ARE EUROPEANS LAZY?
OR AMERICANS CRAZY?

edited by Tito Boeri, Michael C. Burda,
and Francis Kramarz

WITH

Pierre Cahuc, Bruno Crépon, Daniel S. Hamermesh,
Oskar Nordström Skans, Thorsten Schank,
Gijsbert van Lomwel, Philippe Weil and André Zylberberg
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Contributors

Alberto Alesina (Harvard University)
Tito Boeri (Fondazione Rodolfo Debenedetti and Bocconi University)
Olivier Blanchard (Massachusetts Institute of Technology)
Michael C. Burda (Humboldt Universität zu Berlin)
Pierre Cahuc (ENSAE, France)
Bruno Crépon (ENSAE, France)
Daniel S. Hamermesh (University of Texas at Austin)
Francis Kramarz (ENSAE, France)
Steve Nickell (Bank of England and London School of Economics)
Giuseppe Nicoletti (OECD)
Christopher Pissarides (London School of Economics)
Oskar Nordström Skans (IFAU-Institute for Labour Market Policy Evaluation)
Thorsten Schank (Universität Erlangen-Nürnberg)
Guido Tabellini (Bocconi University)
Gijsbert van Lomwel (CentER, Tilburg University)
Jan van Ours (Tilburg University)
Philippe Weil (ECARES, Université Libre de Bruxelles)
André Zylberberg (CNRS and École Polytechnique)
Introduction

In the last 50 years the gap in labour productivity between Europe and the US narrowed down considerably. Hourly labour productivity in manufacturing was about 50 per cent of US productivity at the end of the 1950s according to the statistics assembled by the Groningen Growth & Development Centre. By 2005, the EU-US labour productivity gap had declined to about 5 per cent. Yet, average per capita income in the EU is still about 30% lower than in the US. As income per capita is given by the product of hourly labour productivity and the number of hours worked per person, the persistent gap in income per capita can be almost entirely explained by Europeans working less than Americans. In Europe there are indeed both relatively less people at work (a lower employment to population ratio) and less hours worked per worker than in the US.

Why do Europeans work so little? What do they do of the time they spare from (market) work? Can they be induced to work more without reducing labour productivity? If so, how? And would welfare increase when policies rewarding market work with respect to other potentially socially valuable activities, like childbearing, are adopted? More broadly, should the state interfere at all with employer-employee and within family bargaining over working hours?

The extensive literature on Transatlantic differences in labour market outcomes can only partly address these issues as it has devoted most of its attention to US-Europe unemployment differentials and adjustments along the extensive margins of labour force participation. However, a key difference in the evolution of hours per capita between the US and Europe is related to the evolution of hours per worker, that have been falling dramatically in Europe since the 1950s, outpacing developments in the US. The pace of yearly hour reductions per workers in the 1950-75 was twice as large in the UK (averaging -11 hours per year) than in the US (-5.5).

The purpose of this volume is to address these differences in the adjustment along the intensive margin of hours worked per person in employment, investigating the allocation of time between market and non-market activities, as well as the effects of the policies which imposed working hours reductions in
many European countries. As in previous books for the Fondazione Rodolfo Debenedetti, this volume assembles contributions from two teams of leading scholars in the field. Part I presents the contribution of the first team, which was co-ordinated by Michael Burda and included Daniel Hamermesh and Philippe Weil. Part II collects the report of the second team, led by Francis Kramarz and including Pierre Cahuc, Bruno Crépon, Oskar Nordström Skans, Thorsten Schank, Gijsbert van Lomwel and André Zylberberg.

The first part of the book focuses on time use, notably on the borders between market and household production. It documents cross-country and cross-gender differences in time allocation and provides explanations for this heterogeneity in terms of culture and social norms. The second part of the book dwells on collective dimensions of working hours reductions, notably on the effects of mandatory reductions in hours of work introduced in Europe in the 1970s and the 1980s. It suggests that these policies contribute to explain the widening US-Europe gap not only in hours per worker, but also the differences in employment to population ratios as mandatory reductions in working hours are found to be responsible for the destruction of many jobs.

The final section of the volume addresses, in light of this evidence, the most fundamental issue as to whether the state should at all interfere with time allocation, by imposing restrictions on working hours.

This introduction offers a succinct literature review enabling the reader to better connect the two parts to previous work in this area.

**Are Europeans Lazy?**

Various explanations have been provided for the US-Europe differences in hours worked.

An influential paper by Olivier Blanchard (2004) suggested that Europeans choose to work less than Americans because they value leisure time much more than their counterparts on the other side of the Atlantic. According to this view, it is a matter of taste or preferences: Europeans are just lazier than Americans. As they attach a higher value to leisure, they are willing to trade income with leisure time.
The policy implication of this view is that Europeans should not worry too much about the income gap with the US, simply because GDP per capita is not the right measure to compare welfare across the two sides of the Atlantic. Nor should Europeans worry about the fewer hours worked, since that is their choice. On the contrary, pity the Americans who don’t understand what is really valuable in life. Consistently with this view, Blanchard proposes in his insightful remarks at the end of this volume to adjust income measures in order to take into account of the value of leisure time. And, his, albeit admittedly rough adjustment of income per capita to leisure and home-production, narrows down considerably the gap in incomes per capita between Europe and the US. Data from various waves of the World Value Survey on self-reported measures of life satisfaction lend some support to Blanchard’s view, which was recently echoed also by Alesina (2005). The countries with the longest hours of work typically display the lowest subjective measures of life satisfaction (Oecd, 2006).

Another interpretation offered for the Transatlantic differences in hours worked is that Europeans have the same preferences than Americans, but are discouraged from working by high taxes on labour. In particular, Prescott (2004) estimated that almost 100 per cent of the differences in hours worked between the US and France, on the one hand, and US and Germany, on the other hand, can be traced to differences in the incidence of taxation. Intuitively, one hour of work is taxed at rates of 50% in Europe compared with about 30% in the US, and buys much fewer consumption goods. Similar conclusions were reached by Davis and Henrekson (2004), who explicitly considered also the option of going shadow, that is, working in the flourishing informal sector of many European countries in order to avoid paying payroll taxes.

There has been a heated debate about the magnitude of the labour supply elasticity implicitly posited by Prescott. Ragan (2005), in particular, pointed out that a pure tax effect cannot account for the large number of hours worked in Nordic countries, suggesting that other factors, such as public expenditure on child, day and elder care are at least as important as taxes in explaining the allocation of time between market and non-market activities. More broadly, it is not simply a matter of labour/leisure choice. A key dimension which cannot be neglected is the margin between home and market activities.
Or are Americans Crazy?

An important contribution offered by the first part of this volume is indeed in going beyond the leisure work trade-off framed by Blanchard and Prescott. When not involved in market activities, individuals, in addition to spending time in leisure, can carry out a number of secondary activities (substituting market work offered by third parties) or even tertiary activities, which cannot be contracted out. The allocation of time across the two sides of the Atlantic can be better characterized by drawing on cross-country comparable Time Use Surveys (TUS), decomposing the use of time in the day before the interview in the last 20 years. If one pools together market work and secondary activities, measured by the TUS, into an “all work” category, as done by Burda, Hamermesh and Weil (BHW henceforth), one observes that Americans do “all-work” more than the Europeans.

This finding casts some doubts on yet another interpretation for the Transatlantic differences in hours worked which had recently been put forward by the literature, namely the so-called marketisation hypothesis (Freeman and Shettkat, 2005). According to Freeman and Shettkat, the total amount of hours devoted to market work or marketable activities, the “all-work” category defined by BHW, should be the same across the two sides of the Atlantic as Americans “marketwise” the secondary activities carried out by the Europeans, e.g., they hire someone to do house cleaning rather than doing it on their own. Their conclusion is in line with previous work by Olovsson (2004), who found that Swedes work 120 hours per year less than Americans, but devote almost 110 hours more time than their US counterparts to unpaid work. Thus, the difference in “all work” between Sweden and the US is negligible, a bit less than one percent.

BHW consider a larger set of countries than Olovsson (France, Germany, Italy and The Netherlands, in addition to the US) and find that more market work in the US is far from being compensated by less home work than in Europe. Also Ragan (2005) had found that more unpaid work in Europe can only partly compensate (about one third of it) for the difference in market work vis-à-vis the US. This is bad news for the pure marketisation hypothesis. It is bad news also for the interpretation offered by Prescott. If the problem is labor taxes, then Europeans’ total work should be the same as Americans’ while it is less.
The key factor behind these workholic attitudes of Americans is their capacity to spread working time over the entire week and over the 24 hours. As extensively documented by BHW, working time of Europeans is much more concentrated both across the days of the week and within each day. This finding can be reconciled with yet another view of the marketization hypothesis which was recently put forward by Rogerson (2007): high taxes may have also prevented the development in Europe of a large market service sector, which in turn makes it more difficult (and costly) to substitute home with market work. Germans, for instance, spend time preparing their own meal rather than going to restaurants as these are more expensive than in the US.

From a normative standpoint, the fact that Americans work on weekends or more often at odd hours of the day may not be an outcome which maximize their welfare. It may also be an aggregate outcome that no individual agent can improve upon—and would certainly not wish to deviate from—given what all others are doing. As pointed out by BHW, social norms and other externalities may push the market equilibrium substantially away from the social optimum.

**Collective vs. individual choices**

Overall, neither the pure Panglossian, lazy Europeans, view of Transatlantic labour market differences, nor the pure tax on market work interpretation offered by Prescott survive to a careful reading of the new data on the allocation of time, analysed in detail in the first part of this volume.

In order to explain differences in hours worked, one should perhaps extend the standard neoclassical labour supply model in unchartered lands. Not only, it is necessary to account for home production and tertiary activities, but also for the fact that there is a collective dimension of decisions about hours worked. Taxes themselves, after all, are set within a collective choice mechanism: even buying Prescott’s story, it leaves unsettled the issue of why European choose to pay so high taxes on labour.

More importantly still, in Europe it is not the single individual to decide how many hours to allocate to market work per week. In most of the cases, it is possible to choose whether or not to work, rather than how much time to devote to work. Contrary to the US, in most European countries there are legal maxima to the total amount of work (normal plus overtime hours) and working time is tightly regulated rather than settled in the context of plant-level or individual bargaining.
An illustration of the importance of collective choice mechanisms in explaining Transatlantic differences in hours worked, comes by analyzing the subcomponent of the labour force who can freely choose how many hours to work per day, namely the self-employed people. While employees work substantially less in the EU-15 than in the US, the asymmetry goes in the opposite direction when we concentrate on the self-employed. This fact may be affected by self-selection: it is possible that all workholic Europeans are forced to be self-employed by working time regulations setting legal maxima to hours of work. Yet, the findings of larger number of hours worked in Europe than in the US among the self-employed survives to controls for a number of individual characteristics (gender, age, educational attainment) which are likely to be correlated with preferences about working time.

Another (and more compelling) indication that working hours are driven by collective decisions comes from women labour force participation. Women experience a higher incidence of part-time in Europe. In fact, the decline in hours per worker experienced by some European countries in the 1990s – e.g., Netherlands, Ireland and Germany – reflects an increased participation of women. Before the spread of part-time, working mothers were often forced outside market work in countries where the supply of child care remains essentially a responsibility of the individual household. This is still the case: while in Germany employment rates of women are comparable to those in the US, German mothers have significantly lower employment rates than their American counterparts.

An indication of the fact that collective decisions are not yet adequately taking into account the needs and aspirations of women is the fact that they “all-work” more than men in Southern Europe. Put another way, if they were allowed to choose the amount of market work, they would probably work less to compensate for the time-consuming activities that they carry out at home. Another interpretation of these gender differences is that women have a low bargaining power within the household and hence end up working more than their husbands. However, Burda, Hamermesh and Weil show that in Italy not only married women, but also unmarried women work more than men.

**The role of unions**

All these facts suggest that the European peculiarities have much more to do with public policies than with free individual choices.
What type of collective decision making process is taking place in Europe on working time?

In many cases it has been the collective bargaining system to impose reductions of working time. As documented by Booth (1995), stronger union membership historically has gone hand in hand with lower working hours. This suggests that stronger bargaining power of workers has paid out not only in terms of higher wages, but also of less hours per worker.

In other cases, it has been the Government to introduce mandatory restrictions to working time, either by extending erga omnes the coverage of collective agreements on working hours, or ruling independently of collective agreements, even against the requests of the unions.

**Legislated reductions in working time**

Part two of this volume reviews evidence on the effects of these legislated reductions in working hours. It initially provides a simple, but sufficiently flexible, framework to analyse the effects of legislated working time reductions on employment, wages and labour productivity, and then uses this analytical framework in reviewing evidence on working time reductions in France, Germany the Netherlands and Sweden.

The main finding of this part of the report is that work-sharing is rarely good for employment as hourly wages tend to increase (as in Germany and the Netherlands) after workweek reductions, in order to preserve monthly wages. Even when wage subsidies and other incentives to working time reductions were offered (as in the very complicated 35 hours regimes introduced by Martine Aubry in France), the increase in hourly wages always prevented any potential (short-term) positive effect of hours reduction on employment headcounts.

Yet, in several countries there are still forces pushing for some form of working time reduction. There can be indeed several good reasons to reduce working time, even though it does not create jobs. Retraining, raising children, planning the startup of your own business, are all worthwhile activities
that cannot be done under very rigid working time regulations for dependent employment. As our lives are getting longer, it may also be a good idea not to concentrate everything – career plans and family responsibility – in the central ages of our life. One may wish to take a break from work and then come back to it with a renewed human capital and enthusiasm.

But all of these reasons are clearly dependent on personal circumstances. Some workers may need work interruptions lasting one hour, others one month or even one year. This heterogeneity in preferences about working time reductions makes a centralized, collective decision making process untenable in implementing changes in working time. As documented by the country case studies collected by Kramarz, Cahuc, Crépon, Nordström Skans, Schanks, van Lomwel and Zylberberg working time reductions have less unintended consequences when they follow a negotiated, evaluated, and consensual route at the decentralized level.

Also increases in working time are likely to be more successful in preserving headcount employment levels and avoiding large falls in labour productivity when introduced in the context of firm-level bargaining (as in the cases of the Daimler Chrysler and VW agreements, reviewed in Chapter Two of the second part of the volume). All grand strategies are doomed to failure or, at least, they entail large risks of reshuffling economic welfare of large portions of the population in totally unpredictable and unintended directions.

**Do we need regulations on working time then?**

Summarizing, Europeans work less than Americans mainly because there are institutions inducing or altogether forcing them to do so. If this is true, then Europeans can be induced to work more or less by reforming these institutions. Whether this is good or bad cannot be established a priori, as some working time reductions or, at least, more flexibility in the allocation of time over the life course can leave room for a large number of worthwhile activities, including the retraining required to preserve our human capital at longer ages. For this very reason, it is certainly not a good idea to implement working time reductions uniformly across the board on a centralized fashion as there is a large and increasing heterogeneity in the way in which individuals would react to such changes and, more broadly, would like to allocate their time outside market work. By imposing the same allocation to
everybody there is a high risk of obtaining unintended consequences and raising unemployment. And, as suggested by the regressions performed in the last section of this volume by Guido Tabellini, unemployment is a better predictor of individual happiness than market work.

Does this suggest then that there is no role whatsoever for Governments in working time arrangements?

There may be still a role for Government when private negotiations between firms and unions do not provide adequate representation of outsiders and of preferences of the average citizen. For instance unions have often opposed the spread of part-time work, de facto excluding many women from labour force participation. Under these conditions, policies encouraging the use of part-time can be rather effective in providing representation to marginal groups. To the extent that these groups can find a job, they may also get stronger representation among workers’ organizations, e.g., as happened in the Dutch unions, where women are currently rather influential. Thus, public policies may just have a temporary role to play while the interests that were initially poorly represented at the bargaining table, find their voice.

In any event, public policies also in these cases should try as much as possible to promote rather than hinder flexibility in working time arrangements. One way to achieve this result is to change regulations on normal hours and overtime by defining them over a longer time span, i.e., a year rather than a week, acknowledging problems in measuring annual hours worked for highly mobile low-skilled workers (Hamermesh, 2002). After all, we are living longer and we should also have longer working lives. More flexibility in adjusting intensive margins is essential not only to accommodate an older workforce, but also to allow younger workers to prepare for longer effective working lives by maintaining their own human capital, thereby stimulating life-long learning in firms.

Tito Boeri
References


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Needless to say, we are very much indebted to all those who attended that conference and contributed actively to the discussion. In particular, we wish to express our gratitude to Cesare Damiano, Italian Minister for Labour, Barbara Pollastrini, Italian Minister for Equal Opportunities and Tiziano Treu, President of the Labour Commission of the Italian Senate, for their insightful remarks on the Italian labour market.

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PART I

THE DISTRIBUTION OF TOTAL WORK IN THE EU AND US

by

Michael C. Burda (Humboldt Universität zu Berlin)
Daniel S. Hamermesh (University of Texas at Austin)
Philippe Weil (ECARES, Université Libre de Bruxelles)
The Distribution of Total Work in the EU and US

Michael C. Burda
Daniel S. Hamermesh
and Philippe Weil*

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* Burda: Professor of Economics, Humboldt-Universität zu Berlin, IZA and CEPR; Hamermesh: Edward Everett Hale Centennial Professor of Economics, University of Texas at Austin, NBER and IZA; Weil: Professor of Economics, Université Libre de Bruxelles (ECARES), Institut d’Études Politiques de Paris, CEPR and NBER. This paper was prepared for the annual conference of the Fondazione Rodolfo Debenedetti held in Portovenere, Italy, on May 27, 2006. We thank Alberto Alesina, Olivier Blanchard, Michaël Castanheira, Tito Boeri, Georg Kirchsteiger, Chris Pissarides, Guido Tabellini and participants in seminars at several universities and the Portovenere conference for helpful comments and discussions, Rick Evans and Juliane Scheffel for their expert research assistance, and Tito Boeri and Anna Sanz de Galdeano for supplying some of the data sets.
General introduction

Facts about work time, unemployment and labor-force participation in the US and Europe have been established for many years. Researchers have charted their changes, and transatlantic differences in their levels and vicissitudes have been studied at great length. Facts about how Americans and Europeans spend their time away from the labor market and how these have changed over time have barely been considered. Even within the context of market work, we know almost nothing about how the timing of this activity—across a day or a week—differs across the Atlantic. Our general purpose here is to establish a variety of new facts about both of these dimensions of human behavior—the amount of different types of non-work activities undertaken in Europe and the US, and the timing of market work—and to offer some theoretical explanations for them.

The issues that we study are important for a variety of reasons. If nothing else, however, simply adducing these facts has the tremendous virtue of enhancing both scholarly and public awareness about some characteristics of human behavior that are central to people’s conceptions about how societies function and that can inform average citizens’ views of what is occurring in their own and others’ economies and societies. As such, the facts and their explanations perform, we believe, a general educational function that should not be underestimated. On narrower, economic grounds they allow us to study current differences and recent changes in well-being (economic welfare) across countries along a variety of dimensions. We believe that this is a major step beyond merely looking at the amount of non-work activity and basing discussions of well-being on that one dimension, which is narrow both in terms of what people do and when they do it.

In Chapter 1 we focus on data describing the time that people spend in each of the many activities that make up their day. We focus on data from the late 1980s and early 1990s, and for the early 2000s, for Germany, Italy, the Netherlands and the US. We examine patterns and changes in non-work activities that we classify into several major groups. We then proceed to ask such questions as: How do patterns of work activities differ over the week, and over the day, in the EU and US? Would market work in the EU look the
same as in the US if Europeans had the same patterns of daily and weekly market activity as Americans?

In Chapter 2 we offer a variety of explanations for some of the facts that we have discovered in Chapter 1. Of particular interest is our attempt to explain our findings about male-female differences in the amount of total work—market work plus household production—that we discussed at length in the previous chapter. We examine the minimal requirements of a theory that might explain our findings, and in doing so we develop a theory of the mechanisms by which social norms can affect sex roles in market and non-market productive activities. The chapter then proceeds to consider the welfare implications of coordinating non-market activities within a local or national economy and develops a model that helps to explain some of the findings in Chapter 1 on the timing of market work.

While Chapter 2 dealt with the work-leisure distinction and the timing of work, Chapter 3 is concerned with the mix of work activities between the market and the home. We first derive some predictions about the relative importance of income and after-tax wages on market versus household work. We examine some of these ideas using data we developed in Chapter 1, focusing on the role of differences in labor taxation across the various EU countries and the US. We then consider how the choice between market and home work is altered when working the market engenders set-up costs—when market work is costly in terms of money and/or time over and beyond remunerated time. We examine the role and effects of these costs on the same current data for Germany, Italy, the Netherlands and the US that we analyzed in Chapter 1. This discussion allows us to infer how working in the market alters what people do outside the market; as such, it provide insights into the welfare effects of different patterns of market work.

Without going into the specific findings or explanations that this essay generates, a reasonable generalization of its results and analysis is that the US really is different from Europe in ways that had not previously been pointed out. Nonetheless, there are striking similarities within societies that, we believe, stem from an underlying sameness in people’s basic values along a number of dimensions. We hope that our analyses will pave the way for substantial additional research that compares Europeans and Americans along dimensions beyond the narrow one of the amount of market work that is undertaken on the two continents.
CHAPTER 1

Time use and work timing inside and outside the market

I. Introduction

An immense literature has examined U.S.-European differences in labor-force participation rates, weekly work hours, annual work hours, vacation time, etc., making the simple distinction between market work and all other time—all non-work (e.g., recently, Prescott, 2004; Alesina, Glaeser, and Sacerdote, 2005). The narrower question, “What are the differences between the U.S. and Europe in what people do with their time when they are not on the job?” has only rarely and partially been addressed (Freeman and Schettkat, 2005).

