, 129(5), 611-627.
- Cahuc, P. and F. Postel-Vinay, 2005, "Social Status and the Overworked Consumer", *Annales d'Economie et de Statistique*, vol 78, pp. 143-61.

- Cahuc, P. and Zylberberg, A. (2004), *Labor Economics*, MIT Press.
- Cahuc, P., (2001), "Les expériences françaises de réduction du temps de travail : moins d'emplois et plus d'inégalités", *Revue Française d'Economie*, vol 15, n°3, pp 141-166.
- Calmfors, L. and Hoel, M. (1988), "Work sharing and overtime", *Scandinavian Journal of Economics*, 90, pp. 45-62.
- Calmfors, L., Driffill, J. (1988). 'Bargaining Structure, Corporatism and Macroeconomic Performance', *Economic Policy*, 6, 13–61.
- Chiappori, P.-A., (1992), "Collective labor supply and welfare," *Journal of Political Economy*, 100, pp. 437-467.
- Crépon, B., Leclair, M., and Roux, S., (2004), "RTT, productivité et emploi: nouvelles estimations sur données d'entreprises", *Economie et Statistique*, No 376-377, pp. 55-90.
- d'Autume, A., (2001), "Réduction du temps de travail et innovations organisationnelles négociées", *Revue d'Economie Politique*, vol 111, pp. 785-792.
- Dreger, C., Kolb, J. (1998), 'Keine Beschäftigungseffekte durch Verkürzung der tariflichen Wochenarbeitszeit', *Wirtschaft im Wandel*, 4(12), 12-17.
- Dreger, C., Kolb, J. (1999), 'Generelle Verkürzung der Wochenarbeitszeit verdrängt ungelernete Arbeitnehmer', *Wirtschaft im Wandel*, 5(12), 3-6.
- Dur, R. (1997), "Arbeidsduurverkorting en lonen in Nederland (in Dutch)", *Economisch Statistische Berichten*, vol 82, pp. 71-73
- Dur, R. (1999), "Arbeidsduurverkorting en overwerk (in Dutch)", *Economisch Statistische Berichten*, vol 84, pp. 75-77
- Edin P-A and R Topel (1997) "Wage Policy and Restructuring: The Swedish Labor Market since 1960", in R. Freeman, R. Topel and B. Swedenborg (ed.) *The Welfare State in Transition*, Univeristy of Chicago Press, 1997.
- European Industrial Relations Observatory (EIRO) on-line, various issues.
- Feil, M., Schröder, M. (2002), *Die Auswirkungen der Arbeitszeitverkürzung in Deutschland*, Institut der Deutschen Wirtschaft, Köln.

- Forslund A. (1997) "The Swedish model - past, present and future", in H Giersch (ed), *Reforming the Welfare State*, Springer Verlag
- Franz, W., Smolny, W. (1994), 'Sectoral wage and price formation and working time in Germany: An econometric analysis', *Zeitschrift für Wirtschafts- und Sozialwissenschaften*, 114, 507-529.
- Freeman, R.B. and Schettkat, R., (2005), "Marketization of household production and the EU--US gap in work", *Economic Policy*, 41, pp. 5-50.
- Fröberg D, L Lindqvist, L Larsson, O N Skans and S Ackum Agell (2003) "Friåret ur ett arbetsmarknadsperspektiv - delrapport 1" IFAU Rapport 2003:7, IFAU, Uppsala.
- Gersbach, H. and Haller, H., (2005), "Beware of Workaholics: Household preferences and individual equilibrium utility", IZA discussion paper No. 1502.
- Gianella, C. and Lagarde, P. (1999), "Productivity of hours in the French Manufacturing Sector", document de travail No G9918, Insee.
- Greenwood, J., Seshadri, A. and Yorukoglu, M., (2005), *Engine of Liberalization*, *Review of Economic Studies*, 72, pp. 109-133.
- Hamermesh, D. and Trejo, S. (2000), "The demand for hours of labor: Direct evidence from California", *Review of Economics and Statistics*, 82.
- Hart, R. (1987), *Working time and employment*, Boston: Allen and Unwin.
- Hibbs D., and H Locking (1996), "Wage Compression, Wage Drift and Wage Inflation in Sweden", *Labor Economics*, 3.
- Hunt, J. (1999) "Has work-sharing worked in Germany?" *Quarterly Journal of Economics*, 114, pp 117-48.
- Hunt, J. (1999), 'Has work-sharing worked in Germany?', *Quarterly Journal of Economics*, 114, 117-148.
- Hunt, J. (1999), "Has work-sharing worked in Germany?" *The Quarterly Journal of Economics*, pp 117-148.
- Kapteyn, A., A. Kalwij and A. Zaidi (2004), "The myth of work-sharing", *Labour Economics*, vol 11(3), pp. 293-313
- Koch, S., 2001, 'Arbeitszeitkonten stabilisieren die Beschäftigung', IAB-Kurzbericht No. 4, Nürnberg.