The answer to this question is crucial for a variety of reasons. In terms of understanding differences in well-being within the EU, and between the EU and the U.S., we cannot simply look at the amount of time spent in work in the market and time outside the market. While the nature of work differs across members of the labor force, at least all work can be viewed as something that individuals must be induced, through the receipt of a wage, to undertake. No such logical homogeneity exists with the broad category of non-work time. A half-hour spent changing an infant’s dirty diaper is probably less enjoyable than a half-hour of sexual activity. Indeed, the two are totally different conceptually: The former is something that one can pay someone else to do; the latter cannot be “contracted out”—the pleasure from it generally cannot be obtained vicariously. With this consideration in mind, it seems reasonable to examine differences in non-market time use across countries, and particularly between Europe and the U.S. Equally important, it is worth examining how these differences might have changed in the past 20 years.

The scholarly examination of people’s choices between work and non-work has probably been the most heavily pursued aspect of labor economics (Stafford, 1986). The reason for this attention is partly the importance of the topic, but partly too the ready availability of data from many countries that allow us to examine demographic and economic differences in and the determinants of the probability that people work, their weekly and annual hours of work, and the behavior of their work time over the life cycle. Despite the obvious importance of looking more closely at how
people spend their non-work time, relatively little attention has been paid to describing its patterns and examining its determinants. A few studies have considered how the price of time affects the distribution of non-work time (Kooreman and Kapteyn, 1987; Biddle and Hamermesh, 1990); others (Gronau and Hamermesh, 2001; Hamermesh, 2005) have examined how economic factors affect the diversity of activities in which people engage outside the workplace and the extent to which they seek temporal variety. Generally, however, this line of inquiry has been limited by the relative paucity of available data sets. Until recently no country provided data on a continuing basis on how its citizens spend their time, and many have never provided such information. This absence of data has begun to change, and that change is what enables us to examine issues of the allocation of non-market time.

In this initial chapter we discuss a way of classifying the myriad different activities that people undertake outside the market. Some classification is necessary if we are to make what is an immense amount of information manageable. We then describe how the relevant data sets are collected and the benefits—and pitfalls—associated with drawing inferences from these data. Next we present simple comparisons of time allocation for Germany, Italy, the Netherlands and the U.S. separately at a point in time and over time, for all adults and for women and men separately. We inquire into whether the observed changes and differences in time allocations within and across the four countries studied are attributable to changes and differences in their citizens’ characteristics. The final substantive discussion deals with the timing of these various activities—does timing, along a number of different dimensions, including across the week and over the day, differ across countries, and how has it changed.

II. The economic motivation

The basic theory underlying our discussion is that of home production—the idea that people choose how much to work in the market and how to combine the remaining time with the goods that they purchase with their earnings (and unearned income) in order to maximize their satisfaction (Becker, 1965; Gronau, 1980). The fundamental contribution of this idea is that on average those people with higher prices of time (higher wage rates) will substitute purchased goods for time in producing “commodities” that contribute to their well-being. Thus a high-wage American couple will spend their time flying to the Côte d’Azur for a one-week holiday, while a lower-wage American couple will take a two-week caravan trip to the Great Smoky Mountains National Park. Both households have the same amount of time; but because the former has, at least potentially, a
much higher income, unless it saves the entire difference between its income and the lower-wage couple's income, it will enjoy holiday time that is more "goods-intensive." The well-off household must economize on its relatively scarce time; the poorer household must economize on the relative scarcity of goods it can purchase.

The number of different possible activities—combinations of goods and time—that one might consider is nearly infinite. All of these household activities can be viewed as part of household production—the generation of satisfaction-enhancing commodities through the combination of time and purchased goods. Yet we need to devise some way of aggregating them into useful economic categories in order to be able to talk about them and measure them. There is no single correct way of classifying these commodities and the time inputs into them: Aggregation methods are necessarily arbitrary. The one we use here has the virtue of providing fairly clear-cut economic distinctions while still reducing the number of aggregates to manageable proportions. Moreover, using arbitrary, but identical methods of aggregation across countries allows a certainty when we make international comparisons that is lacking from the few scholarly works that have made such comparisons based on published data.

The first type of activity is that for which people are paid: Market work. We assume that people would not be working the marginal hour in the market if they were not paid, so that at the margin market work is not enjoyable (or at least is less enjoyable than any non-work activity at the margin). Market work is the only category of activity currently included on the production side of national income accounts. In the economics literature it has, as our Introduction suggested, generally been treated as the flip-side of the aggregate of all activities outside the market.

Some of the activities in which we engage at home, using our own time and some purchased goods, are those for which we might have purchased substitutes from the market instead of performing them ourselves. We can hire someone to cook our meals (and buy the food) and clean up the dishes afterwards; we can hire nannies to care for our children instead of spending the time ourselves; and we can hire a painter rather than paint the house ourselves. Such household production activities, those that satisfy the third-party rule (Reid, 1934) that substituting market goods and services for one's own time is possible, may be enjoyable, even at the margin; but they still have the common characteristic that we could pay somebody to perform them for us and we are not paid for performing them.

The extent to which household production activities are contracted out is important in evaluating levels and changes in households’ well-being, since we measure economic well-being by GDP, what is produced in the
market. To the extent that in any country over time households are reducing the amount of household production that they undertake, measured GDP will be growing more rapidly than the country's actual economic welfare. For that reason alone it is crucial to measure levels of and changes in household production and to distinguish them from other household activities, and some efforts have been made to propose methods of doing that (Abraham and Mackie, 2005).

Other activities are things that we cannot pay other people to do for us but that we must do at least some of. We must sleep or eat for ourselves in order to derive any benefits from these activities—nobody else can do these for us and still let us derive any benefit from them. Someone else can shop for food for us; but the actual production of the activity is ours alone. Such tertiary activities form the third general aggregate. It should be prima facie clear from this distinction between them and household production why it is important to disaggregate non-market time: A drop in non-market time because people are contracting out more activities has much different implications for their well-being than does a similar decline in tertiary activity. The two types of activities are imperfect substitutes, nor are they likely to be equally substitutable for market work (the standard condition that would allow the aggregation of these non-market activities).

The fourth and final aggregate is leisure. We include in this category all activities that we cannot pay somebody else to do for us and that we do not really have to do at all if we do not wish to. Television-watching, attending religious services, reading a newspaper, chatting with friends, etc., should be included in leisure. Leisure, of course, is inherently satisfying; but so is some (probably infra-marginal) household production, such as the first minute spent mowing the lawn or the first time one reads a new book to one's three-year-old; so too clearly are the first few hours of sleep in day (see Abraham and Mackie, 2005). What distinguishes leisure from the other types of home activities is that one can function perfectly well (albeit not happily) with no leisure whatsoever: None is necessary for survival.

We believe that this fourfold distinction is theoretically useful and can be implemented empirically. Nonetheless, as with any accounting system, many of the classifications can be debated. Some might argue that religious activity should be viewed as a tertiary activity, since its ubiquity throughout human history might suggest that it is as necessary as eating. Obversely, given that most sex today is not for procreation, that activity might well be classified as leisure rather than as tertiary. While bathing is nearly universal, one could argue that it is not a human need and should be viewed as leisure.

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1The example that is often brought up by those concerned about national income accounting is that of volunteer work (see Abraham and Mackie, 2005). In most of our empirical analyses we count it as leisure, but one might argue that volunteer work could be
All household production contains at least some consumption component and might be viewed at least partly as leisure; all tertiary activities have some leisure component; and many leisure components, for example, exercise, might be viewed as investments (e.g., in health) that could be classified as tertiary. The main point is that one must choose a set of aggregates that can be consistently implemented across time and space.

In what follows we examine how activities have been divided among these four aggregates in Germany, Italy, the Netherlands and the United States, and how that division has changed in the past two decades. Because one or two activities constitute the major component(s) of these aggregates—e.g., sleep in tertiary activity, television watching in leisure—we also focus attention on several sub-aggregates for the four countries that we study.

III. Data on time use—generally and in this study

A. General description. In this Section we describe time-use data generally and the main data sets that we use specifically. We do this because these data underlie both the evidence we provide in report and because such data are much less familiar to economists and the general public than are the conventional labor-force data from surveys that obtain information on time spent at work in some recent week or year.

An increasing number of national governments have fielded time-diary surveys. Such surveys have been conducted for over 60 years (Sorokin and Berger, 1939), but it is only recently that they have been available on regular bases in many industrialized countries. Indeed, even before then surveys were fielded (e.g., Leeds, 1917) that elicited recall data on time spent in a set of non-exhaustive household activities during the previous week (essentially the same as is done today in major household longitudinal surveys such as the PSID). The general idea in a time-diary study is to give each respondent a diary for one recent (typically the previous) day and ask him/her to start at the day’s beginning with the activity then underway and then indicate the time each new activity was undertaken and what that activity was. The respondent either works from a set of codes indicating specific activities, or the survey team codes the descriptions into a pre-determined set of categories. No matter how extensive a set of codes is, each survey will have a different way of coding and aggregating what might seem like the same activity to an observer. Time diaries have the virtue of forcing respondents to provide a time allocation that adds to 24 hours in a day. Also, unlike retrospective data about last week’s or even last year’s time spent working, performed by market substitutes and should be included as a secondary activity; alternatively, one might point out that it is mostly consumption and should be included as leisure.
while the time-diary information is necessarily based on recall, the recall period is only one day. The shorter recall period and the implicit time-budget constraint suggest that information on market work from time diaries is likely to be more reliable than the recall data from the standard labor-force surveys; and, of course, time diaries provide information on non-market activities that is unavailable from labor-force surveys.

In some time-diary studies only one day’s diary is collected from one household member; in others, several days’ diaries and/or several household members will appear in the sample. The extent of demographic and economic information available also varies across surveys, with economic characteristics in most of the surveys being fairly sparsely reported. With one old and very minor exception, none of the time-diary studies provides longitudinal information (except for the very short-term information generated because diaries are kept for two or more days within the same week).

B. The specific data. Many European countries have now generated time-diary surveys; while in most cases these have been recent one-off efforts to measure the allocation of time, there has more recently been some effort to create some uniformity in the coding and questionnaires. Unfortunately, however, only a few countries have undertaken repeated surveys, albeit at irregular intervals, that have used identical or nearly identical categorizations of activities and that thus allow us to compare how non-market time use has changed over time. For that reason, although we recognize they can in no sense be viewed as representative of how Europeans use time, we concentrate most of our attention here on Germany, Italy and the Netherlands. We do not argue that these countries are typical of the EU in any way. Rather, all three have produced large nationally representative time-diary surveys recently and around 10 to 15 years earlier, and in all three the surveys and coding mechanisms were nearly identical (Germany and the Netherlands) or fairly similar (Italy) over time.

The German data are from the 1991/92 and 2001/02 Zeitbudgeterhebungen conducted by the Statistisches Bundesamt (1999). In 1991/92 adult members of each household were asked to complete time diaries on two consecutive days. Nearly 16,000 individuals completed diaries, with nearly all respondents completing diaries on two days (and with minor discrepancies the days are equally distributed across the week). In 2001/02 we have diaries from 14,000 people, about half with diaries on two consecutive days, half on three consecutive days, with the survey days disproportionately recorded on weekends. The categorization of activities allowed for over 200 different activities, with coding being almost identical in the two surveys; and respondents could report their time use in five-minute intervals. Because the
1991/92 survey was undertaken immediately following re-unification, we restrict almost all the discussion of the German data to the former West Germany. We do, however, present a brief discussion of the major dimensions of time use in the former East Germany.

The Italian household diaries *Uso del Tempo* were conducted over 12-month periods in 1988/89 and 2002/03 by ISTAT (see ISTAT, 2005, for a description of the recent survey). Roughly 36,000 individuals, each in a separate household, completed a time diary for one day in 1988/89, as did roughly 51,000 people in 2002/03. Diaries were collected in roughly equal numbers in each case from among the five weekdays as a group, Saturdays and Sundays. The possible categorizations of activities in 1988/89 totaled around 150, while in 2002/03 250 categories were possible. There is no direct mapping from the earlier to the later data, although the market work and household production categorizations of activities are very closely comparable.

The Dutch *Tijdbestedingsonderzoek* (NIWI, 1993) is a quinquennial cross-section time-budget study that has been conducted since 1970. In our analyses we use the surveys conducted in October 1990 and October 2000. The 1990 survey covered 3415 adults, the 2000 survey 1531 adults, with one from each household, whose diary records were kept for seven consecutive days (Sunday through Saturday). In each case half the sample produced diaries in one week, half in the next; but because one of the two weeks in 1990 included the Saturday/Sunday when Europe went off Summer Time, we can only use one week’s data from that survey. Each individual listed the activity engaged in at each quarter-hour of the previous day. The range of possible activities encompasses over 200 usable activities.\(^2\)

Until 2003 the United States lagged much of the developed world in the availability of time-diary information. There had been occasional small-scale surveys, but no large-scale nationally-representative survey had been conducted. We thus use the 1985 Time Use Survey (Robinson and Godbey, 1999), a university-conducted survey of 5000 individuals, including both spouses in a married-couple household, each of whom kept a diary for one day that covered activities on the previous day. A total of 87 activities was possible, covering activities in each quarter-hour of the previous day. The hebdomadal distribution of days is nearly uniform.

American backwardness in the production of time-diary data ended with the introduction of the American Time Use Survey in 2003. The 2003 ATUS offers one-day diaries from nearly 21,000 individuals (see

\(^2\)Even this large number of activities results from combining time spent reading each particular newspaper and magazine into one overall category, newspaper/magazine reading.
Hamermesh, Frazis, and Stewart, 2005). Because exact starting and stopping times for each activity are listed in these computer-assisted telephone surveys, the duration of activities is variable to the minute. The survey offers 406 basic categories. The ATUS collected half the diaries on the two weekend days, while the other half was spread across the five weekdays.

The Tables in the Appendix presents information on the main categories in each of the eight surveys that are used to create the four aggregates on which we concentrate. In these Tables, we summarize the main categories (for examples, 9 in the German data, 17 in the ATUS) that make up each aggregate. The descriptions are translated from the originals.

Throughout this chapter we restrict comparisons for Germany, Italy, the Netherlands and the U.S. so that all the data sets are based on individuals ages 20 through 74. This eliminates only a few teenagers or much older citizens. The restriction is imposed to ensure comparability across the data sets, as they differ in the minimum ages surveyed and, in a few cases, in the maximum age covered. More important, since we wish to obtain statistics describing a representative day of the week, and some of the surveys over-weighted weekends, we weight all calculations to adjust for this statistical problem and thus present data for a representative day.

C. Pitfalls. There are a number of problems with time-diary data generally and with the particular data sets that we use. Unlike well-known national longitudinal or cross-section household surveys, response rates in time-diary surveys are quite low. Many more potential respondents in the sampling frame must be contacted in order to obtain a reasonably-sized sample of diaries. In the ATUS, for example, the non-response rate was over 40 percent, and it was above 70 percent in the 2000 Dutch data. Whether the respondents are a random sample of the population along observable dimensions is not always clear, but there is some encouraging evidence on this for the ATUS (Abraham, Maitland, and Bianchi, 2005). The more difficult question is whether non-response is non-random along unobservable dimensions that may be correlated with the distribution of activities and/or with the observable demographic/economic variables used to describe patterns of time use. We cannot infer the extent of biases from this source with the available data; but their possible existence makes it clear that the distinct advantages of time diaries over conventional household surveys may come at a cost.

Most people engage in more than one activity at the same time during at least part of their waking hours. Unfortunately, the Dutch data allow the respondent to list only one activity at a time, as does the American 1985 TUS. The 2003 ATUS does allow people to list childcare as a secondary activity,
but it is the only secondary activity that is recorded. The German and Italian data sets do provide fully for the possibility of secondary activities. The general absence of information on secondary household production means that, to the extent that the amount of multi-tasking increases over time, as we would expect if full incomes are rising and variety of activities is a superior good (as shown in Gronau and Hamermesh, 2001, comparisons over time will be biased. All we can hope is that these biases are minor over the fairly short periods (10 to 18 years) that we examine compared to any other secular trends that we observe.

As we have noted, the different countries’ time-diary data are based on different categorizations of activities. Even with the broad aggregations on which we base our analyses, we cannot be certain that an activity that we classify in the United States as, for example, leisure would be classified as leisure in Germany. Indeed, even if the same categorizations were used in all four countries, cognitive differences due to language and culture could well generate different categorizations of what an outside observer would view as the same activity. One must be very careful about making cross-country comparisons of the amounts of time spent in different specific activities, and even of time spent in these broad aggregates. The same caveat, of course, applies to conventional labor-force surveys as well.

The problem is much less acute if we merely compare changes in time use over time within a country based on diaries using the same categorizations. Thus comparisons of changes in time allocation over a decade in the Netherlands and Germany thus seem fairly safe. Even here, however, comparisons across time can pose some problems. The more recent Dutch and German categorizations allow for the category of time spent on computers at home for work or non-work purposes. Does time spent on such activities take the place of what would have previously been leisure, such as playing games? Or does it substitute for household production, such as managing household finances using pen and pencil? We cannot be sure how the coding of activities changes when new possibilities are provided; and there are always wholly novel activities that did not even exist earlier, which pose problems analogous to those of new goods in consumer theory. The problem is somewhat greater in the comparisons within Italy over time, as the number of possible categories is much greater there, and time spent in travel cannot be specifically linked to other activities in 1988/89, while it can in 2002/03.3

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3In constructing the aggregates for 1988/89 we prorate travel time among the three aggregates that are not necessarily mainly conducted at home—market work, secondary activities and leisure.
The problem is still more severe in the U.S. data, as there are many more categories in the ATUS than in the 1985 TUS and the surveys were conducted by different organizations.

We believe that, because we concentrate on broad aggregates, problems with making comparisons over time within the Netherlands and Germany are minimal. Even less problematic are comparisons at a point in time, such as across demographic groups, within any of the countries that we examine. The problems may be greater in comparisons within Italy over time, and greater still for time-series comparisons in the U.S. Any cross-country comparisons of time use that we or anyone else makes should be taken with several grains of salt, and those that we do make here should be viewed as tentative.

IV. Time use in Germany, Italy the Netherlands and the United States, 1985-2003

A. Differences in time allocation. The first thing to examine is aggregate information on how people in each of the four countries spent their time and, more important, how their use of time changed across the two surveys that we have for each country. Thus Table 1.1 presents these averages for all individuals in each of the four countries, while Tables 1.2M and 1.2F present them separately for men and women. For each of the four main aggregates, and for four large sub-aggregates, we present the averages (minutes per representative day) and their standard errors. The data in Table 1.1 are population-weighted averages of the data that are presented in Table 1.2 separately by sex, since women are typically over-represented in time-diary surveys.

a. Differences within country and by gender. As we noted, the most reliable comparisons are within countries. Looking first at the United States in 1985 and 2003, it is quite clear and unsurprising that men spend more time in market work than do women, and that women spend more time in household production activities. Women spend more time in tertiary activities in the U.S, Germany and the Netherlands, partly because they sleep more (Biddle and Hamermesh, 1990); but they spend less time in such activities in Italy, even though they sleep about as much as men. In the three Anglo-Saxon countries men spend somewhere between 10 and 25 minutes more time in leisure, than women with the difference due entirely to their spending more time watching television. In Italy, however, they spend roughly one hour more than women enjoying leisure, with less than half the difference arising from the extra time that men spend in front of a television screen.
The differences across gender are almost the same in the two northern European countries, but are much different in Italy. As in all industrialized countries, however, European women work less in the market than their male counterparts, and they do more household production. Like American women, they spend as much or more time in tertiary activities than their male fellow citizens, mostly because they sleep more; and they spend
less time than men at leisure, partly because they spend less time watching television.

There has been a huge literature making cross-country comparisons of gender inequality in labor-force participation and hours of market work (e.g., Bertola, Blau, and Kahn, 2002). We can go beyond that here to examine gender inequality in all aspects of time use across countries independent of any problems in categorization. The cross-country comparisons are free of problems so long as we are satisfied that differences in how men and women’s activities are aggregated into the four aggregates do not vary across countries.

For any of the four countries define an inequality index I as:

$$I = \sum_i \left( \frac{C_{iM} - C_{iF}}{\sqrt{C_{iM} \cdot C_{iF}}} \right),$$

where the subscripts i are the four main aggregates of activities, C — the averages of market work, household production activities, tertiary activities and leisure, and M denotes men and F women. If the average amounts of time spent in the four aggregate activities are the same for men and women, this index will equal zero. Calculating $I_{US}$ for 2003 yields 1.06; for Germany in 2001/02 $I_G = 1.40$; for Italy in 2002/03 $I_I = 3.49$; and for the Netherlands in 2000 $I_{NL} = 1.44$. Part of the difference in this index between the U.S. and the other three countries is due to the greater gender similarity of time spent in the market in the U.S. But even if we restrict the calculation in (1.1) to the three aggregates of non-market activities, we still find that male-female differences are smaller in the U.S. than in the EU countries (with
the three-activity inequality index equaling 0.61 in the U.S., 0.71 in Germany and the Netherlands, and 1.34 in Italy). The data show not only that the United States currently approaches a unisex market for paid work more closely than these European countries, but also that gender inequality in the distributions of household production, tertiary time and leisure is greater in these three EU economies than in the U.S.

While the genders are not equal within each country at each point in time in terms of the allocation of time across these four main aggregates, there is another comparison that is apparent in these data. Let us define “All Work” as the sum of time spent on the representative day on the total of market work and household production. Given the definition of household production, All Work might be viewed as the sum of market and non-market production.

Examining Tables 1.2M and 1.2F one sees that All Work totals between 390 minutes and 519 minutes (6-1/2 to 8-2/3 hours) in the 16 samples (four countries, two years, two genders). Compare the value of All Work (again, the sum of market work and household production activities) within each country at a point in time across genders (across Tables 1.2M and 1.2F). Among the three Anglo-Saxon countries, except for Germany in 1991/92 the difference in All Work across genders never exceeds 11 minutes; and even in Germany in 1991/92 the excess of men’s All Work over women’s is only 25 minutes (less than one-half hour on a total of over eight hours). On might conclude that iso-work characterizes both genders in these three wealthy northern countries. In Italy, however, the difference was an excess of total work among women of 72 minutes in 1988/89 and 75 minutes in 2002/03.

While total work by both men and women decreased over the fourteen years

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4To address one of the many necessary arbitrary aggregations using the different categories, consider our classification of volunteer work as leisure. For the U.S. in 2003 we recalculated the means to include both volunteer work and non-household care activities. Women performed 29 minutes of these activities, men 23, so that the 4-minute excess of men’s All Work would be changed to a 2-minute excess of women’s All Work over men’s if we had included these two categories as secondary activities. Making the same calculation for the German data for 2001/02, we find that men performed 11 minutes, women 8 minutes of volunteer work. If added to the totals in Tables 1.2, this would have reduced the 8-minute excess of female All Work to an excess of only 5 minutes. The same calculation for the Italian data from 2002 shows that women performed 14 minutes, men 9 minutes of volunteer work. Doing the same thing for the Dutch 2000 data shows that men performed 9 minutes, women 12 minutes of volunteer work, which if added to household production would have reduced the 7-minute excess of male All Work to only 4 minutes. In all three recent Anglo-Saxon data sets this slight expansion of the definition of All Work in fact equalizes still further the gender distributions of All Work, while for Italy it exacerbates the excess of female over male work.
between the two Italian surveys, the excess of total work among women remained essentially unchanged.\textsuperscript{5}

The similarity in All Work by gender in rich countries has been noticed by sociologists. Thus Robinson and Godbey (1999) cite a UN report showing that this fact holds on average for data from 14 countries, and Gershuny (2000) shows that it characterizes data covering the 1960s through mid-1990s for an even larger sample of data sets. No study has demonstrated it using data sets that were as well harmonized as the ones we have assembled here; and economists seem to be blissfully unaware of the fact and have never examined it. Indeed, even sociologists who have demonstrated it (e.g., Mattingly and Bianchi, 2003, for the United States, and Bittman and Waclman, 2000, for several countries), quickly move beyond it to discuss why they believe that women’s work is more onerous than men’s, and why women’s leisure provides less pleasure. All we do in this Chapter is note the existence of iso-work in three of the four wealthy countries for which we have detailed data. In Chapter 2 we provide one explanation for this fact; but clearly, others are possible; and the causes of the iso-work phenomenon and its implications for theories of household behavior are all interesting topics that deserve much more research by economists and others.

If the equality of total work across genders holds in many countries, it contains an interesting additional implication for the effects of macroeconomic fluctuations by gender. If this phenomenon holds in different countries at different time, and in the same country at different times, it suggests that the impact of macroeconomic fluctuations on All Work is the same for both sexes. Macro fluctuations may increase or decrease the total amount of (market and non-market) work; but they do so nearly identically for both men and women.

b. \textit{Comparisons over time and across countries}. Comparisons over time within the four countries for which we have detailed data at two points in

\textsuperscript{5}It is interesting to examine what activity or activities are the particular source(s) of the striking difference between Italy and the other three countries. Taking the more recent data sets, the average difference between genders in All Work in the three other countries is -1.3 minutes per day (more market work and household production by men), compared to the Italian difference of 74.6 minutes. Of the Italian women’s excess of total work of 75.9 minutes (1-1/4 hours per day) compared to the difference elsewhere, fully 45.5 minutes are accounted for by one activity, cleaning house, compared to the average amount of housecleaning by gender in the other three countries. This unusual Italian behavior appears to be well-recognized in popular literature: “Italian men... are pueri aeterni, who expect their wives to replace their mothers, and iron their shirts and fret about their underwear.” (McEwan, 2006, p. 231).
time are quite sensible for the Netherlands and Germany, but may be somewhat questionable in Italy and the U.S. because the categorization of activities differs so sharply between the two surveys. Taking the Netherlands first, the most striking change in the 1990s was the tremendous growth in the fraction of women who report some market work during the survey week, a rise from 24 percent to 31 percent of all the women ages 20 through 74 included in the survey. This tremendous change was accompanied by a small increase in time spent at work by women who worked, so that the average amount of time Dutch women spent at work on a representative day increased by 33 minutes (35 percent) per representative day. This striking increase was accompanied by a tiny and insignificant drop in male work time (and in the propensity to work), so that the amount of market work by the average respondent increased by 15 minutes per day (nearly 2 hours per week).

Why this increase occurred is not at issue here (but see Jacobsen and Kooreman, 2005 for an argument that more lenient retail-hours laws might have had this effect). Perhaps too the large increase in women’s part-time work in the Netherlands had this effect, a possibility that is corroborated by the observation that the percentage increase in minutes of work is only slightly larger than the percentage increase in the fraction of women working at all. What is of interest here, however, is how this change affected non-market time use in the Netherlands. Interestingly, looking at Table 1.2F, we see that the increase was almost completely offset by a decline in time spent in household production. Dependent care time did not change much, and shopping time did not change at all; rather, other household production activities, cleaning/cooking and other household activities (gardening, home repair, etc.) decreased substantially. This “Dutch Revolution” was accompanied by a decrease in leisure (not due to decreased television-watching), but that decline was offset by an equal increase in tertiary time (due to increased time reported sleeping). The shift toward market work and away from household production reported by Dutch women was rapid and striking and provides the best evidence for at least partial substitutability of these two types of activity in the aggregate and for the need to go beyond the work non-work distinction.

Over this decade West Germany saw a striking decline in the average amount of market work, which dropped by nearly one hour per day (7 hours per week). (The decline was also one hour per representative day in the former East Germany.) Most of this drop occurred among women, and most of the change among women resulted from a large decline in the fraction of women who reported that they were working on the diary day. (The pattern of change was the same, although the levels differed substantially, in the former East Germany.)
Comparing the Italian data across the two years is, as we noted, somewhat more difficult, due to the greater differences in the underlying categories. This is more the case for the aggregates of tertiary activities and leisure, as there were more changes in the coding of their component activities across the surveys. Market work seems the most consistently defined in the two samples, with household production activities falling in between. There appears to have been a decline in market work of about 40 minutes per representative day over this period; and it has not been accompanied by any change whatsoever in household production. Rather, the entire drop has been included, along with a shift out of tertiary time, in the large rise in measured leisure. While the part of this increase leisure resulting from a shift away from tertiary time may be a classification issue, the part resulting from the decline in All Work seems real.

Comparisons over time in the U.S. are still more problematic because the classifications differ greatly across the two surveys; but it does appear that Americans were doing a bit more market work by 2003, mainly because of the continued increased in the propensity of women to work for pay. The bigger changes, which underline the importance of distinguishing among types of non-market time use, are within non-market time itself. In particular, household production activities increased substantially, mainly because dependent care appears to have increased; while tertiary activities decreased, even though time spent sleeping went up. Finally, women’s leisure activities decreased, although this was not due at all to a change in the amount of time spent watching television. The changes in men’s activities appear to be in the same direction as women’s, and for them too non-television leisure declined. Issues of comparability across the surveys make any of these comparisons for the U.S. somewhat shaky. Probably the most reliable comparisons are of the activities sleeping and radio/TV, which are the most specific of those listed here, so that it seems fair to conclude that Americans are now sleeping more than in the mid-1980s and that American men are watching even more television than before.

Over a longer time period we are doubtful whether the drop in leisure that we have demonstrated for the U.S. would be observed. Indeed, the point of Aguiar and Hurst (2006), based on their attempts to make diverse U.S. time-diary data sets commensurable, is precisely that there was a rise in the total amount of leisure consumed by the average American between 1965 and 2003. Perhaps better evidence on this is from Norway, which has conducted four time-diary surveys, 1971, 1980, 1990 and 2000, using essentially identical survey instruments. Among Norwegian men aged 16-74 the total amount of work performed fell by 36 minutes per representative day.
between 1971 and 1980, then stayed constant or even rose slightly. Among women aged 16-74 total work fell nearly steadily, from 7 hours 42 minutes per day in 1971 to 6 hours 55 minutes per day in 2000. Without comparable data sets for other countries we cannot be sure about trends; but there is no evidence of increasing total work in Europe, and some to the contrary.

Although the comparisons over time are problematic in some of these cases, a crucial conclusion is that the sums of market work and household production are by no means constant over time in these four countries. While the Netherlands does exhibit this constancy, with the rise in market work perfectly offset by the drop in household work, changes of more than 30 minutes per day in total work are exhibited in the other three countries.

We can calculate the gender inequality indexes in (1.1) for each of the countries for the earlier years as well as for the later years presented above. The index fell from 1.23 to 1.06 in the U.S., from 1.88 to 1.44 in the Netherlands, and from 4.69 to 3.49 in Italy, but it rose from 0.49 to 1.41 in Germany. The degree of gender inequality in all activities has converged substantially among the four countries. Of course, with only two observations on each, and with a concern about the tremendous change in the macroeconomy in Germany over this period, we cannot say anything about whether or not this represents a trend.

The most problematic comparisons are across countries. It is absolutely clear that Americans watch substantially more television than do Europeans, at least the Dutch, Italians and Germans (and see also Corneo, 2005); much of the extra roughly 30 to 40 minutes per day (3 to 4-1/2 hours per week) comes from less time sleeping in the United States. More important, however, Americans of both sexes spend substantially less time in other, non-television forms of leisure than do Germans, Italians or Dutch.

Going further than this is difficult for all the reasons discussed in the last Section. These problems did not prevent Freeman and Schettkat (2005) from advancing what they called the “marketization hypothesis,” namely that the amount of what we have called All Work does not differ between the U.S. and European countries. This may be the case for some comparisons, but it certainly does not seem valid in the eight possible comparisons one can make using Table 1.1. Taking the earlier years for each country, we see from Table 1.1 that All Work in Germany was 36 minutes more than in the U.S. at that time, and 38 minutes more in Italy, while All Work in the Netherlands was 52 minutes less. In the later period All Work in Germany was 33 minutes less than in the U.S., while All Work in Italy was 29 minutes less and in the Netherlands was 79 minutes less per day than in the U.S. In other words, these comparisons suggest that there is no particular equality

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6 Calculated from http://www.ssb.no/english/subjects/00/02/20/tidsbruk_en/.
in total work across countries at a point in time, nor is total work constant within countries over time. They also suggest that total work in the U.S. currently exceeds that in these three European countries.

The international comparisons are only of behavior on the days when diaries are recorded. Substantial research in the collection of time diaries has made it abundantly clear that diaries are much less likely to be collected on days when an individual is on holiday. Thus the cross-country comparisons based on Tables 1.1 and 1.2 ignored any international differences across countries accounted for by vacation time. This is not just a matter of diaries being collected only over part of the year (i.e., as in the one or two weeks in the Netherlands or the eight months in Germany).

We know that annual holiday time is generally shorter in the United States than in continental Europe Altonji and Oldham (2003). This difference suggests that even the inference that more market work is conducted in the U.S., and less leisure is consumed there, is understated. Were we to obtain diaries from days distributed randomly across the year and independent of whether the respondent is at home or away from home, assuming that holidays include little if any market work, we would observe a still larger excess of market work in the U.S. over Germany, Italy and the Netherlands, and a still larger shortfall of leisure in the U.S. Whether the differences in household production or tertiary time would be magnified or reduced cannot be inferred a priori.

B. Do these differences and changes stem from differences and changes in demographic characteristics? How much of the differences between the amounts of time allocated to the different activities in each country and over time are due to cross-country and temporal differences in the observable demographic characteristics of the sample respondents? In other

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7An interesting question is why their apparent equality of All Work between the U.S. and the average of a number of EU countries in the early 1990s seems so different from our conclusion. One should note that, based on a simple average of the measures of All Work in the data in Tables 1.2 for the early 1990s for Germany, Italy and the Netherlands, one observes simple averages for the three countries of 448 minutes of total work for men and 460 minutes by women, very similar to the U.S. averages by gender. Thus even when we average over just three countries, we obtain roughly the same result (for the 1980s and early 1990s) that Freeman and Schettkat obtained in the averaged data that they published. In the early 2000s, however, there was a shortfall of one hour per day in All Work by men in these three European countries compared to American men, and of over a half-hour per day among European women. These results suggest that averaging across European countries creates an illusion of similarity to the U.S. where none really existed, and that even that illusion was an artifact of the particular time period studied.
words, how much of the difference that we observe across countries represents true differences in behavior, and how much is due to differences in the heterogeneous characteristics of the populations? We thus ask what the allocation of time would look like in Germany, Italy, the Netherlands and the U.S. in each year and for each sex if the sample respondents had the same characteristics on average as did Americans of the same sex and ages in 2003. Viewed otherwise, we are asking how much of the difference between time allocation in the other country/at another time and the U.S. in 2003 results from differences in underlying demographic characteristics.

Examining these decompositions is important. We know, for example, that Italian fertility in the last decade has been far below that of the U.S. and the Netherlands. Adjusting for differences in the age distribution of the populations and for the age and presence of children, adjustments that account for pre-labor market outcomes that may affect choices about time use, makes sense. There have also been substantial differences in unemployment rates between, on the one hand, the U.S. and the Netherlands, and on the other hand, Germany and Italy. It makes no sense, however, to disaggregate time use by employment status: To at least some extent the choice between employment and unemployment is endogenous to other decisions about time use, including the split between All Work and tertiary activities/leisure; and, in any case, we are interested comparisons throughout the labor market.

In Tables 1.3 we present the means of each of the four aggregates for the three European countries measured at the means of a number of demographic variables in the United States in 2003. The averages are adjusted to account for differences in age (a quadratic relationship), marital status, the age of one’s spouse if married (again a quadratic relationship), spouse’s hours of market work or work status (if married), and the presence of children under age 6, and between ages 6 and 17. Calling this vector of control variables $X$, we are thus making the adjustment for, e.g., Germany in 1991/92
Table 1.3F. Predicted Time Use (minutes), Women, if All Samples Had U.S. 2003
Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Italy</th>
<th>The Netherlands</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>246.8</td>
<td>130.9</td>
<td>149.8 133.2</td>
<td>83.8 121.2</td>
</tr>
<tr>
<td>Household production</td>
<td>242.1</td>
<td>315.7</td>
<td>373.4 374.1</td>
<td>291.6 271.6</td>
</tr>
<tr>
<td>All work</td>
<td>488.9</td>
<td>446.6</td>
<td>523.2 507.3</td>
<td>375.4 392.8</td>
</tr>
<tr>
<td>Tertiary time</td>
<td>641.8</td>
<td>672.5</td>
<td>671.4 587.8</td>
<td>646.8 660.1</td>
</tr>
<tr>
<td>Leisure</td>
<td>309.2</td>
<td>320.9</td>
<td>245.4 344.9</td>
<td>417.7 387.0</td>
</tr>
</tbody>
</table>

as:

$$\hat{G}_{US2003}^{1991} = \beta^{G1991}X^{*}_{US2003},$$ (1.2)

where $X^*$ is the vector of means of the control variables $X$, measured for the U.S. in 2003.

Tables 1.3 make it very clear that these adjustments to account for cross-sectional differences in the underlying characteristics of the populations do not alter any of the inferences that we have made about differences in time use across countries or over time. Just as one example, comparing the Dutch data in Tables 1.2 and 1.3, we see that there are some differences (never more than 15 minutes per category) between the adjusted and unadjusted means. These differences are not large, even though they are among the larger of those in the tables, and in no way do they change any of our conclusions about the sharp changes in time allocation in the Netherlands over the decade. The Netherlands would have seen sharp increases in market work and decreases in household production among women even if the Dutch had on average possessed the same demographic characteristics in both 1990 and 2000 as the U.S. had in 2003.

The inferences about Germany in Tables 1.1 and 1.2 would not be altered if German demographics were the same as those in the United States in 2003. West Germany experienced a tremendous economic boom in the early 1990s as a result of re-unification, which was followed by more than a decade of very slow growth. The substantial drop in market work among women and the very partially offsetting rise in household production would have occurred had the women’s characteristics not changed. To the extent that one believes the classifications of activities that we have made, the differences implicit in Tables 1.1 and 1.2 are real, the result of changing behavior, and are not an artifact of underlying differences in demographic characteristics among the countries.

The quantitative conclusions about the changes over time in Italy would be somewhat affected had the demographic structure remained the same.
over time (and the same as in the U.S.). In particular, the observed drop in men’s market work would not have been so large, and the observed decline in women’s household production time would not have occurred, if the demographic characteristics of the Italian sample had remained unchanged. Nonetheless, the comparisons to the U.S. for the early part of this decade remain unchanged: If Italy had the same demographic structure as the U.S. we would still observe less total work among Italian men and more among Italian women than among their American counterparts.

Because of the lack of comparability of the data in the two surveys, the decompositions for the U.S. shown in Tables 1.3 are less reliable than those for the two European nations. Nonetheless, they are interesting too. Among both men and women demographic change alone would have led us to expect only tiny changes in time allocation. In fact, leisure time and tertiary time dropped, while market work and household production increased.

Do these changes in the U.S. represent a still more harried existence for Americans? Perhaps; but, as noted above, issues of comparability may be important here. Even if they are not important, it is quite possible that household production activities took on new meaning over the nearly two decades covered by the data. Shopping may have become more enjoyable—high-end shopping may have replaced grocery shopping (and there is strong evidence that the latter did decrease between these surveys, Hamermesh, 2006a). The unexpected drop in leisure time may have resulted from a shift at the margin toward enjoyable household production activities and away from less pleasant leisure activities. The lack of comparability of the detailed categories in the two surveys in the U.S. precludes distinguishing between these possibilities and renders any comparisons somewhat dubious.

Despite these caveats, the answer to the sub-titular question posed here is a resounding No. The differences that we have noted in time use within countries over time, across countries, and in the EU countries compared to the U.S. exist independent of any differences in the age, marital or fertility structures of the countries.

V. Weekdays or weekends, days or hours, nights or days—does it matter?

All of the comparisons thus far are for the representative day in the week. We have made no distinctions among when the activities are performed. But when people do things does matter: Doing an activity on the same time each day reduces set-up costs, but generates boredom (Hamermesh, 2005); undertaking an activity when others, especially one’s spouse, are doing it is more enjoyable in many types of tertiary activities and leisure; and jointly undertaking an activity increases productivity in many kinds of
market and household production (Hamermesh, 2002; Jenkins and Osberg, 2005). While there are many possibilities for comparisons of differences and changes in the timing of activities in these four economies, here we deal only with three of the simplest: How do the amounts of the different activities performed differ among the countries and between sexes on weekdays as compared to weekends, and how did these differences change over the past 20 years? How does the pattern of activities vary across the days of the week more generally? How does the timing of market work over the twenty-four hours of the working day differ among countries?

A. **Weekday-weekend differences.** Unlike the cross-country comparisons in Section 1.4, where potential differences in the underlying categorizations required us to exercise great care, here such comparisons are less problematic. Most differences in categorizations will wash out when we compare weekday-weekend differences in time allocations in one country to weekday-weekend differences in time allocations in another. In this Section we thus start with these international comparisons, since they are striking. Tables 1.4M and 1.4F present the average time allocations for the four major aggregates and the four sub-aggregates; here, however, we present these averages separately for weekdays and weekend days.

Unsurprisingly, there is less market work by both men and women in all four countries on weekends than on weekdays. What is somewhat surprising is how much more work is performed in the United States on weekends than in the two northern European countries, and how little Italy differs from the U.S. in this regard. In both the Netherlands and Germany the increase in leisure time on the weekends is much more pronounced than in the U.S. Northern Europeans work in the market (less than Americans) during the week, and concentrate their leisure (much more than Americans) on weekends. No doubt some of this is due to different rules on store-opening hours that generate increased retail employment on weekends. Given the size of the retail sector, however, the much smaller difference in market work between weekdays and weekends in the U.S. than in northern Europe must be due to differences in other industries, most likely services. Perhaps that explains the similarity between the Italian and U.S. results too.

International differences in the hebdomadal patterns of household production and tertiary activities are also fascinating. Tertiary activity is greater on weekends in all four countries, due almost entirely to the extra nearly one hour of sleep that the typical adult gets each weekend day compared to each weekday. The major cross-country difference is in the distribution of household production over the week. In all three European countries women undertake more household production on weekdays than on weekends; the opposite is true among American women. We believe this result stems at
least in part from the differences in store-opening hours (Burda and Weil, 2006) between Europe and the U.S., since much of the difference we observe occurs in time spent shopping. It is interesting to note that the loosening of store-opening restrictions in the Netherlands did not result in much of a convergence in time spent shopping on weekdays and weekends there.