- Kölling, A. (2000): 'The IAB-Establishment Panel', In: Schmollers Jahrbuch. Zeitschrift für Wirtschafts- und Sozialwissenschaften, Journal of Applied Social Science Studies, 120(2), 291-300.
- König, H., Pohlmeier, W. (1989). 'Worksharing and factor prices: a comparison of three flexible functional forms for non-linear cost schemes', Journal of Institutional and Theoretical Economics, 145, 343–57.
- Lange, W. de (1988), "De balans van ATV (in Dutch), "Tijdschrift voor arbeidsvraagstukken, vol.4 (3) pp.54-64
- Larsson L, and O N Skans (2004) "Early indication of program performance: the case of a Swedish replacement contract" IFAU WP 2004:7, IFAU, Uppsala.
- Larsson L, Lindqvist L, and O N Skans (2005) "Stepping-stones or dead-ends? An analysis of Swedish replacement contracts" IFAU WP 2005:18, IFAU, Uppsala.
- Lindqvist L (2004) "Deltagare och arbetsgivare i friår försöket" IFAU Rapport 2004:6, IFAU, Uppsala.
- Lindqvist L, Larsson L, and O N Skans (2005) "Friårets arbetsmarknadseffekter" IFAU Rapport 2005:10, Uppsala.
- Malmberg J, Byrgren M, and M Hansson (2003) "Kartläggning av arbetstidsförkortningar 2000-2003. Arbetslivsrapport Nr 2003:15, Arbetslivsinstitutet, Stockholm.
- Manning, A., (2001), Monopsony in Motion, Imperfect Competition in Labor Markets, Princeton University Press.
- Marimon, R. and Zilibotti, (2000), "Employment and distributional effects of restricting working time", European Economic Review, vol 44, pp. 1291-1326.
- Ministry of Labor (2004), Annual Report of the Finnish Ministry of Labor, 2004.
- Müller-Jentsch, W., Ittermann, P. (2000), Industrielle Beziehungen: Daten, Zeitreihen, Trends, 1950-1999, Campus, Frankfurt.
- National Institute for Working Life (2006) "Friårsprojektet: Upplevd livskvalitet, välbefinnande och hälsa hos friårslediga och deras vikarier", Arbetslivsinstitutet, Stockholm.