The much greater distinction between weekdays and weekends that we have observed for market work carries over to the weekly distinction in All Work—it is not simply due to differences in market behavior that are offset by household production. As the averages in Table 1.4M for All Work show, in both the Netherlands and Germany men perform over twice as much total work on weekdays than on weekends, and Italian men perform nearly 90 percent more market work on weekdays than on weekends. In the U.S. men perform only 60 percent more work on weekdays than on weekends. The international differences among women are somewhat smaller:

<table>
<thead>
<tr>
<th>Table 1.4M. Time Allocations (minutes), Men, Averages and Their Standard Errors, Weekdays and Weekends Separately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
</tr>
<tr>
<td>Italy</td>
</tr>
<tr>
<td>The Netherlands</td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td><strong>Market work</strong></td>
</tr>
<tr>
<td>Work</td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Household production</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Family care</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Shopping</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>All work</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Tertiary time</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Sleeping</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Radio/TV</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Germany</strong></td>
</tr>
<tr>
<td><strong>No. of week-</strong></td>
</tr>
<tr>
<td><strong>diarys</strong></td>
</tr>
<tr>
<td><strong>No. of week-</strong></td>
</tr>
<tr>
<td><strong>diarys</strong></td>
</tr>
<tr>
<td><strong>Market work</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Household production</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Family care</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Shopping</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>All work</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Tertiary time</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Sleeping</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
<tr>
<td><strong>Radio/TV</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td><strong>Weekends</strong></td>
</tr>
</tbody>
</table>
German and Dutch women perform roughly 60 percent more total work on weekdays than on weekends, American women perform only 50 percent more total work on weekdays. Italian women perform only 35 percent more work on weekdays—their household production decreases relatively little on weekends.

Very clearly, the European norm, at least among men, is to perform a much greater fraction of their total work (both in the market and at home) on weekdays than on weekends, leaving weekends especially free for personal care and leisure. Americans—especially men—mix their work and non-work (tertiary activities and leisure) much more between weekdays and weekends than do Europeans.

Interestingly, the only available evidence suggests this homogenization of the week among Americans was not always the case. Using the data in (Szalai, 1972, Tables III.4 and III.5), one can calculate that among employed men in the U.S. in 1965 the ratio of total work time on weekdays to that

<table>
<thead>
<tr>
<th>Table 1.4F. Time Allocations (minutes), Women, Averages and Their Standard Errors, Weekdays and Weekends Separately</th>
<th>Germany</th>
<th>Italy</th>
<th>The Netherlands</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. week-end diaries</td>
<td>5871</td>
<td>1494</td>
<td>6664</td>
<td>6879</td>
</tr>
<tr>
<td>Market work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market work (7.6, 3.6)</td>
<td>396.1</td>
<td>289.0</td>
<td>530.7</td>
<td>529.3</td>
</tr>
<tr>
<td>Work-end days (2.4, 2.2)</td>
<td>390.1</td>
<td>293.0</td>
<td>506.0</td>
<td>506.0</td>
</tr>
<tr>
<td>Household production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (1.5, 1.0)</td>
<td>328.0</td>
<td>415.0</td>
<td>352.0</td>
<td>352.0</td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (1.2, 1.0)</td>
<td>350.5</td>
<td>405.0</td>
<td>332.0</td>
<td>332.0</td>
</tr>
<tr>
<td>All work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (3.5, 2.5)</td>
<td>544.9</td>
<td>503.0</td>
<td>558.9</td>
<td>519.5</td>
</tr>
<tr>
<td>Tertiary time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (1.6, 1.4)</td>
<td>626.7</td>
<td>647.5</td>
<td>670.0</td>
<td>670.0</td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (1.2, 1.0)</td>
<td>544.5</td>
<td>595.0</td>
<td>578.0</td>
<td>578.0</td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (1.9, 1.8)</td>
<td>268.4</td>
<td>289.5</td>
<td>221.3</td>
<td>221.3</td>
</tr>
<tr>
<td>Radio/TV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (2.4, 2.4)</td>
<td>317.3</td>
<td>317.3</td>
<td>97.2</td>
<td>97.2</td>
</tr>
<tr>
<td>Radio/TV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-end days (2.0, 2.0)</td>
<td>317.3</td>
<td>317.3</td>
<td>97.2</td>
<td>97.2</td>
</tr>
</tbody>
</table>
on weekends was 3.4; among working women it was 2.1; and even among housewives it was 1.7 times weekend work. While the data are not entirely comparable to those in Tables 1.4, it does seem likely that the weekly allocation of time in the U.S. nearly one-half century ago was much more concentrated—much more European—than it is now.

Table 1.5 calculates indexes similar to those based on (1.1), but instead of measuring the extent of similarity in time allocations across gender, for each gender and within each country and year we infer the degree to which the allocation of time on weekdays across the four aggregates is like that on weekends. A lower value of the index implies that the representative individual’s time allocations on weekdays and weekends are more similar. The calculation of this index reinforces our inference from Tables 1.4 that Americans do not distinguish between weekdays and weekends nearly so much as northern Europeans—that the distribution of activities on different days of the week is more similar in the U.S. than in northern Europe. Italians, on the other hand, distinguish even less in their weekly distribution of all activities.

Despite the lesser degree of temporal specialization of activities in the U.S. than in northern Europe, clear-cut changes have occurred in the recent past. The index rose substantially in the U.S. over the eighteen years 1985 to 2003, especially among men. Among Dutch men, on the other hand, it fell during the 1990s, but there was no change among Dutch women. The changes in Germany were small for both genders, as they were in Italy. While there has been convergence across the Atlantic Ocean, the change has resulted from changed behavior in the U.S. alone.

There is no reason for the optima to be the same in the two areas. While technologies are undoubtedly similar, or at least approximate each other rapidly in response to technological shocks, the optima that result from the interactions of differing preferences (including those expressed in governmental mandates) and technology will surely differ. Thus while the sharp decline in weekend work in the U.S. is consistent with the observation that work at unusual times is undesirable (Hamermesh, 1999) and will diminish in a growing economy with unchanging preferences and time-neutral technologies, the increase in weekend work in the Netherlands cannot be...
explained without reference to changes outside the workplace that have affected the timing of other activities and work too. Drawing inferences about changes in welfare from even such clear-cut changes as are shown in the tables in this Section is very tricky.

B. Workdays or workhours? These comparisons show that weekends and weekdays are more distinct in Europe than in the U.S. But is that true for all days across the week? More generally, how much of the difference in the number of minutes worked in the market on a representative day in the U.S. and the European countries is due to differences in the probabilities that people work in the market and, given that they do, that they work on a particular day? We are thus asking how much of the gap between minutes worked on a representative day is attributable to differences in the fraction of adults working on that day.

For the two German, Italian and Dutch samples Table 1.6 shows the percentage of the difference from the U.S. in the average amount of time worked per adult due to differences in the probability of working on the day. The percentages cluster around 100, with Italian men in the recent survey being the only exception. These results suggest that the major difference across the Atlantic is in the probability that the representative adult is working in the market on a particular day, not in the amount of time spent working on a day on which some market work is performed. Since in the recent surveys that we have used the average minutes of market work are greater in the U.S. than in Germany, Italy or the Netherlands, the table implies that the result is due entirely to Germans and Dutch of both genders, and to Italian women being less likely to work on a particular day (and less likely to work in the market at all during the week). When they do work in the market they work just as long as Americans on workdays. This corroborates the weekend/weekday difference that we demonstrated earlier in this Section, since it implies more concentration of work activities across days of the week in Europe than in the U.S.

C. Work Timing over the Workday. Having seen that Americans tend to mix market work and non-market activities more evenly over the week,
one wonders whether they also mix them more evenly over the day. To examine this issue we considered the timing of work at each minute of the day among those who work on the particular day. We again consider Germany in 2001/02, the Netherlands in 2000 and the U.S. in 2003 (excluding Italy, since we lack Italian data on the timing of activities). For purposes of comparison to another English-speaking country, we also examine how Australians spread their work time over the day, using data from 1992 (ABS, 1993). We examine the allocations of working timing on Wednesdays, the weekday on which the largest fractions of workers in these data perform at least some work. (The international comparisons are essentially identical on other weekdays.)

Figure 1.1 presents the results for every half-hour interval over the day between midnight and the subsequent midnight. The Figure shows the percentage of the day’s work done at each half-hour; it thus abstracts from cross-national differences in the amount of time the average worker spends on the job during the day. Until 6AM, and after 10PM, a higher fraction of those who work at all on the day are at work in the U.S. than in the other three countries. Workers in Germany and the Netherlands are at work disproportionately only during prime daylight hours—very few are working between midnight and 4AM, and not very many are working after 8PM. The timing of work in Australia is somewhere between that in the U.S. and

---

8Because the activities are coded in 15-minute intervals in the Dutch data, and to avoid masses of repetitive information, we aggregate the time intervals to half-hour periods in this analysis.
northern Europe. The main conclusion from these results is that, just as with their timing of work over the week, so too do Americans mix their market work and non-work over the day. Unlike northern Europe, where most workers are either at work or not, in the U.S. many workers are working at non-standard times of the day.

VI. What have we learned?

As noted in the Introduction, EU-U.S. differences in patterns describing the amount of market work have been studied nearly ad nauseam; we thus refrain from repeating those findings that simply reproduce what others in that vast literature have shown. Instead, we can divide our novel, or at least somewhat novel results into three categories.

A. General findings.

1. While household production falls when time devoted to market work increases, the trade-off is not one-for-one. Both within a country over time and across countries at a point in time, there is no constancy of total work.

2. Fluctuations in aggregate demand alter the mix of total work between the market and the home.

B. EU vs. U.S..

1. Americans enjoy less leisure (not merely less time away from market work) than Europeans. The difference in non-television leisure time is even greater, since Americans watch TV over one-half hour more per day than Europeans.

2. Americans work more than Europeans—the American excess of market work is not fully offset by less home work.

3. Americans mix their activities over the week more than Europeans. Their weekends look more like their weekdays than do those in northern Europe.

4. Market work is more spread out over the twenty-four hours of the day in the U.S. than in the EU or elsewhere.

C. Gender differences.

1. Men and women spend the same amount of time in All Work—the total of paid and unpaid work. This phenomenon holds in the three northern countries we examined, but not in Italy. Sociologists have shown that it appears to be true in most wealthy countries.

---

9A similar calculation by Callister and Dixon (2001) using the New Zealand Time Use Survey shows a pattern that is more tilted toward standard business hours than is Australia’s.
Women spend less time in leisure than men. They spend much more time in household production, slightly more time in tertiary activities.

Gender differences in how people spend time are smaller in the U.S. than in the European countries studied here. This difference is partly due to the lesser difference in market work time in the U.S., partly to a greater similarity across genders in the U.S. in the distribution of time spent outside the market.

Appendix: classification of basic activities into the main aggregates in the eight samples

Note: In many of the survey a very small part of the day was not classified or truly miscellaneous. In each case those totals were prorated across the four main aggregates.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>Employment and job search</td>
</tr>
<tr>
<td>Secondary</td>
<td>Home work activities; handicraft/gardening; care and sitting</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Personal activities; physiological regeneration</td>
</tr>
<tr>
<td>Leisure</td>
<td>Volunteer and other social help; education; contacts/conversation/friendship; media usage/free-time activities</td>
</tr>
</tbody>
</table>

Table 1.7. Germany: 1991/92, 2001/02

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>Professional activities; training</td>
</tr>
<tr>
<td>Secondary</td>
<td>Domestic activities; family care; purchasing goods and services</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Sleeping eating, including at work</td>
</tr>
<tr>
<td>Leisure</td>
<td>Nonwork-related education; religious/civic/political activities; free time. Travel time is prorated across market work, secondary time and leisure in 1988/89, and is specifically assignable in 2002/03</td>
</tr>
</tbody>
</table>

Table 1.8. Italy: 1988/89, 2002/03
### Activity Description

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>Occupational work and related travel</td>
</tr>
<tr>
<td>Secondary</td>
<td>Household work, do-it-yourself, gardening, etc; childcare; shopping</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Personal needs</td>
</tr>
<tr>
<td>Leisure</td>
<td>All else</td>
</tr>
</tbody>
</table>

**Table 1.9.** Netherlands: 1990, 2000

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>All working and work-related activities; travel related to work</td>
</tr>
<tr>
<td>Secondary</td>
<td>Cooking, cleaning, child care, shopping; travel related to these</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Personal care outside the house; eating and drinking; sleeping, sex; travel related to these</td>
</tr>
<tr>
<td>Leisure</td>
<td>Schooling and training; organized activities; entertainment; sports; reading, writing; travel related to these</td>
</tr>
</tbody>
</table>

**Table 1.10.** US: 1985

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td>All working and work-related activities; travel related to work</td>
</tr>
<tr>
<td>Secondary</td>
<td>All household activities; caring for and helping household members; consumer purchases; professional and personal care services; household services; government services; travel related to these</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Sleeping, other personal activities; eating and drinking; travel related to these</td>
</tr>
<tr>
<td>Leisure</td>
<td>Non-household care activities; education; socializing-relaxing-leisure; sport; religious; etc.; volunteering; travel related to these</td>
</tr>
</tbody>
</table>

**Table 1.11.** US: 2003
CHAPTER 2

Explaining the data

In the previous chapter, we have established two fundamental features of time use: *total work*, defined as the sum of time spent on market work and on home production, is almost invariant, in most economically advanced countries, at a given point in time, to gender. Furthermore, the way Americans and Europeans use their time during weekends is strikingly different: US weekends look much more like weekdays than is true in Europe. This chapter explores possible theoretical explanations of these facts.

I. The iso-work fact

In most economically advanced countries, *total work*, defined as the sum of time spent on market work and on secondary activity (or, to use a somewhat more common terminology, the total time spent on market and home production) is almost invariant to gender. This is what we called the *iso-work fact*. Only one country, Italy, is a distant outlier.\(^1\)

To understand the economic content of the equal work fact, it is best to point out what it does *not* mean:

- It does not mean that total work is the same across countries. This is simply not true. There is little support in the data for the Freeman and Schettkat (2005) “marketization hypothesis.”
- It does not mean that total work is constant over time in a given country. Quite the contrary, there is evidence in our data that total work might be sensitive to the state of the business cycle, and it stands to reason that it should have a downward secular trend.
- It does not mean that all individuals choose, in a given country and at a given date, the same allocation of time between market and home production. Time use does depend on gender, but the point is that, in the aggregate, total work does not: gender only affects the division of total work between market work and secondary activity, not its level.

The invariance of total work to gender means that there is a mechanism at work, at a given date and in a given country, that on average leads both

\(^1\)Our total work fact is thus much stronger the Freeman and Schettkat (2005) “marketization hypothesis.”
### Table 2.1M: Time Allocations (minutes), Married People, Means and Their Standard Errors, Men and Women Separately

<table>
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</thead>
<tbody>
<tr>
<td><strong>Market work</strong></td>
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</tr>
<tr>
<td>Men</td>
<td>340.9 (4.8)</td>
<td>269.8 (3.3)</td>
<td>373.5 (3.1)</td>
<td>228.2 (2.9)</td>
<td>266.5 (5.1)</td>
<td>258.6 (5.3)</td>
<td>258.6 (5.3)</td>
<td>314.8 (8.7)</td>
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<td></td>
</tr>
<tr>
<td>Women</td>
<td>253.3 (3.8)</td>
<td>269.8 (2.1)</td>
<td>124.9 (2.2)</td>
<td>95.6 (1.9)</td>
<td>87.0 (2.6)</td>
<td>111.0 (3.1)</td>
<td>159.9 (16.9)</td>
<td>182.4 (3.4)</td>
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<tr>
<td><strong>Secondary time</strong></td>
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</tr>
<tr>
<td>Men</td>
<td>174.0 (2.6)</td>
<td>175.1 (1.8)</td>
<td>94.5 (1.3)</td>
<td>133.7 (1.5)</td>
<td>152.7 (2.7)</td>
<td>155.0 (2.7)</td>
<td>149.9 (4.8)</td>
<td>179.9 (2.6)</td>
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</tr>
<tr>
<td>Women</td>
<td>222.0 (2.3)</td>
<td>336.3 (2.0)</td>
<td>435.5 (1.8)</td>
<td>391.2 (1.9)</td>
<td>321.9 (2.5)</td>
<td>302.3 (2.7)</td>
<td>305.0 (5.8)</td>
<td>313.8 (2.8)</td>
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</tr>
<tr>
<td><strong>Male Total Work - Female Total Work</strong></td>
<td>39.6</td>
<td>-2.5</td>
<td>-92.2</td>
<td>-123.9</td>
<td>10.3</td>
<td>0.3</td>
<td>-0.2</td>
<td>11.9</td>
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<tr>
<td><strong>Tertiary time</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>624.1 (2.3)</td>
<td>655.9 (1.7)</td>
<td>685.2 (1.3)</td>
<td>611.3 (1.4)</td>
<td>623.7 (2.3)</td>
<td>633.6 (2.5)</td>
<td>645.3 (4.3)</td>
<td>609.3 (2.0)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Women</td>
<td>652.4 (1.8)</td>
<td>680.9 (1.5)</td>
<td>663.0 (1.0)</td>
<td>592.3 (1.1)</td>
<td>642.8 (1.8)</td>
<td>660.2 (1.9)</td>
<td>653.3 (3.8)</td>
<td>635.5 (1.8)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Men</td>
<td>309.9 (2.9)</td>
<td>339.1 (2.2)</td>
<td>287.0 (2.2)</td>
<td>466.8 (3.3)</td>
<td>397.1 (3.8)</td>
<td>392.8 (3.8)</td>
<td>329.9 (6.4)</td>
<td>322.5 (3.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>312.4 (2.4)</td>
<td>311.7 (1.8)</td>
<td>216.9 (1.5)</td>
<td>360.9 (1.6)</td>
<td>388.4 (2.7)</td>
<td>366.5 (2.8)</td>
<td>322.6 (5.2)</td>
<td>308.1 (2.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

gender groups to choose the same amount of total work. What could this mechanism be?

**A. Specialization and fairness within the household.** A first possibility is that the equality of male and female total work results from the interaction between optimal specialization and a desire for fairness within the household, as suggested by Table 2.1M.

Imagine, for instance, that John might have a comparative advantage in home production over his lawyer wife Helen. As a result, they have decided that he would be a househusband while she would practice law in a firm. The implicit contract between them stipulates that while John spends his days taking care of the kids and cleaning up the house, Helen should really work, and not spend her afternoon playing golf with her partners. In return, John has promised Helen, who comes back exhausted from a full day at the office, that the kids will be clean, the house tidy and dinner ready when she returns home from the office in the evening. John starts his day of home work when Helen leaves the house, and is done by the time she comes back in the evening. As a result, total work is identical for both spouses in the Helen and John household, but it is allocated differently for each across market and secondary activities. If Helen and John both worked in the market and split housework, they would arrange their working days so that, in the end, they enjoy the same total amount tertiary and leisure activities, i.e., the same amount of total work in the market and at home.

**B. Unmarried agents.** However seductive and intuitive this explanation might sound, it however does not account for another feature of the
I. THE ISO-WORK FACT

Table 2.1U. Time Allocations (minutes), Unmarried People, Means and Their Standard Errors, Men and Women Separately

<table>
<thead>
<tr>
<th>Country</th>
<th>Germany</th>
<th>Italy</th>
<th>The Netherlands</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>226.6</td>
<td>241.1</td>
<td>324.9</td>
<td>348.3</td>
</tr>
<tr>
<td></td>
<td>(5.7)</td>
<td>(5.5)</td>
<td>(5.5)</td>
<td>(3.1)</td>
</tr>
<tr>
<td>Women</td>
<td>182.9</td>
<td>175.0</td>
<td>182.4</td>
<td>171.1</td>
</tr>
<tr>
<td></td>
<td>(4.8)</td>
<td>(3.8)</td>
<td>(4.2)</td>
<td>(2.5)</td>
</tr>
<tr>
<td>Secondary time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>241.1</td>
<td>170.4</td>
<td>58.5</td>
<td>97.6</td>
</tr>
<tr>
<td></td>
<td>(4.3)</td>
<td>(3.5)</td>
<td>(1.9)</td>
<td>(1.4)</td>
</tr>
<tr>
<td>Women</td>
<td>281.9</td>
<td>263.9</td>
<td>237.3</td>
<td>302.0</td>
</tr>
<tr>
<td></td>
<td>(3.5)</td>
<td>(2.9)</td>
<td>(3.0)</td>
<td>(2.1)</td>
</tr>
<tr>
<td>Tertiary time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>633.1</td>
<td>649.3</td>
<td>678.2</td>
<td>580.0</td>
</tr>
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<td></td>
<td>(2.8)</td>
<td>(3.2)</td>
<td>(2.2)</td>
<td>(1.4)</td>
</tr>
<tr>
<td>Women</td>
<td>649.5</td>
<td>665.4</td>
<td>694.6</td>
<td>593.7</td>
</tr>
<tr>
<td></td>
<td>(2.4)</td>
<td>(2.3)</td>
<td>(1.8)</td>
<td>(1.3)</td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>339.2</td>
<td>379.3</td>
<td>378.9</td>
<td>414.1</td>
</tr>
<tr>
<td></td>
<td>(4.2)</td>
<td>(4.0)</td>
<td>(4.5)</td>
<td>(2.3)</td>
</tr>
<tr>
<td>Women</td>
<td>325.7</td>
<td>335.6</td>
<td>326.0</td>
<td>373.2</td>
</tr>
<tr>
<td></td>
<td>(3.9)</td>
<td>(1.6)</td>
<td>(3.2)</td>
<td>(2.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Germany</th>
<th>Italy</th>
<th>The Netherlands</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>222.6</td>
<td>243.6</td>
<td>294.80</td>
</tr>
<tr>
<td></td>
<td>(9.2)</td>
<td>(8.0)</td>
<td>(12.5)</td>
</tr>
<tr>
<td>Women</td>
<td>152.2</td>
<td>217.4</td>
<td>223.5</td>
</tr>
<tr>
<td></td>
<td>(5.1)</td>
<td>(5.2)</td>
<td>(19.3)</td>
</tr>
<tr>
<td>Men</td>
<td>222.6</td>
<td>243.6</td>
<td>294.80</td>
</tr>
<tr>
<td></td>
<td>(9.2)</td>
<td>(8.0)</td>
<td>(12.5)</td>
</tr>
<tr>
<td>Women</td>
<td>152.2</td>
<td>217.4</td>
<td>223.5</td>
</tr>
<tr>
<td></td>
<td>(5.1)</td>
<td>(5.2)</td>
<td>(19.3)</td>
</tr>
</tbody>
</table>

Thus, while the unmarried specialize less than the married, the amount of total work that unmarried men perform is very close to that of unmarried women in a given country and in a given year. This implies that we cannot invoke the interaction of specialization and fairness within the household to explain the equal work fact. There must be a mechanism that coordinates the total time spent on market work and secondary activities across males and females, whether they are married or unmarried.

The simplest coordination device that equalizes total work across agents is a social norm for leisure that serves as focal point for the determination of total work. Peer pressure or a strong desire to conform to social norm for time allocation mute market incentives and weaken the impact of individual tastes. As a result, time use becomes more similar across individuals. If the social norm is strong enough to drive the agent to fully conform, we obtain the equal work result we have observed in the data. Alternative explanations of the iso-work fact are of course possible: all must involve, in one way or another, the interplay between social interactions and individual tastes. The social norm story we tell here is just one instance of social interaction.

---


3In this simple story, total conformity only occurs if the desire to conform is infinitely strong. The literature (Bernheim, 1994) has sought ways to obtain full conformity without assuming an infinite cost of deviance.
II. Social norms for leisure

Imagine that, in the absence of a social norm, the demand for leisure of an agent depends negatively (and linearly) on the wage rate:

\[ L = 1 - \epsilon w. \]

The amount of time available (say, in a week) is normalized to 1, and \( \epsilon > 0 \) measures the sensitivity of leisure to the wage rate \( w \). We call this outcome the agent's intrinsic optimum.

Now suppose that there is a social norm that influences, but does not mandate, individual leisure. We mean by this that agents have the choice of the extent to which they stick to the norm, and optimally balance the marginal costs and benefits of deviating from the norm. The cost of deviating may stem from guilt (an internal psychological process) or shame (an external peer pressure mechanism or reputational mechanism). The benefit of deviating results from the joy of following one's own unbridled inclinations that in general differ from the norm.

Formally, let us measure the strength of the social norm by a coefficient \( \phi \geq 0 \). When \( \phi = 0 \), there is no social norm, and agents choose \( L = 1 - \epsilon w \). When \( \phi = +\infty \), the hold of norm on the agent's behavior is infinitely powerful so that, if we call \( L^* \) the social norm for leisure, agents pick \( L = L^* \) regardless of their \( w \) and \( \epsilon \). For \( \phi \) between zero and infinity, the social norm pulls optimal leisure choice away from \( 1 - \epsilon w \) and towards \( L^* \): Hence

\[ L = \alpha (1 - \epsilon w) + (1 - \alpha)L^* \equiv L(w), \]

with the weight \( \alpha \), between 0 and 1, given by

\[ \alpha = \frac{1}{1 + \phi \epsilon}. \]

---

This would result from the case in which consumers maximize in each period the utility function \( C - (1/2\epsilon)(1 - L)^2 \) subject to the budget constraint \( C = \Omega + w(1 - L) \), where \( \Omega \) is non-labor income.

By assuming \( \epsilon > 0 \), we rule out for simplicity cases in which the labor supply curve is backward-bending. Leisure demand, and labor supply, become wage-inelastic when \( \epsilon \rightarrow 0 \). In that case, our specification implies, somewhat unpleasantly, that \( L = 1 \) so that agents do not work. This could be fixed by writing instead \( L = L_0 - \epsilon w \) with \( L_0 \in (0, 1) \). We keep the formulation \( L_0 = 1 \) in order to lighten the notational burden.

The strength of the norm for an individual may depend on the number of people who have adopted it. We examine this possibility below.

This linear formulation follows from assuming that a deviation from the norm entails a quadratic utility loss, i.e., from maximizing \( C - (1/2\epsilon)(1 - L)^2 - (\phi/2)(L - L^*)^2 \) with respect to \( L \).
The coefficient $\alpha$ is large, and optimal leisure is far from the norm, if the social norm is weak ($\phi$ small) or leisure is not very elastic ($\epsilon$ small). Higher wages, keeping $\alpha$ constant, increase the distance between $L$ and $L^*$. Now assume that male ($M$) and female ($F$) wages differ, but that the wage sensitivity of leisure ($\alpha$) is identical across sexes.\(^8\) The resulting leisure gap between man and women is

$$L^m - L^f = L(w^m) - L(w^f) = -\alpha \epsilon (w^m - w^f).$$

A. Iso-work. Explaining the iso-work fact requires examining under which circumstances the leisure gap $L^m - L^f$ may be zero (or indeed very small). Since $\alpha$ collapses to zero as $\phi$ goes to infinity, this requires that the strength of the norm be infinitely (or very) strong, for

$$\lim_{\phi \to \infty} (L^m - L^f) = 0.$$  

In words, a very strong norm mutes the effect of wages on leisure, and equalizes male and female leisure.

While this result may appear trivial, its derivation reveals what is perhaps the most crucial ingredient of a norm-based explanation of the total work fact: the assumption that men and women share a gender-neutral norm. It is because the leisure norm of males and females is gender-neutral that a larger $\phi$ wipes out the differences between male and female leisure. Were the norm correlated with gender, we would in general observe, ceteris paribus, different male and female leisure even when $\phi = +\infty$. Hence the fact that total work is relatively invariant to gender in high-income countries (but less so in poorer economies) suggests, if the social norm story is correct, that a fundamental change of norms takes place in the process of economic development: gender-neutral, or gender-blind norms replace gender-specific references for leisure (and more generally for consumption).\(^9\)

B. Accounting for variations in total work. The data presented in Chapter 1 make it abundantly clear that although total work is strikingly equal across men and women, it does vary, sometimes substantially, across countries and over time. Since we are arguing that social norms may serve as a coordination device between the total work of males and females, we must

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\(^8\)This last assumption, which is of course at odds with estimates of labor supply elasticities for males and females, can easily be relaxed.

\(^9\)Note that no causal statement is being made here. One can easily write models in which gender-specific norms cause economic backwardness, and models in which competition and development causes gender-equality.
now undertake the task of explaining why norms may vary across countries and dates.

So far, we have treated social norms as *exogenous*. One could argue that this is appropriate because norms reflect moral or religious imperatives that have little or nothing to do with economics. We could then conclude that total work is not the same in all places and at all times because norms vary as a function of culture or circumstances. This would be akin to the account given by Solow (1956) of the secular improvement of GDP per capita: standards of living keep improving, and capital remains productive enough at the margin to justify investment, because technical progress exogenously shifts up the production function over time. This explanation, like Solow’s, would not be trivial: it would focus our attention on norms as the engine of change of total work (changing norms) in very the same way that Solow made us realize that ideas could be the engine of long-run growth.

However, in the same way that bringing back the determination of technological progress within the fold of economics has been a significant milestone for endogenous growth theory, we believe that endogenizing the norms that explain the iso-work fact is the right tack to take.\footnote{This endogenization of norms is at the heart of the recent literature on conformity. See Bernheim (1994).}

To that effect, let us return to our simple model of social norms. Remember that male and female leisure are given by

\[
\begin{align*}
L^m &= \alpha(1 - \epsilon w^m) + (1 - \alpha)L^*, \\
L^f &= \alpha(1 - \epsilon w^f) + (1 - \alpha)L^*.
\end{align*}
\]

Now if we view the gender-neutral norm $L^*$ as reflecting average leisure across males and females in society, and there are equal proportions of men and women in the economy, it must be the case that, in equilibrium,

\[
\frac{1}{2}(L^m + L^f) = L^*
\]

Combining the last three equations and solving for $L^*$, we conclude that the *equilibrium social norm for leisure* is simply

\[
L^* = 1 - \epsilon w^*,
\]

where

\[
w^* = \frac{w^m + w^f}{2}
\]

is the average wage in the whole (male and female) population.

The story we are telling is very simple:
The equilibrium social norm for leisure is independent of its impact on the agent's tastes ($\phi$), but it depends on the sensitivity of individual leisure to the wage ($\epsilon$) and on the average wage rate in the economy ($\bar{w}$). Whenever these magnitudes change, across countries or over time, the social norm for leisure varies.

The extent to which individual leisure ends up in equilibrium close to the social norm depends on the parameter $\phi$. In the limit, when $\phi \to +\infty$, the iso-work fact hold exactly (the leisure gap between men and women is zero).

C. Summary. We have shown that a simple social interaction story—a social norm for leisure—may rationalize the equality of iso-work across genders. The norm itself can be endogenized, which may explain why total work varies so much across countries and over time. Thus, the current European “culture” that favors leisure can be viewed as an equilibrium outcome rather than as a taste difference.

III. US vs. Europe: A model of coordinated leisure

Chapter 1 has documented that Americans work more than Europeans, and that, in addition, the hebdomadal pattern of work differs substantially between the two continents: in contrast with Europe, weekends look a lot like weekdays in the US.

One could of course argue that this is due to differing tastes, but as usual explanations based on unobservable variables are not very persuasive—especially since Europeans actually worked more than Americans as recently as the 1960s, as noted by Alesina, Glaeser, and Sacerdote (2005). Instead, we wish to show that wide divergence in leisure is possible across two otherwise identical economies if one is willing to entertain the possibility that there are leisure externalities across agents.\(^{11}\)

Imagine that consumers prefer, at the margin, spending their free time in the company of others rather than alone, i.e., that individuals have a preference for coordinated leisure.\(^{12}\) This preference for social leisure introduces an additional dimension of strategic complementarity between agents. If a consumer expects others to be working a lot, she prefers to also work (and

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\(^{11}\)In this section, we abandon for simplicity considerations related to social norms.

consume) a lot, as most of the leisure she so foregoes so is solitary and not very valuable. Conversely, a consumer who expects others to rest a lot finds leisure more attractive, as it is more likely that it will be taken in its most valuable, i.e., common, form.

This strategic complementarity leads, under conditions that we will outline below, to multiple Pareto-ranked competitive equilibria. In the presence of a preference for social activities, the economy might end up either in a low-leisure, high-consumption equilibrium, or in high leisure, low-consumption equilibrium. Crucially, welfare is lower in the former equilibrium than in the latter outcome.

To make these points formally, we first examine optimal labor supply and consumption choice of households in the presence of a preference for common over solitary leisure. Second, we determine under which conditions multiple competitive equilibria arise in our economy, and we show how they can be Pareto-ranked. Finally, we characterize the economic rationale and effects of blue laws.

A. Household preferences and the structure of time. The economy consists of a continuum of identical agents distributed over the interval $[0, 1]$. The utility function of a typical consumer is

$$u(C) + v(\ell),$$

where $C$ denotes consumption and $\ell$ is an index of total leisure to be defined below. We assume that

$$u(C) = \begin{cases} 
-\infty, & c = 0; \\
C, & c > 0,
\end{cases}$$

and that $v(.)$ is increasing and concave, with $v(0)$ finite.\footnote{This specification would yield, in a traditional model of consumption and leisure choices, an upward-sloping labor supply curve. It rules out uninteresting corner solutions with zero consumption, as no finite amount of leisure can compensate the consumer for the infinite negative utility felt when $C = 0$. Since $v(0)$ is finite, our model does not exclude, however, solutions with zero leisure. This means that we are only discussing here non-essential leisure, and that time that must be devoted to vital activities (say, sleep) is left outside of the model for simplicity.}

The total leisure index $\ell$ depends linearly on solitary leisure $\ell_s$ (idle time spent alone) and common leisure $\ell_c$ (idle time spent with others):\footnote{The model could be generalized, without significantly affecting the results, to more general utility functions.}

$$\ell = \ell_s + \sigma \ell_c.$$  \hfill (2.2)

\footnote{The assumption of linearity is only made for analytical convenience. All that matters for our results is that neither form of leisure be essential in utility.}
We assume that the parameter $\sigma$ is greater than 1, i.e., that agents find a unit of common leisure more pleasurable than one unit of solitary leisure. Thus, $\sigma$ measures the desire for *conviviality*. Without the assumption that $\sigma > 1$, it would be impossible to plausibly explain why we observe that consumers voluntarily coordinate their leisure activities (husband with wife, parents with children, friends, etc.).\(^{15}\) The case where $\sigma = 1$, in which agents do not distinguish between solitary and common leisure, is the one studied in standard models of consumption-leisure choice.

Assume that the day (or the week) is divided into two shifts: day and night (or weekdays and weekend). The length of each day is normalized to 2, and we assume the two shifts are of equal unit length. Individuals can choose to work in either or both of the shifts.\(^{16}\) Furthermore, assume that shifts are indivisible: an individual either works, or not, during a shift. Labor supply in shift $t = 1, 2$ is thus an indicator variable $x_t$ that takes value 1 if the individual works in shift $t$, 0 otherwise. Hence, total labor supply is $x_1 + x_2$, and the consumer’s budget constraint is accordingly

$$ C = w(x_1 + x_2), \quad (2.3) $$

where we have assumed, for simplicity, the wage rate $w$ to be the same in both shifts. In words, consumption is $w$ or $2w$ depending on whether the consumer works one or two shifts.

Let $X_t$ denote the average labor supply of other agents during shift $t$. In a pure-strategy Nash equilibrium,\(^{17}\) $X_t = 1$ if other agents work is thus

$$ \ell_s = (1 - x_1)X_1 + (1 - x_2)X_2, \quad (2.4) $$

while common leisure equals

$$ \ell_c = (1 - x_1)(1 - X_1) + (1 - x_2)(1 - X_2). \quad (2.5) $$

Obviously, the sum of solitary and coordinated leisure equals $2 - (x_1 + x_2)$, the difference between the time endowment and labor supply.

**B. Multiple equilibria.** We now show that there is a range of wage rates $w$ and of conviviality parameters $\sigma$ for which there are two possible equilibrium outcomes. In one equilibrium, consumers work both shifts and consume a lot. In the other, they work only one shift, consume less and but enjoy coordinated leisure.\(^{18}\)

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\(^{15}\)An alternative, but implausible explanation, would be that there are large economies of scale in leisure.

\(^{16}\)We assume for simplicity that sleep is not necessary.

\(^{17}\)We do not discuss mixed strategy equilibria here.

\(^{18}\)Remember that, because of the way we specified the utility function, it is always optimal to work at least one shift.
If a consumer expects other consumers to work two shifts (i.e., she anticipates $X_1 = X_2 = 1$), she gets utility $2w + v(0)$ if she also decides to also work two shifts, since this results in high consumption but no leisure. Under the same expectation that other will be working non-stop, she gets utility $w + v(1)$ if she decides to only work one shift, as she receives a low labor income and has no choice but to enjoy her one unit of leisure alone (the others being at work all the time).\footnote{In that case, $\ell_s = 1$ regardless of whether $x_1$ or $x_2$ equals 1.} As a result, working two shifts if others work two shifts is an equilibrium if $2w + v(0) > w + v(1)$, that is, when the wage rate is high enough:

$$w > v(1) - v(0).$$ \hfill (2.6)

If a consumer expects others to work one shift, say the first shift, and rest during the second, she gets utility $2w + v(0)$ if she breaks ranks with the rest of the population, works both shifts, and accordingly enjoys high consumption at the cost of no leisure whatsoever. If she chooses instead work for only one shift, like the others, she will always pick the same shift as the others because the desire for conviviality ($\sigma > 1$) makes common leisure more pleasurable than solitary leisure. She will thus end up with low consumption but with one unit of common leisure, which yields utility $w + v(\sigma)$. As a result, working only one shift (and synchronizing leisure with the others) when others are only working one shift is an equilibrium if $w + v(\sigma) > 2w + v(0)$, that is, when the wage rate is low enough:

$$w < v(\sigma) - v(0).$$ \hfill (2.7)

We conclude from inequalities (2.6) and (2.7) that both high consumption with no leisure, and low consumption with common leisure are equilibria if and only if

$$v(1) - v(0) < w < v(\sigma) - v(0).$$ \hfill (2.8)

This is a “Goldilocks inequality:” multiple equilibria are possible if and only if the wage rate is neither so low that it leads consumers to work one period regardless of what the others are doing, nor so high that it encourages them to work both shifts independently of the actions of their fellow citizens.\footnote{When multiplicity condition (2.8) is satisfied, there is also a third equilibrium in which a fraction of the population works two shifts, a fraction works the first shift only, and the remainder works the second shift only. Given these proportions, consumers are indifferent between working full-time, or in one of the two shifts only. We do not study this equilibrium here, since it is unstable: the deviation of a single individual makes the equilibrium collapse to one of the two fully-coordinated equilibria studied in the text.}

What is at work here is again a strategic complementarity. Were solitary leisure less pleasurable than, or as pleasurable as, common leisure ($\sigma \leq 1$),
multiplicity would never arise, as inequality (2.8) could never be satisfied. But as soon as the desire for conviviality makes common leisure more pleasurable than solitary leisure ($\sigma > 1$; i.e., as soon as the common leisure externality is strong enough), and provided the wage is not too extreme, consumers wish to follow each other’s actions. As a result, society might end up coordinating on either an equilibrium with high consumption with no leisure, or on one with low consumption with common leisure.

![Figure 2.1. Multiple equilibria](image1.png)

![Figure 2.2. Welfare](image2.png)

Figure 2.1 illustrates these results in the space $(\sigma, w)$. In region I, a region with high wages in the sense of inequality (2.8), the only equilibrium
is one in which everyone works two shifts and consumes a lot, while low consumption with one period of common leisure is the only equilibrium in the low-wage region III. Multiplicity arises in the “intermediate” region II.

C. Coordination failure. We can Pareto-rank the two equilibria that can arise when the multiplicity condition (2.8) is satisfied. Welfare in the equilibrium with high consumption and no leisure is

\[ 2w + v(0), \]

while utility in the low consumption, common leisure, equilibrium is

\[ w + v(\sigma). \]

But, when inequality (2.8) is satisfied, the latter is larger than the former. Accordingly, the low consumption, common leisure, equilibrium Pareto-dominates the high consumption, no leisure, equilibrium when both are equilibria. We therefore conclude that, when the desire for conviviality is strong (\( \sigma > 1 \)) and the wage is intermediate (condition 2.8), consumers just might end up working and consuming too much for their own good—simply because of the high valuation they place on communal leisure activities! Paraphrasing Schor (1993), we can say that people might truly be “overworked” in equilibrium. Unlike Schor, however, this results from their own preferences and the nature of the externalities. As such, it is more like Akerlof’s (1976) rat-race equilibrium.

Figure 2.2 shows, for a given \( \sigma > 1 \), how welfare changes as a function of the wage rate.

D. Summary. We have shown that preference for coordinated leisure gives rise to multiple, Pareto-ranked equilibria. In the “US” equilibrium, individuals work a lot, consume a lot, and have little time for communal activities. In the “European” equilibrium, consumers work less and consume less, but enjoy more common leisure. The European equilibrium Pareto-dominates the US outcome.

Hence, the reason why Americans today work more than Europeans may not be that Europeans are lazier than Americans. History (e.g., the first oil shock) and institutions (labor-market regulations) might have simply led otherwise identical Americans and Europeans to coordinate on different equilibria—as emphasized by Alesina, Glaeser, and Sacerdote (2005). Americans might nevertheless be crazy, as the low-activity equilibrium with coordinated leisure Pareto-dominates the high-activity outcome in which individuals “bowl alone,” as deplored by Putnam (2000).
Home production, setup costs and welfare

I. The link between market and secondary work

A number of salient facts emerge from our empirical analysis of time use. First, we confirm the stereotype of the “overworked American.” Despite inherent problems with international comparisons of time-use data, Americans do appear to work more, especially in the market. Second, Americans tend to concentrate their work less than Europeans, preferring instead to work all the time, including weekends and at odd hours of the day and night. (They also do this in a more gender-neutral fashion than Europeans). Third, Europeans work relatively more at home than in the market when compared with Americans. Finally, we are intrigued by the fact that, despite all this, both Americans and Europeans tend to spread the volume of total work “fairly”, on average, across gender.

These facts have wide-reaching implications. First and foremost, they imply a central role for secondary work, or home production, in the economic existence of the household. They imply that market and home work are relatively substitutable, at least at the relevant active margin. Furthermore, while differing degrees of marketization of home production is a defining feature of the US-Europe comparison, it is not true that total work is constant across time and space.