- Nilsson C. (1993) "The Swedish Model: Labor Market Institutions and Contracts" in J. Hartog and J. Theeuwes (eds) *Labor Market Contracts and Institutions: A Cross-National Comparison*. Amsterdam, North Holland.
- OECD (2003), "Employment in Europe 2003" *Employment and European Social Affairs*, OECD, Paris.
- OECD (2005), "OECD Economic Surveys, Sweden", *OECD Country Reviews*: Paris.
- Pissarides, C., Garibaldi, P., Olivetti, C. and Wasmer, E., (2004), "Women in the labor force: How well is Europe doing?" in T. Boeri, D. del Boca and C. Pissarides (eds.), *European Women at Work*, Oxford University Press.
- Plantenga, J. (1994), "Deeltijdarbeid als emancipatiestrategie (in Dutch)", *Economisch Statistische Berichten*, vol 78, pp. 373-376
- Portegijs, W., M. Cloin, I. Ooms and E. Eggink (2006), "Hoe het werkt met kinderen – moeders over kinderopvang en werk (in Dutch)", *Sociaal Cultureel Planbureau*, Den Haag.
- Promberger, M., Rosdächer, J., Seifert, H., Trinczek, R. (1996), *Beschäftigungssicherung durch Arbeitszeitverkürzung: 4-Tage-Woche bei VW und Freischichten im Bergbau: Mehr als zwei Beispiele*. Sigma, Berlin.
- Rocheteau, G., (2002), *Working Time Regulation in a Search Economy with Worker Moral Hazard*, *Journal of Public Economics*, vol 84, pp. 387-425.
- Rogerson, R., (2003), "Structural Transformation and the Deterioration of European Labor Market Outcomes", Working paper, Arizona State University.
- Rosen, S. (1968), "Short run employment variation on class-1 railroads in the U.S., 1947-63", *Econometrica*, vol 36, pp. 511-529.
- Rosen, S. (1974), "Hedonic Prices and Implicit Markets," *Journal of Political Economy*, vol 82, pp. 34-55.
- Rosen, S. (1986), "The Theory of Equalizing Differences," in Ashenfelter, O. and Layard, R. (eds), *Handbook of Labor Economics*, Amsterdam, North Holland: Elsevier SciencePublisher, vol 1, chap 12, pp. 641-692.
- Ruhm C J (1998) "The Economic Consequences fo Parental Leave Mandatates: Lessons from Europe" *The Quarterly Journal of Economics*, Vol. 113, No. 1. (Feb., 1998), pp. 285-317.

- Schank, T. (2003), The impact of working time on employment, wages and productivity, Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit, Nürnberg.
- Schank, T. (2006), 'Have employees in Germany received full wage compensation after a cut in standard hours', *Manschester School*, 74(3), 2006.
- SCP (1998), "Sociaal en Cultureel Rapport 1998. 25 jaar sociale verandering (in Dutch)", Den Haag, Elsevier Bedrijfsinformatie.
- Seifert, H. (1991), 'Employment effects of working time reductions in the former Federal Republic of Germany', *International Labour Review*, 130(4), 495-510.
- Skans O N (2004) "The impact of working-time reductions on actual hours and wages – evidence from Swedish register-data", *Labor Economics*, vol 11, s 647-665
- Skans O N, and L Lindqvist (2005) "Causal effects of subsidized career breaks" IFAU WP 2005:17, IFAU, Uppsala.
- SOU (2002), "Arbetstiden – kortare arbetstid eller mer ledigt" Skrift Nr 3, Kommittén för nya arbetstids- och semesterregler (Knas). SOU 2002:12.
- Steiner, V., Peters, R. (2000), 'Employment effects of work sharing — an econometric analysis for West Germany', Discussion paper 00-20, ZEW, Mannheim.
- Stigler, G. (1946), "The Economics of Minimum Wage Legislation", *American Economic Review*, vol. 36, pp. 535-543.
- Tijdens, K. (1998), "Zeggenschap over arbeidstijden (in Dutch)", Welboom, Den Haag.
- Tijdens, K. (2002), "Arbeidsduurverkorting en het Akkoord van Wassenaar. Via deeltijdarbeid en verlofsparen naar de CAO à la carte (in Dutch)", "Tijdschrift voor arbeidsvraagstukken, vol.18 (4) pp.309-318
- Tijdens, K. and J. Houweling (1993), "Geschiedenis van de kinderopvang (in Dutch)", in: K. Tijdens and S. Lieon (ed.), "Kinderopvang in Nederland – organisatie en financiering", Uitgeverij Jan van Arkel, Utrecht.
- Visser, J. and A. Hemerijck (1997), "A Dutch miracle, job growth, welfare reform and corporatism in the Netherlands, Amsterdam, Amsterdam University Press.
- Zilj M, van den Berg G J and A Heyma (2004), "Stepping-stones for the unemployed: the effect of temporary jobs on the duration until regular work" IFAU Working Paper 2004:19.