It is also true that EU-US differences are significantly smaller for total work than for market hours. German men averaged 436 minutes of All Work in 2001/2, a slump period, compared with 476 minutes in the US in 2003, a period of strong economic growth. Yet German males actually worked more minutes per day in that year in secondary activities (174) than their US counterparts (163). Generally, European time-use data reveal a much larger share of secondary work in total work than in the United States. Explicit consideration of incentives which determine the division of labor within household is necessary to account for this variation. Comparative statics analysis suggests that labor taxation should play an important role in explaining cross country differences in this division. In this section we confirm this suspicion. Just as theory predicts, secondary labor responds to taxation and can account for cross country differences, at least for the G-7 countries considered by Prescott (2004).
In this final chapter, we examine how home production is chosen in the household context and explore the welfare implications of secondary work for households in the EU and US. We begin by reviewing and extending the theory of home production. Since the seminal contribution of Gronau (1977), home production has been recognized as a potential source of valuable, if not always well-appreciated, non-marketed output. The empirical evidence presented in Chapter 1 showed not only that secondary work is a significant component of All Work, but also that it varies widely across households and across persons within households. By gender, average time spent in home production as a fraction of All Work in a given country and year ranges in our data from 31 percent (US men in 1985) to 76 percent (Dutch women in 1990). Moreover, the iso-work hypothesis implies that at a point in time within a country, market and secondary work will tend to be negatively correlated across individuals and especially across individuals within families.\footnote{For example, the correlation coefficient between daily market and secondary work across all individuals in the German 2001/2 time use survey was -0.41, and -0.57 in the 1991/2 survey. In a sample pooling the two years, the correlation was -0.40 for unmarried women, -0.42 for unmarried men, -0.51 for married women, and -0.49 for married men.}

The existence of secondary work has important implications for welfare assessments of the costs of business cycles and unemployment. After considering the economics of secondary work in the household, we evaluate welfare implications of secondary work and the role of non-convexities in the market versus work decision. There are good theoretical reasons to suspect that the decision to move from no market work (and thus all secondary work) to some market work involves the expenditure of time and material resources. This suggests a natural econometric test, namely to see whether the decision to work changes the allocation of time in a smooth fashion or in fact "disrupts" the allocation of time and material resources to other activities. We then conclude with some speculation as to what we can say about these EU-US differences in work and time use.

II. Household labor supply with home production

A. A simple toy model. In this section, we present a simple version of the theory of home production and its implications for total labor supply
II. HOUSEHOLD LABOR SUPPLY WITH HOME PRODUCTION

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("All Work"). The objective is to understand how expanding the range of choices taken by the household affects the labor supply to the market and at home. We begin by thinking about a household as a single decision-making unit; it is straightforward to extend the theory to include specialization among members, possibly such that each is specialized in one type of labor.

To capture the most important aspects of the household’s decision when home production is available, we study a simple extension of the linear-quadratic “toy model” introduced in the previous chapter to give a flavor of the principal economic effects under consideration. We abstract from all discussion of norms. The utility of the household is given by the following separable function of consumption \( C \) and leisure \( L \):

\[
C = \frac{1}{2e}(1 - L)^2, \tag{3.1}
\]

Consumption \( C \) is the sum of the consumption of market goods \( C_M \) and home production \( C_H \). The assumption of perfect substitutability of home production with market goods is an important one which allows us to convey the most important aspects of the model in a simple diagram. If the household works \( M \) hours in the market at a real, gross-of-tax hourly wage \( w \), and \( \tau \) is the rate of labor taxation including social contributions, then goods purchased in the market must obey the budget constraint

\[
C_M = (1 - \tau)wM + \Omega, \tag{3.2}
\]

where \( \Omega \) stands for non-labor income or wealth. To avoid corner solutions, we will assume that \((1 - \tau)w < \frac{1}{e}\). Home production requires input of secondary labor according to

\[
C_H = \theta \ln(H + 1) \tag{3.3}
\]

where \( \theta \) is a productivity shift term. Again, to simplify matters, we assume \((1 - \tau)w < \theta < 2(1 - \tau)w\). Note that \( H = 0 \) implies that \( C_H = 0 \).

\[\text{The classic references are Becker (1965) and Gronau (1977, 1986). Benhabib, Rogerson, and Wright (1991) show conditions under which the model with home production can be replicated by the standard neoclassical growth model.}

\[\text{Separability is an important assumption, and is not innocuous in models of home production. Greenwood and Hercowitz (1991) replace leisure with “home produced” goods and services which enter utility non-separably with market-purchased commodities. In contrast, we will treat secondary time as an input to a production function for home consumption goods. Separability of utility over goods and leisure is necessary (but not sufficient) for stationary steady states in environments with economic growth (King, Plosser, and Rebelo, 1988).}

\[\text{This assumption will guarantee that the worker always works some positive number of minutes at home (} H > 0 \text{) but not the entire day (} H < 1 \text{). Later we shall consider the case of } H = 1 \text{ in more detail. Upon substitution of (3.3), the utility function (3.1) is given by}
\]
The central aspect to be captured is declining marginal utility or declining efficiency of home production. While most of us would find too much home production unpleasant, most are willing to do some of it, so the first few units of consumption obtained from home production are usually much cheaper than those purchased in the market. The assumptions made here guarantee that the household always works some hours at home ($H > 0$), yet always supplies some labor to the market ($M > 0$). Imposing $\epsilon(1 - \tau)w < 1$ guarantees that the household takes some leisure as well ($L > 0$).

Maximization of utility (3.1) subject to the budget constraint (3.2) and the home production function (3.3) yields the optimal secondary work input by the household:

$$H = \frac{\theta}{(1 - \tau)w} - 1.$$  
(3.4)

The home production decision turns out to be separable from the total and market work decisions; this follows from the fact that market and household goods are perfect substitutes. The household’s optimal use of time in secondary work depends negatively on the net of tax return to work $(1 - \tau)w$ and positively on productivity at home $\theta$. At the margin, the household equates the output of an additional hour of home production to the opportunity cost of that time in the market, the net-of-tax wage. High-wage households will tend to cut back on household production and purchase substitutes in the market, so that the higher income is “eaten up” to some extent by a higher effective cost of living. Households with lower opportunity costs of time in the market will engage in more home production for market goods and services, such as meal preparation, laundry, child-care, and house-cleaning.

All work is given by:

$$H + M = \epsilon(1 - \tau)w$$  
(3.5)

and market hours by

$$M = 1 + \epsilon(1 - \tau)w - \frac{\theta}{(1 - \tau)w}.$$  
(3.6)

Labor supply to market is positively influenced by the net wage, positively by the insensitivity of utility to work $\epsilon$, and negatively by productivity in $\theta$. Is indistinguishable from $C_M + \ln C_H$, with the home production function for given by $C_H \equiv (H + 1)^\theta$.

The separability property generalizes to those problems in which the substitution elasticity between home and market goods is very high, and when workers do not choose a “corner” solution. See the Appendix for more details. For a thorough discussion of other implications of imperfect substitutability of market and home production, see Gronau (1986).
II. HOUSEHOLD LABOR SUPPLY WITH HOME PRODUCTION

Home production. The elasticity of labor supply is higher, possibly significantly higher than it would be without home production. Labor supply to the market is positive, even if $\epsilon = 0$. The toy model also excludes the possibility of a backward bending supply curve. There is no income effect of a wage change - total supply supply always reacts nonnegatively to a net wage increase.

In this model, the household always works strictly positive minutes both at home and the market. Figure 3.1 depicts this special case in terms of the standard analysis of a household’s labor supply decision. The assumption of perfect substitutability of the two consumption goods allows us to aggregate them conveniently in the diagram (alternatively, consumption $C'$ denotes an aggregator of market goods and home production). The household, with preferences summarized by the familiar indifference curves in the figure, has three alternative uses of time: it can supply secondary work to home production $H$ shifting out the budget set commensurately as long as the marginal productivity exceeds the net wage for the first minutes worked. Given the availability of market work at the after-tax wage rate, the household should allocate time to market and secondary work so as to equate the net returns from both activities. This results in a "pasting" of the market budget line with the home production function at the point where the slope of the latter is equal to $-(1 - \tau)w$. Home production, insofar as it is more productive than the market wage, leads to an expansion of the budget set for the household and an increase in its welfare. The extent of this expansion is smaller, and the size of the household production sector larger, the greater the rate of taxation faced by labor, or the lower the gross wage, ceteris paribus. Thus we would expect large home production sectors not only in developing countries, but also in OECD economies with high labor tax burdens (including social security contributions and value-added taxes).

B. Some general comparative statics propositions for the Gronau model. The home production model is generally more complex than the impression conveyed by Figure 3.1. Comparative static analysis of market, secondary and total work to changes in market prices, productivity, wealth and other determinants does not always yield unambiguous results. This is especially true if market and home consumption are not highly substitutable. Nevertheless, the case of perfect substitutability—which is the assumption behind Gronau (1977)—is a good starting point for analysis and finds some support in one sparse set of data (Benhabib, Rogerson, and Wright, 1991). In this section, we summarize the
most important features of that model in terms of the elasticities of the allocation of time in the household with respect to the effects of wages, labor taxes, wealth and home productivity.\footnote{See the Appendix. The elasticities are derived from log-linearized versions of the first-order conditions of the formal problem. For simplicity, we consider only interior solutions in which positive amounts of market, household and leisure time are observed. This is entirely consistent when the model is viewed as a stand-in for the representative or average household in the economy. Later we will consider corner solutions explicitly.}

a. \textit{Household production.} For the more general version of the Gronau model, the following results can be shown for the household which is supplying time both to the market and to household production activities:

\begin{enumerate}
  \item \textit{The supply elasticity of secondary work (home production) with respect to the gross-of-tax market wage is unambiguously negative.}
  \item \textit{The (uncompensated) supply elasticity of secondary work with respect to labor taxation is unambiguously positive.}
  \item \textit{The elasticity of secondary work with respect to an improvement in home sector productivity is positive if that productivity is labor augmenting.}
  \item \textit{Wealth, or non-labor income more generally, has no effect on secondary employment.}
\end{enumerate}

The economic mechanisms behind these propositions are straightforward, and some have already been discussed in the context of the simple
II. HOUSEHOLD LABOR SUPPLY WITH HOME PRODUCTION

model. As the opportunity cost of working at home (the net market wage) rises, less of it is performed. Thus, an increase in the net wage - caused by either a decrease in the tax rate or, holding taxes constant, an increase in the gross wage - decreases incentives to engage in household production. Conversely, an increase in taxes (or a decrease in the gross market wage, given taxes) decreases incentives to work in the market at the expense of secondary work. In Figure 3.2, we depict the effect of an increase in the rate of labor taxation (which is equivalent to a decrease in the gross wage, ceteris paribus).

While it is true that a higher marginal product of household work will lead to more time devoted to home production, it is important also to remember that technical progress in home production can involve increases in average productivity while simultaneously decreasing marginal productivity of labor at given input, i.e. labor-saving technical progress. Productivity in secondary work will affect the allocation of time across uses in the market and at home. Increases in productivity which are labor-augmenting (think of a better set of kitchen knives, a high-quality convection oven or a home cinema system) will increase the attractiveness of home production at previous inputs, and thus increase labor input at the chosen optimum. In contrast, labor-saving technical progress (a microwave oven, a vacuum cleaner or an electric hair blow dryer) will reduce the time supplied to that activity.

Finally, as long as some work is performed both in the market and at home (i.e. an interior solution), the margin of market and secondary work is determined by pure efficiency considerations: non-labor income does not affect the household’s optimal choice of home production. While it is easy to criticize this assumption, the correct sign is by no means clear, and will depend on whether home production is a normal or inferior good. Good arguments can be adduced in favor of both hypotheses.

b. Market work. The determinants of household production also affect the household’s decision to work in the market. As in the standard theory of labor supply, substitution and income effects of wage changes act in opposite directions. The difference here is that they are augmented by a possible reallocation of time between market and home work. The effects of various exogenous variables on market hours $M$ can be summarized as follows:

M1. The sign of the uncompensated elasticity of market work with respect to the gross-of-tax wage is ambiguous, but larger than in the absence of secondary work.
M2. The sign of the uncompensated elasticity of market work with respect to labor taxation is ambiguous, but smaller than when secondary work is absent.

M3. The elasticity of market work with respect to non-labor income or wealth is unambiguously negative.

M4. The elasticity of market work with respect to all forms of secondary work productivity is negative.

c. All work. We now turn to the reaction of All Work and leisure to changes in market wages, in labor taxation, in the productivity of home production, and of wealth. It is worth noting that the elasticity of total work with respect to some variable is a weighted average of the respective elasticities of market and secondary work, with the weights corresponding to the shares of the two types of work in total work time. Given the ambiguity for market work and the unambiguous results for household production, it would be surprising if the reaction of total work to the wage and to taxation yielded unambiguous answers. In fact, the results of the previous sections developed in the Appendix to this Chapter show that total work elasticities are values for the market work elasticities “shrunk” by the factor $M/L$. Thus, an increase in non-labor wealth and in home productivity unambiguously increase leisure and decrease total labor supply (total

\[ \text{Home Production} \]

Figure 3.2. Effect of a Labor Tax Increase in the Gronau Model
work). As expected, total work is an ambiguous function of the net wage—
depending on whether the income or substitution effect dominates. Indeed,
the predicted negative elasticity of total work with respect to wealth is con-
sistent with evidence over longer periods presented by Aguiar and Hurst
(2006), who document a secular increase in leisure, measured as the com-
plement of total work, since the 1960s. They associate this with a dramatic
drop in household work in the US, due both to increases in after-tax, real
wages as well as to labor-saving technical progress in home production (see
Greenwood, Seshadri, and Yorukoglu, 2005).

d. **Summary.** The central results can be summarized as follows:

- Secondary work (home production) is an unambiguously positive
  function of the tax rate and labor augmenting productivity in home
  production. It is an unambiguously negative function of the real
  before-tax wage. For interior solutions, secondary work is inde-
  pendent of both non-earned income/wealth.
- Market work depends negatively on non-labor income/wealth, and
  on productivity in household production, but depends ambig u-
  ously on the after-tax wage.
- For interior solutions, the effect of the gross market wage and of la-
  bor taxation on market work is ambiguous, as would be expected;
  an increase in the wage induces incentives to work more (the sub-
  stitution effect) but also to work less (the income effect). The pres-
  ence of household production, however, unambiguously increases
  the (arguably) magnitude of the supply elasticity of market hours.

**C. Empirical evidence: Labor taxation and household production.**

Both the toy model as well as a more general version studied in the Ap-
pendix contain a simple, empirical prediction shown in Figure 3.2: the reac-
tion of household production to market incentives—here, wages and labor
taxes—should be much stronger and unambiguous than that of All Work or
market work. This is because, plausibly, while offsetting income and sub-
stitution effects are operative for total work (and thus for leisure), only the
efficiency-driven substitution effect is relevant for the household produc-
dtion decision. The literature has generally confirmed predictions of this
type using micro data (see Gronau, 1986, for examples), but to our knowl-
edge this test has not been confronted with cross-country data.

This line of thinking is suggestive of the following empirical specifi-
cation for observations in country $i$ for gender grouping $j \in \{m, f, all\}$

---

8In the model we consider, tax revenue is not rebated to the household. With a rebate
(or purchase of substitutable public goods), the elasticity of market labor supply should rise,
as in Prescott (2004).
(male, female, all pooled):

$$\ln(H/M)_{ij} = a + b \ln w_i + c \ln \tau_i + u_{ij}.$$  

This relation can be derived from a more general version of the model in which market and home-produced goods are not perfect substitutes. The prediction of the model is that $b$ and $c$ have indeterminate signs, but that $c$ is more likely to be negative due to the existence of home production.

For a number of reasons, especially given by the recent discussion about “lazy Europeans” initiated by Prescott (2004), it seems reasonable to consider the same G7 countries, which have similar economic sizes, wealth levels, etc., so that other determinants can be relegated to the constant term $a$. Table 3.1 displays the data. Estimates of the model presented for each $j \in \{m, f, all\}$ are presented in Table 3.2. The elasticity with respect to the tax rate is positive and ranges between 1.25 and 1.70; moreover, it is highly significant for women and insignificant for men. This follows the prediction of the Gronau model both in the aggregate and individual level, since women in these countries tend to supply less labor to the market and more to secondary activities than men do. At the same time, an indicator of the hourly wage was never significant. Thus, using the Prescott (2004) data and a model extended to account for an obvious and elastic margin, we are able

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**Table 3.1. Labor Taxation, Manufacturing wages, and average market and secondary work, G-7 countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Labor tax rate</th>
<th>Avg. gross mfg. earnings ($/hr), 2000</th>
<th>Avg. minutes of market work (M)</th>
<th>Avg. minutes of secondary work (M)</th>
<th>Avg. minutes of market work (F)</th>
<th>Avg. minutes of secondary work (F)</th>
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</thead>
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<tr>
<td>Canada</td>
<td>0.52</td>
<td>16.5</td>
<td>270</td>
<td>102</td>
<td>168</td>
<td>264</td>
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<td>France</td>
<td>0.59</td>
<td>15.5</td>
<td>227</td>
<td>136</td>
<td>145</td>
<td>233</td>
</tr>
<tr>
<td>Germany</td>
<td>0.59</td>
<td>23.7</td>
<td>263</td>
<td>174</td>
<td>133</td>
<td>312</td>
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<tr>
<td>Italy</td>
<td>0.64</td>
<td>13.8</td>
<td>327</td>
<td>80</td>
<td>131</td>
<td>365</td>
</tr>
<tr>
<td>Japan</td>
<td>0.37</td>
<td>22.0</td>
<td>404</td>
<td>80</td>
<td>204</td>
<td>248</td>
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<tr>
<td>UK</td>
<td>0.44</td>
<td>16.7</td>
<td>245</td>
<td>123</td>
<td>156</td>
<td>221</td>
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<tr>
<td>US</td>
<td>0.40</td>
<td>19.7</td>
<td>313</td>
<td>163</td>
<td>201</td>
<td>271</td>
</tr>
</tbody>
</table>

Note: Labor tax rate is taken from Prescott (2004, Table 2). Wage is total compensation per hour in 2000 in manufacturing industry, in US dollars, published by the US BLS. Minutes of market and secondary work are taken from the constituent country studies taken used in the paper. Data and dates of relevant survey are described in the appendix to Chapter 1.

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9Suppose households maximize utility given by $\ln[\alpha (C^M)\rho + (1 - \alpha) (C^H)\rho] - v(M + H)$, where $v()$ is some convex function of All Work, subject to a budget restriction (3.2) and with linear household production $C^H = \theta H$, and let $\Omega = 0$. Then it is straightforward to show that optimal choice implies

$$\ln(H/M) = \frac{1}{1 - \rho} \left[ \ln \left( \frac{\alpha \theta \rho}{1 - \alpha} \right) \right] + \frac{\rho}{1 - \rho} \ln w + \frac{\rho}{1 - \rho} \ln (1 - \tau).$$
III. HOUSEHOLD LABOR SUPPLY WITH SETUP COSTS OF WORK

Table 3.2. Secondary-Market Work Ratios and Labor Taxation in the G-7

<table>
<thead>
<tr>
<th>Dep. variable</th>
<th>Const.</th>
<th>ln(w)</th>
<th>ln(τ)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>0.1485</td>
<td>1.579</td>
<td>0.037</td>
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<tr>
<td>(1.03)</td>
<td>(1.45)</td>
<td></td>
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</tr>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>-0.5412</td>
<td>1.095</td>
<td>-0.199</td>
<td></td>
</tr>
<tr>
<td>(5.23)</td>
<td>(1.81)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>1.430</td>
<td>0.1284</td>
<td>0.782</td>
<td></td>
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<tr>
<td>(0.196)</td>
<td>(0.279)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>0.8289</td>
<td>0.1386</td>
<td>0.754</td>
<td></td>
</tr>
<tr>
<td>(0.946)</td>
<td>(0.328)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>0.8809</td>
<td>1.159</td>
<td>0.565</td>
<td></td>
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<tr>
<td>(0.284)</td>
<td>(0.391)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\ln(H/M)_{int})</td>
<td>0.1220</td>
<td>0.3162</td>
<td>0.478</td>
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<tr>
<td>(1.410)</td>
<td>(0.532)</td>
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</table>

Note: OLS cross-sectional regressions, N=7. For details on data, see Table 3.1.

III. Household labor supply with setup costs of work

A. Motivation. The analysis of the last two sections examined the intensive margin and the response of market, secondary and total work to changes in incentives. Yet it is well-known that the extensive margin comprises up to three-quarters of variation of labor input over the business cycle. Our analysis can be fruitfully extended to include the extensive margin - the participation decision - in the presence of fixed costs, especially when the utility gain from additional employment in secondary activities is non-negligible. In Chapter 1, we saw that European households tend to work more at home than in the market on average. Could it not also be the case that they concentrate their nonemployment on a smaller number of individuals or households, as a rational response to relative prices and institutions in their respective countries?

In the previous section, we showed that labor taxation, which is only imposed on market hours, is more likely to affect the distribution than the overall level of hours worked (“All Work”). This is because standard theory predicts that given that one is already working positive hours, the home production decision is likely to be governed by efficiency considerations.

\[^{10}\]This result is meant to be illustrative. Data limitations - poor comparability of larger cross-sections of country data and restricted availability of essential household covariates (e.g. taxes) within countries - precluded a more detailed analysis of labor supply at this stage, which we leave for future work.
so the elasticity of substituting secondary for market work should be high. Evidence from the G-7 countries supports this conclusion.

In this section we explore a related aspect of the home production decision. In general, the decision to work in the market entails discrete, one-time setup costs or costs of “reorganizing one’s life” which must be expended regardless of whether that work is part-time or full-time (see Cogan, 1981, for a seminal analysis of monetary costs of this type). These costs lead to non-convexities in the budget constraint, which have received considerable attention in the macro literature (Hansen, 1985; Rogerson, 1988; Cho and Rogerson, 1988).11 Most obviously, going to work entails an increase in tertiary time dedicated to taking better care of one’s appearance and health, getting more (or less) sleep, and possibly changing eating habits.

Less obvious but equally relevant, taking up market work can lead to abrupt shifts in the time devoted to household production. Going to work often means skipping or economizing on cooking, house-cleaning, gardening and child-care that would have occurred in constant amounts in any event. As a result of fixed costs, taking up market work could also mean more household production, however, necessitating certain types of shopping or the production of certain personal services which, for any number of reasons, might be unavailable or too expensive to purchase in the market. Going to an office job usually requires wearing well-pressed shirts and blouses; in many continental European countries with high minimum wages, product market regulations and binding environmental restrictions, these services are expensive and border on being a luxury.

In what follows, we sketch a model with a rich structure of such setup costs, first graphically, then formally, using an extension of the toy model of previous sections. We then use this model to motivate an econometric analysis of the impact of going to work in the four data sets we have examined. In the concluding section we summarize the implication of home production, fixed costs of going to work and more generally external effects for welfare.

B. A model of household labor supply with fixed setup costs: A graphical representation. Typically, setup costs that households incur when they work positive market hours introduce non-convexities in the budget constraint relevant for the labor supply decision Cogan, 1981. These costs can take the form of material resources or time. This means shifting the market budget line in Figure 3.1 down or to the left, respectively, while consumption

---

11A non-convex budget set is one which does not contain all linear combinations of its elements. For example, working overtime only pays extra for the last hours worked, or going to work requires the expenditure of time and money from the first minute on.
possibilities at zero market labor supply \((M = 0)\) remain at their previous level. When home production is possible, the attractiveness of not working in the market is further enhanced, especially for households with two or more workers, with the potential for specialization Cho and Rogerson, 1988. In general, the first hours spent in home production are the most productive ones, so this option is likely to encourage some agents to achieve high levels of utility without working in the market at all.

The effect of fixed costs on the labor supply decision is summarized in Figures 3.3 and 3.4. The figures are drawn such that preferences are identical in both cases—the difference arises entirely from the opportunity costs of time, summarized by the net real wage available from working in the market, which in turn depends positively on the nominal real wage \((w)\) and the tax rate \((\tau)\), but also on shifts in the budget set induced by “setup costs.” In the first case depicted in Figure 3.3, the net returns to market work time are high, and the household chooses to work more in the market than at home, using market income to purchase goods and services. The circled tangency point of consumption-leisure indifference curves with the linear segment of the budget set yields higher utility to that household, despite the shift downward and inward of the budget set implied for any positive value of market work \(M\)
In Figure 3.4, the net returns from market work are low. The household opts for no market work at all, working exclusively at home \( M = 0, H > 0 \). Even though an hour of work—as household production—is relatively unproductive at the margin, the household achieves a level welfare higher than that attainable from using the labor market, as seen by the higher level of utility at the encircled tangency point.

Under which conditions are agents likely to exclude market work entirely? In the next section we formalize, in a fashion analogous to the norm model elaborated in Chapter 2, the household’s decision as a choice between maximizing utility working positive market hours \((M > 0, H > 0)\) versus not working at all \((M = 0, H > 0)\).

C. A formal model of fixed setup costs. As before, the household is the decision-making unit, but now it faces a richer structure of costs. Utility is given by \((3.1)\), with \( C = C_M + C_H \), and home production is determined by \((3.3)\). Now consider the following modifications: First, any positive amount of market work implies a series of one-off shifts in the effective time delivered to all activities. For any choice of leisure \( L \), only \((L - \Psi_L)\) is actually

---

\(^{12}\)It is important to stress that the net real return from market work is not only determined by the gross wage and taxes, also by the relative price of market goods to home production.

\(^{13}\)This could be extended to a multiple-person household with specialization Cho and Rogerson, 1988, with some members working exclusively in the market and others specializing in home production.
III. HOUSEHOLD LABOR SUPPLY WITH SETUP COSTS OF WORK

In the language of the first chapter, this might be thought of as a fixed loss of planned leisure or tertiary time necessary for work ($\Psi_L > 0$), or the time actually freed up by working ($\Psi_L < 0$). Consider personal maintenance time. In principle, going to work could require more time (getting more restful sleep each night, shaving every morning), or less (shorter showers, less sleep on weekdays). Where this time comes from in the end is left up to the household.

Similarly, working in the market may imply a one-off shift in the amount $\Psi_H$ of the effectiveness of secondary time $H$. For a given home production technology, this is equivalent to a fixed expenditure of home production (think of the very first shirt that needs to be ironed). There is no reason to assume that $\Psi_H$ is always positive - the first cup of coffee might have to be taken away from home. Finally, for any positive market work, only $M - \Psi_H$ is actually delivered and is compensated at the net-of-tax market wage.

Under these assumptions, the home production function reads

$$C_H = \theta \ln(H + 1 - \Psi_H),$$

with the restriction $\frac{\theta}{(1 - \tau)w} > 1 - \Psi_H$ imposed to preclude negative $C_H$. The time restriction $M + H + L = 1$ continues to hold. Under these conditions, it can be shown that optimal choice for households which choose positive market work is given by

$$M = \epsilon (1 - \tau)w - \frac{\theta}{(1 - \tau)w} - \Psi_L - \Psi_H + 1$$

$$H = \frac{\theta}{(1 - \tau)w} - 1 + \Psi_H$$

$$L = 1 - \epsilon (1 - \tau)w + \Psi_L.$$  

A positive value of $\Psi_L$ reduces minutes of market work and increases leisure. Analogously, $\Psi_H$ depresses market work and increases household production, ceteris paribus. The fixed loss of work time $\Psi_M$ does not appear in these expressions, but it affects at the extensive margin, as do $\Psi_L$ and $\Psi_H$. Note that all $\Psi$’s are measured in terms of time (i.e. minutes).

For those who do not work in the market, we have (for small $\theta$ and $\epsilon$):

$$H = \sqrt{\frac{1}{4} + \theta \epsilon - \frac{1}{2}} \approx \theta \epsilon$$

---

14 Here, we continue to consider leisure as the sum of tertiary time and leisure in the narrow sense. The model is easily extended to capture the distinction made in Chapter 1.

15 For simplicity, we have grouped leisure and tertiary time together. Allowing $\Psi$ to take negative or positive values may be interpreted as deviations from a fixed “base” requirement of tertiary time.
L = 1 - H = \frac{3}{2} - \sqrt{\frac{1}{4} + \theta \epsilon} \approx 1 - \theta \epsilon,

so secondary labor supply is independent of the market wage, but positively related to both home productivity and the disutility of work.

To understand the extensive margin decision, consider that indirect utility for an interior solution with positive market work ($M > 0$) is

$$\Omega + \frac{\epsilon}{2} (1 - \tau)^2 w^2 + \theta \left[ \ln \left( \frac{\theta}{(1 - \tau) w} \right) - 1 \right] + (1 - \Psi_L - \Psi_H - \Psi_M) (1 - \tau) w, \quad (3.7)$$

while utility when not working ($M = 0$) is given approximately by

$$\Omega + \frac{\theta^2 \epsilon}{2}. \quad (3.9)$$

Hence, an approximate threshold for the household to work in the market can be computed as

$$1 + \frac{\epsilon}{2} ((1 - \tau)^2 w^2 - \theta^2) + \theta \left[ \ln \left( \frac{\theta}{(1 - \tau) w} \right) - 1 \right] > \Psi_L + \Psi_H + \Psi_M \quad (3.10)$$

By inspection, all three shift parameters $\Psi_i$, when positive, reduce market participation, i.e., to less use of the extensive margin. Higher gross wages, lower tax rates and lower productivity at home will increase participation in market work.

Since the $\Psi_i$ are unobservable, we can only examine their implications indirectly by inferring changes in minutes of alternative uses of time implied by market work ($M > 0$). In particular, the model predicts that the difference between secondary and leisure time between labor market participants and non-participants will obey:

$$H_{M>0} - H_{M=0} = \frac{\theta}{(1 - \tau) w} - 0.5 + \Psi_H - 0.5 \sqrt{1 + 4 \theta \epsilon}$$

and

$$L_{M>0} - L_{M=0} = 0.5 - \epsilon (1 - \tau) w + \Psi_L + 0.5 \sqrt{1 + 4 \theta \epsilon}$$

In an econometric specification explaining minutes of secondary, tertiary or leisure time, these differences might correspond to estimated coefficients of a dummy variable which takes the value of 1 if any market work was

\[16\text{A first-order Taylor expansion of the function } \sqrt{\frac{1}{4} + \theta \epsilon - \frac{1}{4}} \text{ around } \theta \epsilon = 0 \text{ yields the approximation } H \approx \theta \epsilon. \text{ Now insert this into utility when working at home to obtain } \Omega + \theta \ln(1 + \theta \epsilon) - \frac{1}{2 \epsilon} (\theta \epsilon)^2 \approx \Omega + \frac{\theta^2 \epsilon}{2}. \]
recorded. These coefficients will depend on $\Psi_i$, but also on home productivity, the net wage, and the wage sensitivity of utility to work. In addition, the unobservable $\Psi_i$ may be correlated with the disturbance term as well as with individual explanatory variables leading to potential biases. Thus, the next section will focus on presenting some first estimates of such shift terms and establishing the importance of these costs.

D. Empirical evidence: Estimating costs of market work. In this section, the four principal countries’ time-use data sets—Germany, Italy, the Netherlands and the US—are employed to study setup costs arising from market work as well as “where working time comes from,” that is, which alternative uses bear the burden of adjustment of market time at the intensive margin. This is potentially important for welfare analysis. It could be argued, for example, that Europeans rationally concentrate their unemployment by restricting labor force participation, and economize on fixed costs associated with working. If these costs are significant, welfare gains might be realized by concentrating unemployment on the young and less skilled, who are likely to have a comparative advantage at home production anyway. In addition, the estimated coefficients could also allow us to draw conclusions about welfare, since the $\Psi_i$ directly reduce indirect utility for those who continue to work and move households at the margin out of market employment.

We will work with a specification suggested by Hamermesh (2006a), who examines issues related to fixed costs of work in a similar framework for the effect of ageing on the labor supply decision. The model in the last section considered three different uses of time, while the data sets deliver a fourth—tertiary time—which might be considered “partially unavoidable” leisure (eating, personal hygiene, sex, and sleep fall into this category). In the empirical work that follows, we allow for separate consideration of both conceptualizations of leisure. As might be expected, there are differences, and these are sometimes significant and merit additional analysis and interpretation.

The econometric model is a system of three equations relating the minutes allocated by an individual to each of secondary, tertiary and leisure activities, as defined in Chapter 1, to (i) minutes spent in market work, (ii) an indicator variable indicating whether any time was worked in the market, as well as a number of controls that are as similar as possible across the data sets. By construction—and by nature of the survey, which leaves none

---

17 Controls for the US regression: age, age squared, race, children 0-2, children 3-5, children 6-13, children 14-17, gender, marital status, spouse’s work hours. Controls for Germany: age, age squared, spouse’s age squared, marital status, gender, marital status x gender, children in the household younger than 5, children in household between 5 and 17.
or very little time unaccounted for—the estimated coefficients on (i) across the three equations sum to -1, while the market work coefficients associated with (ii) will sum to zero. Because the equations are based on weighted observations, the estimates reflect the relevant effects on a representative day of the week. The results are presented in Table 3.3.

Turning first to the question “where does the working time come from?” we find that all coefficients on minutes of market time are negative, just as in Hamermesh (2006a) analysis of US data, and are all highly significant and significantly different from each other, strongly suggesting qualitative differences in taking time from leisure than from secondary or tertiary activities. Remarkably, the rank ordering of the coefficients is the same for all data sets except Germany 1991: the burden of an extra minute of market work falls most heavily on narrowly-defined leisure, followed by secondary time, with the smallest sacrifice coming in terms of tertiary time. It is interesting to note that the absolute value of the leisure-cost coefficient is the largest in Italy (-0.56 to -0.59), followed by the Netherlands (-0.46 to -0.49), then the US (-0.45), and Germany (-0.34 to -0.39).

Now we turn to the time shift coefficients, which are not identical to $\Psi_M$, $\Psi_H$ and $\Psi_L$ in the setup cost model, but can be mapped into these fixed time cost parameters. The model predicts that positive values of these fixed costs would generate shifts in the time allocated to the major categories of activity whenever a person begins market work. In contrast to the coefficients on the volume of market work described above, the estimates of the

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<tbody>
<tr>
<td>Dep. var.</td>
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<tr>
<td>Secondary</td>
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<td>-28.98</td>
<td>-34.44</td>
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<tr>
<td>Minutes</td>
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<td>0.29</td>
<td>0.31</td>
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<td>Tertiary</td>
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<td>Minutes</td>
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<td>Leisure</td>
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<td>-2.89</td>
<td>-2.18</td>
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Test $\chi^2 (2, p$-value in parentheses)

BI $\beta_{\text{sec}} = \beta_{\text{ter}} - \beta_{\text{leis}} = 0$

Controls for Italy: age, age squared, marital status, sex, marital status x gender, children in household younger than 5, children in household between 5 and 17, and spuworkm. Controls for Netherlands: age, age squared, spouse's work hours, age of spouse, age of spouse squared, marital status, gender, marital status x gender, children in household younger than 5, children in household between 5 and 17.
discrete shifts due to market work do not exhibit simple common patterns. In continental Europe, working in the market is associated with lost tertiary time (most probably sleep, but possibly also bathing and eating). For example, in Italy on an average day, working in 2002/3 meant a sacrifice of 24 minutes tertiary time, as well as a reduction of one half-hour of household production. On the other hand, taking up market work in Italy is associated with an increase in leisure of almost one hour! Among other things, this could reflect the increased propensity of working Italian women to reduce or defer cleaning and other chores, to delegate them to other household members, or to purchase these services in the market.

In the US, market work comes primarily at the expense of leisure (between 17 and 22 minutes and statistically significant) while tertiary time use increases and secondary time falls or remains constant. In the Netherlands and Germany, in contrast, working in the market is associated with a significant increase in secondary time at the expense of tertiary and leisure time. In practice this might take the form of ironing one’s clothes more often and forsaking the daily shower and shave or makeup session. Interestingly, in the later data set for the Netherlands, this country appears more like the United States in terms of fixed leisure loss of work, and more like Germany in terms of the increase in secondary time. Again, these estimates should be seen in the context of country-specific institutions such as market regulations, public provision of work-related services, subsidies (including mass transit).

There are a number of issues that arise in the econometrics of estimating such an system, which we are glossing over. In the first instance, wages, taxes, household productivity and measures of preferences are important theoretical determinants of the allocation of time in its various uses and are not included directly. Treating the decision to work in the market, and given that, the number of hours to work as predetermined seems like a heroic simplification. Yet, re-estimating our specification on various sub-samples of the data, especially those individuals with positive but low hours in the market, does not result in significantly different estimates. As Hamermesh (2006b) finds for the US, very modest involvement with the labor market implies significant reallocations of time for individuals. These reallocations are likely to be associated with welfare costs. Without knowing much more about preferences, however, it is difficult to quantify those costs.

IV. Summary

This chapter has examined the distinction between home production and leisure in still more detail. In Chapter 1, we saw that unremunerated work takes up a significant fraction of an average individual’s day, both in
Europe and the US. While women tend to perform more household work than men, this asymmetry is shrinking in most countries—with the possible exception of Germany—as more women enter the labor market. By definition, household production does not involve a formal market, and therefore represents a degree of freedom facilitating the All Work/leisure norm studied in Chapter 2.

Can the existence of the household production option explain why Americans work more in total than Europeans? Not really. As long as market goods and secondary output are readily substitutable at the margin, theory does not yield such a prediction for All Work. Overall labor supply is determined by the net market price of labor, non-labor income and wealth, plus norms which can condition labor supply at any given set of incentives. The theory can however, tell us why Europeans tend to spend more a greater fraction of their time in household production as a fraction of All Work. In the first instance, all factors affecting the real, take-home wage for market work will affect the choice of household production versus market work. These include labor taxes and the relative prices of commodities most easily substituted using home production: child care, gardening, home cleaning, food preparation and cooking. Our simple cross country analysis of the G-7 countries does suggest a strong association of the fraction of household work in All Work with the rate of labor taxation used by Prescott (2004) to study the determinants of market hours in the context of a calibrated growth model. A more thorough investigation would need to examine international differences in product market regulation and governmental subsidies of services.

A skeptic might argue that this is not remarkable, given that Europeans are more likely to be unemployed and have lower overall employment and labor force participation rates. While unemployment is likely to be one determinant of household production in the short run, it cannot explain certain patterns in the countries we examine. It cannot explain, for example, why German men in 1991/2 worked a mere 11 minutes less in the market than US-American men in 1985, both periods when real growth in both economies was virtually identical (3.5-4 percent per annum), while German men worked one full hour more than American men in home production.

Labor taxation is one plausible explanation that has been invoked elsewhere to explain the low absolute level of market time in OECD economies (Daveri and Tabellini, 2000). Yet the high taxation is only one possible distortion against market work that might distinguish Europe from the US. It

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18For example, Benhabib, Rogerson, and Wright (1991) show that home production is countercyclical.
is well-known that growth of the European service sector has been lackluster compared with the US, and many have cited labor and especially product market regulations as a cause. It is interesting to note that the Scandinavian countries do not fit the pattern of the G-7, and this is likely due to the high level of subsidy of child care for working parents and public services, despite high income taxation, which effectively raise the real net return from working in the market relative to the European continent.\footnote{Schneider and Enste (2000) have argued that the underground economy can explain a large component of the EU-US labor and product market divide. Davis and Henrekson (2005) link the size of the underground economy in rich countries to the overall level of taxation. To the extent that survey respondents declare time in their diaries as secondary when in fact it is primary could also account for the secondary-heavy European orientation. In fact, the especially large underground economy in Italy (estimated at 15-20 percent) offers yet another explanation for their lone violation of the iso-work fact: Italian men are reluctant to admit to this activity for fear of detection by the fiscal authorities.}

The data from Chapter 1 suggest not only that Americans work more hours and have higher levels of labor force participation than most EU citizens, but they also work more odd hours and more on weekends. If so, is that necessarily efficient? It could be, if fixed costs associated with market work are significantly lower in the US than in Europe. Estimated fixed costs of starting market work suggest that these costs are high in Europe, especially the additional burden of household production in Germany and the Netherlands, as compared with the US (Italy is, as usual, \textit{sui generis}). Moreover, lower gasoline and automobile taxation in the US mean lower transportation costs and probably also tilt the decision at the extensive margin to work in the market there. Tax and social insurance systems in EU countries often introduce significant fiscal costs of secondary worker’s market participation.

The real issue is whether Europeans bear significant welfare costs for working so much at home as opposed to in the market. Answering this question requires us to revisit issues raised in Chapter 2 as well as in this chapter. We will return to this in our concluding remarks and resume of the report. Indeed, both serious and not-so-serious research has valued home production at a significant fraction of total national income.\footnote{In an early NBER study, King (1923) assessed the value of services performed by in the United States at the beginning of the 20th century at one-quarter to one-third of national income. In a frequently cited estimate, Gronau (1980) estimates that the value of home production represents roughly two-thirds of total household income. More recently, the internet website salary.com estimates that the market value of services provided by “stay at home moms” was $134,121 annually, an increase from $131,471 in 2005. “Working moms” would earn $85,876 for the home production component of their work.} If these estimates are valid, home production certainly mitigates the lost value of the European slump, as well as the business cycle in general. Home production...
may not be as efficient in Europe as it could be if delivered by the market, yet the problem may indeed be, to quote Tobin, more an issue of Harberger triangles than Okun’s rectangles.

Appendix: More general formulation of the Gronau model

In this appendix we consider a household with more general preferences than the toy model in the main text, but maintaining perfect substitutability between market goods and home production. The household maximizes utility, deriving from separable consumption $C$ goods and leisure $L$:

$$u(C) + v(L, L^*).$$

Consumption is the sum of market and household production: $C = C_M + C_H$. The utility function has the standard properties. In particular, we require that $u(\cdot)$ and $v(\cdot)$ are increasing and concave in their arguments: $u' > 0$, $u'' < 0$, $v_L > 0$, and $v_{LL} < 0$; $v_{L^*}$ is left unrestricted, although generally assumed that $\text{sign}(v_{L^*}) = \text{sign}(L - L^*)$. The parametric “leisure norm” argument $L^*$ is anchor for the utility of leisure. If the household works $M$ hours at real, gross-of-tax hourly market wage $w$, and $\tau$ is the rate of labor taxation including social contributions, then market goods obey the budget constraint

$$C_M = (1 - \tau)wM + \Omega$$

where $\Omega$ stands for non-labor income or wealth. Household production $C_H$ requires labor input $H$ according to

$$C_H = \theta f(H),$$

where $\theta > 0$ is a productivity shifter and $f'(H) > 0$, $f''(H) < 0$. Finally, the overall time restriction implies $1 = M + H + L$. Focusing on interior solutions, the problem reduces to:

$$\max_{M,H} u[(1 - \tau)wM + \theta f(H) + \Omega] + v(1 - M - H, L^*).$$

First-order conditions are given by:

$$(1 - \tau)wu'(C) = v_L(L, L^*)$$

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21Separability is an important assumption, and is not innocuous for its treatment of time in home production. Rather than considering secondary time as leisure, we treat it as an input to a production function for home consumption goods, and assume perfect substitutability of market goods and home production. Benhabib, Rogerson and Wright (1991) adduce arguments for perfect substitutability of market and home-produced consumption goods. Moreover, separability of utility over goods and leisure is necessary (but not sufficient) for stationary steady state property in environments with economic growth. See King, Plosser, and Rebelo (1988).

22As noted in the text, productivity can also be labor saving, for example in the form $C_H = f(\theta H)$. See Gronau (1986) for more details.
It follows immediately that
\[ (1 - \tau)w = \theta f'(H) \tag{3.13} \]
Let \( \widehat{x} \equiv dx/x \) denote percentage deviations from equilibrium values. Log-linearizing and the first-order conditions (3.11) and (3.12) around the optimum yields the following system of equations expressing \( \widehat{H} \) and \( \widehat{M} \) as a function of exogenous influences \( \widehat{\theta}, \widehat{\tau}, \widehat{\Omega}, \theta, \) and \( L^* \):

\[
\begin{bmatrix}
\gamma \frac{CH}{C} + \frac{\nu H}{\rho L} \frac{(1-\tau)wM}{C} + \frac{\nu M}{\rho L}
\end{bmatrix}
\begin{bmatrix}
\widehat{H} \\
\widehat{M}
\end{bmatrix}
= \begin{bmatrix}
\left( \rho^{-1} - \frac{(1-\tau)wM}{C} \right) \left( \widehat{\theta} - \widehat{\omega} + \frac{\tau}{1-\tau} \widehat{\tau} \right) - \Omega \widehat{\Omega} + \frac{CH}{C} \widehat{\theta} - \frac{\zeta}{\rho} \widehat{L}^*
\end{bmatrix}
\]

where:
\( \eta \equiv -\frac{Hf''(H)}{f'(H)} \), the curvature of the home production function
\( \gamma \equiv \frac{HF'(H)}{f'(H)} \) is the elasticity of home production to employment;
\( \rho \equiv -\frac{u''(C)C}{u'(C)} \) is the curvature of utility derived from consumption;
\( \nu \equiv -\frac{v_L L}{v_L} \) is the curvature of utility derived from leisure;
\( \zeta \equiv \frac{v_L L^*}{v_L} \) is the elasticity of the marginal utility of leisure with respect to the leisure norm. The solution is
\[
\widehat{H} = \eta^{-1} \left( \widehat{\theta} - \widehat{\omega} + \frac{\tau}{1-\tau} \right)
\]
\[
\widehat{M} = \Delta^{-1} \eta \left[ \left( \rho^{-1} - \frac{(1-\tau)wM}{C} \right) \left( \widehat{\theta} - \widehat{\omega} + \frac{\tau}{1-\tau} \right) - \Omega \widehat{\Omega} + \frac{CH}{C} \widehat{\theta} - \frac{\zeta}{\rho} \widehat{L}^* \right] - \Delta^{-1} \left( \widehat{\theta} - \widehat{\omega} + \frac{\tau}{1-\tau} \right) \left( \frac{CH}{C} + \frac{\nu H}{\rho L} \right)
\]
where \( \Delta \equiv \eta \left( \frac{(1-\tau)wM}{C} + \frac{\nu M}{\rho L} \right) > 0. \)

The propositions in the main text concerning home production and market work follow directly from the last two equations. We then use the fact that the elasticity of total work with respect to any variable \( x \)
is a weighted average of the elasticities of market and secondary work: 
\[
\overline{1 - L} = \frac{M}{M + H} \frac{\hat{M}}{x} + \frac{H}{M + H} \frac{\hat{H}}{x},
\]
and the elasticity of leisure \((L)\) is a rescaling of 
\[
\overline{1 - L} \hat{L} = \frac{1 - L}{L} \frac{\hat{L}}{x},
\]
to summarize the influences on total work and leisure as follows:
\[
\overline{1 - L} = -\frac{L}{1 - L} \left[ \alpha_1 \left( \hat{w} - \frac{\tau}{1 - \tau} \right) + \alpha_2 \hat{\Omega} + \alpha_3 \hat{\theta} + \alpha_4 \hat{L}^* \right]
\]
and
\[
\hat{L} = \alpha_1 \left( \hat{w} - \frac{\tau}{1 - \tau} \right) + \alpha_2 \hat{\Omega} + \alpha_3 \hat{\theta} + \alpha_4 \hat{L}^*
\]
where
\[
\alpha_1 = -\frac{\rho^{-1} \frac{(1 - \tau)\hat{w}M}{\frac{M}{C} + \frac{1 - \tau}{\rho}}}{\frac{M}{C}} \leq 0
\]
\[
\alpha_2 = \frac{\Omega/C}{\frac{M}{C} + \frac{1 - \tau}{\rho}} > 0
\]
\[
\alpha_3 = \frac{C^H/C}{\frac{M}{C} + \frac{1 - \tau}{\rho}} > 0
\]
\[
\alpha_4 = \frac{\zeta/\rho}{\frac{M}{C} + \frac{1 - \tau}{\rho}} > 0.
\]
General conclusion

The rise in unemployment in Europe has attracted the attention of continuing generations of economists since the 1970s. Even as a number of European countries—Ireland, Denmark, the Netherlands, and the United Kingdom in particular—have brought unemployment rates back to levels of the 1960s and early 1970s, the major continental European economies, including France, Germany, Italy and Spain, seem to have accepted high unemployment as inevitable. In response to this development, some economists argued that Europeans have different tastes for leisure than Americans. Others blamed high, almost punitive rates of labor taxation and the welfare state. Still others have pointed to equilibria which, while unambiguously inferior, are the outcome of political processes in which a majority of political actors or voters can block any effort to reform.

The emphasis on unemployment as an indicator of well-being may be misplaced, since it represents only an absence from the labor market, which is a modest time commitment in most modern economies. In 2003, the average man in the US spent about 22 percent of the average day in market work, compared with 35 percent in sleep, 24 percent in leisure and 11 percent in secondary labor activities; for women, these proportions were 14 percent in paid work, 35 percent in sleep, 23 percent in leisure and 19 percent in secondary (home production) activities.

It thus seemed useful to gather systematically more general stylized facts about time use in a number of countries. In one respect, the data confirm what we already knew: Americans do work more than Europeans, and they tend to work at odd hours of the day and on weekends more often than Europeans do. Our detective work turned up an even more interesting aggregate regularity in high-income countries which had gone generally unnoticed and, by economists, uninvestigated: the iso-work fact. The sum of market and home work for men and women tends to be equal at a point in time, even while this may change over time and differ across countries. In the US example above, both men and women in 2003 spent a third of their

\[ \text{For recent contributions to this debate, see for instance Blanchard (2006) and Nickell, Nunziata, and Ochel (2005).} \]
time on All Work. In Germany, men and women spent about 30 percent of their average day in All Work.

The iso-work fact is challenging for economic theory for a number of reasons. First, economic theory should be able to explain why total work differs so little at the aggregate level between genders, when there is so much variation within-gender. Since the market offers little hint at the rationale for such a coordination mechanism, we propose social norms in Chapter 2 and investigate the power of this theory to explain the facts. Second, All Work is the sum of two different types of labor with sharply different productivities—why should their sum be equal across gender, without regard to the mix? In Chapter 3, we examine the theory of home production, especially to allow for both norms as well as fixed costs of market work. These fixed costs have a significant impact on the labor supply of households. Indeed, the most commonly invoked models of home production imply a high elasticity of substitution between market and home work for those households in which both market and home work are performed. We are able to validate this sensitivity in our finding of a high elasticity of response of female home work to labor taxation in the G-7 countries.

This fact makes home work a useful “sink” that enables members of society to meet the norm. Yet under certain conditions, the norm may be difficult to adhere to. If market work is not very productive or market wages are low relative to home production, or if fixed costs are high, households may choose to perform only home work. In this case, only very costly norms will lead to iso-work, especially across genders.

We hope that the data that we have assembled and analyzed, the stylized facts on time use we have established, and the theoretical vistas we have opened will prove valuable to labor economists and macroeconomists alike. Our claim that social influences are a crucial and heretofore little noticed determinant of labor supply and time use, for both single and married agents, is likely to awaken the interest of labor economists.\footnote{Norms in labor supply represent a logical solution to one of the most uncomfortable challenges to labor economics: explaining why the standard workweek appears to enforce itself, even in European countries without explicitly legislated standard workweeks.} The theory and empirics of home production have already attracted the attention of macroeconomic theorists, who have recognized their potential role in the propagation and the cost of business cycles. The reason is that non-convexities in household budget sets increase the relative importance of the extensive margin for labor supply in cyclical fluctuations, which accounts for three-fourths of total fluctuations in hours in the US (Cho and Rogerson, 1988).

Note that we have said nothing about the thorny issue of the “double burden” of market and home production by working women. Even though
men and women perform the same total work in the aggregate, the types of market and secondary activities that they perform do differ, sometimes considerably. It would seem unwarranted, then, to draw welfare inferences from the iso-work fact at this stage. We have no choice, however, to reiterate the central importance of household production for an economy and the role of labor taxation in shaping that importance. Such work—be it child care, garden work or house-cleaning—probably represents the largest labor tax loophole granted to households. Furthermore, it is largest in precisely those countries which tax labor most heavily. It is noteworthy that in economies in which both males and females are heavily involved in the labor market—Denmark and Sweden for example—the government has actively intervened to offset the negative incentives created by high labor taxation by providing day care and related services for working mothers.

Overall, the issue of whether Europeans are lazy or Americans are crazy seems of second-order importance relative to understanding the determinants of individual behavior. A more useful, scientific approach is to assume that underlying tastes are common to both continents, while technologies, institutions, or interpersonal influences like norms or externalities may differ and evolve differently. The fact that Americans work on weekends or more often at odd hours of the day may simply represent a bad equilibrium that no individual agent can improve upon—and would certainly not wish to deviate from, given what all others are doing. Especially if norms and other externalities are important (recall the model of common leisure in Chapter 2), one should recognize that the invisible hand may lead agents to places like this. If our claim that social effects play a central role in the determination of economic activity is confirmed by new data and/or further work, policy makers and economists alike will have to remember that multiple equilibria, and social multipliers, are more likely to determine the impact of labor market policies and taxes rather than the implications of more traditional models.
Bibliography


Publishing, Amsterdam.


This is an ambitious paper that goes over a very large number of data and uncovers many facts and interesting regularities. It then tries to rationalize some of these findings with interesting models. The most creative aspect of the paper is the attempt at going beyond standard characterizations of work, leisure, employment, unemployment, etc. This indeed made me think quite a bit. However, this is not the paper I was hoping to read, because I was interested in slightly different questions.

What I would like to do in my comments is first describe the paper that I would have written, or at least the questions I would have tried to answer. Then I will discuss what I have learned from this paper about the questions I would have asked. Then I will conclude with some comments on what the paper has accomplished.

Let me begin by describing the paper which I would have written and the questions which I would have asked. First, I would have reviewed and expanded upon the evidence of the sharp reduction in market work hours in Europe relative to the United States since the early seventies. I would have tried to assign some weight to the three existing arguments used to explain this fact. The three explanations that have been suggested are: (i) the increasing marginal tax rates, and the associated substitution effect away from market work (Prescott); (ii) increasing per capita income in Europe and income effect on leisure (Blanchard); (iii) a combination of union-imposed policies, regulation, market imperfections and social norms and social multipliers (Alesina, Glaeser and Sacerdote).

In addition to disputed theories there are also some disputed facts. Aguiar and Hurst argue that Americans take much more leisure than we think; they are simply more efficient at doing it, so one unit of “leisure” takes less time in the U.S. Freeman et al. instead argue that Europeans work much more than we think, namely, they work at home rather than in the market.
The paper I would have written would have analyzed the disputed facts, "cleaned up the facts," so to speak, and assessed the results to discuss the relative merits and weight of the existing theories discussed above, or perhaps proposed new ones.

What have I learned from this in that respect? First, I learned that Freeman’s claim that Europeans work just as much as Americans, but work at home rather than in the market, is exaggerated. It is true that Europeans spend a bit more time than Americans in household work but that cannot explain all, or most of, the difference. I have not seen much in the paper about the rather vastly cited paper by Aguiar and Hurst. I would like to have seen this paper discussed more but my sense is that even though Americans may take more leisure than we think they certainly take less leisure than Europeans.

As for the theories, the authors dismiss Blanchard’s views too quickly on the basis that it is based upon assumptions about differences in utility functions on the two sides of the Atlantic. Maybe they are right, but I see no reason why we should exclude a priori that the income effect on leisure is stronger in Western Europe than in the U.S. However, the result, that indeed Europeans work at home more than Americans, is at odds with Blanchard’s view that it is all explained by preference for leisure. But I would like to have seen more of quantitative analysis. Namely, given the facts uncovered how much (or how little) of the difference in market hours of work can be explained by an income effect on leisure?

The paper hardly mentions taxes as an explanation for how people choose to spend their time, so it is hard to see how much this paper supports or contradicts Prescott’s view. The emphasis of the authors on complementarities in leisure, multiple equilibria, and social norms is consistent with the spirit of the analysis by Alesina, Glaeser and Sacerdote. I would like to have seen a bit more of a comparison between the two approaches and in particular I would like to have seen more labor regulations.

The bottom line is that I have not learned much about the questions I had in mind reading this paper, but I readily recognize that this is not a fair criticism, since this is “their” paper, not mine!
So let me turn to some comments on what the authors accomplish. They devote a lot of effort disentangling what people do when they are not working in the market. I think that there are some conceptual problems with this attempt. To begin with, virtually every activity I can think of at home is partly leisure, partly work, with the share depending upon individual preferences. Think of cooking, child care, fixing the garage door, reading a book vaguely related to your market work. More importantly, this uncertainty about classification is not random and may lead to an underestimation of leisure. How much an individual consider activity leisure even if it involves a part of household work is positively correlated to how much time the individual spends in this activity. If you especially like children’s company, you do a lot of child care, but if you hate cooking you delegate it to someone else in the family who finds it relaxing (some people do!). If you like reading you read books that may be helpful for your market work, if you prefer listen to music that may have no effect on your productivity at market work.

There are also some measurement problems. One is misrepresentation, more or less intentional. I bet husbands overestimate how much time they spend helping their wives in cleaning the house, (I do) overestimate how much time they spend having sex, and they underestimate the time spent watching TV.

The bottom line is that I am not 100 percent sure exactly what we gain by trying to disentangle down to the minute whether someone is cooking or reading or fixing the garage door, given that all of the above contain an uncertain fraction of leisure and housework a fraction which is not measurable and varies amongst individual.

Let me now turn to some specific theme touched in the paper. First is the importance of home production. This is a welcome reminder for all of us who use comparisons of macro data. Consider a country, call it Sweden, where Ms. A works at the home of Ms. B to take care of her children, and vice versa. These services are entered into GDP statistics. Consider another country (call it Italy) where Ms. A and Ms. B stay at home caring for their own children. These services do not enter into GDP statistics. This is important, but the paper reads too much as if home production can substitute a lot of market production. Second, the paper makes a truly big deal of the discovery that by and large men and women work the same amount. First of all, I would like to be sure that this is indeed a fact, and it
is not culturally dependent. I would like to check with a much larger sample of countries with different religions, cultures, even geographies.

The fact that married men and women work the same amount is not overly surprising given an interfamily bargaining about work inside and outside the home. The author, however, finds it extraordinary that single men and single women also work the same amount. I do not find this that surprising either. First, they are subject to the same labor regulations regarding their market work. Second, if they live alone they need a similar amount of time for household chores. Third, many single men like to take leisure with single women and they need to coordinate on that. I do believe that social norms are important, but the fact that men and women spend the same amount of time working is oversold as a test of that.

In fact, and this is my third point, let me turn to the discussion of social norms, multiple equilibria, and related discussions. I like this part of the paper quite a bit. I would like to have seen more discussion, bringing in perhaps history, culture, and politics, about why the U.S. and Europe end up in different equilibria. In their discussion about these equilibria the authors show a tendency to emphasize cases in which the European equilibrium is superior. I think that it should be clear that in most cases we cannot make unambiguous Pareto comparisons.

Fourth, the authors engage in a “battle” against working on weekends and at odd hours, which is considered “bad.” Since Americans do more of this than Europeans, the latter somehow got it right. One may argue that, for instance, more work on weekends implies more shops and business open, benefiting all of those who take leisure shopping or need to take care of various necessities of housework (buying a tool to fix the garage door) because their work on week days. The fact that less stringent labor regulations allow people to keep “odd” hours may help in the internal organization of the family. I disagree with the value judgment given by the authors on this point. One of the many reason why I chose my job is because I can work at odd hours.

More generally it seems that the authors have the belief that the Europeans got it right. Their social norms regarding market work, home work, leisure, etc. are superior to American social norms. But if this is so, Europeans should be happier than Americans. There exists indeed a vast literature that studies happiness; we know that international comparisons of happiness are extraordinarily difficult in
general, and with specific reference to work hours. Alesina, Glaeser and Sacerdote have provided some very tentative and preliminary results on this point. Perhaps these authors could have pushed a bit further.

In conclusion, the paper tackles a fascinating topic, examines a very large amount of data and has many interesting modeling insights. I wish the paper had focused a bit more on the determinants of market work.
This paper contains a wealth of information about the uses of time in the four countries in its sample, the United States, Germany, Italy and the Netherlands. It emphasizes non-market time, which is welcome in light of the emphasis on market time in both theoretical and empirical labor economics. It is thorough in its summary of data but thoroughness comes at the cost of narrower coverage in terms of number of countries and surveys per country. The narrower choice does not allow inferences about changes over time, and the paper focuses more on differences between gender and across countries. It suggests ways of modelling the allocation of time that is apparently consistent with the evidence found in the surveys.

Our commonly held beliefs about work in America and Europe are confirmed – that there is about as much work to do in the home as there is in the market, that men do more work in the market and women more in the home, that Americans work more than Europeans, that Americans work more in the evenings and weekends, they watch more television… and so on. It appears that despite the poorer data available, the surveys by Juster and Stafford (1991) and the book by Robinson and Godbey (1997) anticipated correctly the results of this more careful study.

The paper is focused on one fact, which it calls the “iso-work” fact: on average, men and women work the same number of hours when work includes both market work and home work. This fact has been around as long as time-use surveys have, but has not been studied by economists. Leeds in 1917 sampled 60 households in Pennsylvania and found that on average women worked a total of 56 hours per week and men a total of 55 hours. He also found considerable within gender inequality. Freeman and Schettkat (2005) report virtually identical number of hours for each gender for the European Union and the United States, about 60 hours each. And Robinson and Godbey (1997, p. 107-109) report results for 14 countries and summarise them thus: “… it is clear that, with the exception of Austria, Bulgaria, and Italy, gender equality in regard to total time in productive activity prevails in most Western countries.” They credit a “remarkable invisible hand” for this balance. The number of hours of productive activity is about 50 hours a week for each gender; interestingly, in only one country men work more than women, by a tiny margin, Denmark.
Is this feature of the data important and if so, why? Unfortunately, I am not convinced by the remarks related to this question that are made in the paper. Obviously, given the human aversion to inequality – other things equal – gender equality is better than inequality, on the assumption that time out of work gives pleasure and time in work does not. But other things are not equal and there is a lot of within-gender inequality hidden underneath this average fact. Why is it significant, or even interesting, that on average the inequality washes out? Along which dimensions is there inequality and does it matter?

I would have preferred a more disaggregated approach to the problem. Is there equality between the partners in a household? Is there equality between those in the labour force and those outside? Do parents with small children work more or less than others? These are important questions for policy. For example, many countries have legislated maternity and paternity leave. They also give tax breaks for parents. Knowing whether parents work more or less after the arrival of their child could guide policy. Robinson and Godbey (1997) report that in America employed women work about 17 hours a week more than non-employed women; employed men work a remarkable 26 hours more than non-employed men; yet on average women work 53.2 hours per week and men 53.1! It is clear in this case how the averaging comes about: there are more non-employed women than men. Which of the averages is more interesting, the one about all men and women, or the ones about each working category separately? The iso-work fact holds for one but not for the others.

The authors investigate the iso-work fact along one dimension, marital status. They find that gender equality holds on average for both married people and unmarried. But they overlook the fact that it does not hold across the types: married people work a lot more than single people. Why is the within-type equality more interesting than the between-type inequality?

One approach to a more disaggregated analysis of the iso-work fact is to run a regression with individual data of total work on gender, hours of market work, marital status, whether the person has a job or not, age, year, children and other controls. I believe the authors have data for all these variables in all their surveys. What do they tell us about total work? Are the coefficients on gender, market work and marital status zero, as the theory of social norms would imply? I very much doubt it, both by introspection and in light of the findings of Robinson and Godbey with American men and women.

The authors’ use of two surveys for each country that are 15 years apart gives them an opportunity to look at some changes in the uses of time, but not much seems to have occurred during this time. In one case that a surprising result comes up they do not trust it. They find that leisure has gone down in the United States between their two surveys. But reject this finding in
favour of the findings of Aguiar and Hurst (2005) that leisure has increased since 1965. More remarkably, they reject the Freeman-Schettkat thesis of “marketization”, partly on the basis of the argument that “it stands to reason that [total work] should have a downward secular trend”. This might be a correct claim, but I do not see it in their surveys. Others, e.g., Francis and Ramey (2005) have argued that leisure in the United States has been more or less constant for over 100 years, but only on average; it changed within broad groups.

I would also have liked a more thorough analysis of the marketization versus the “engines of liberation” (Greenwood, Seshadri and Yorukoglu, 2005) effect on female labour supply. When I recall my parents’ home when I was growing up, and I look around mine now, I find the engines of liberation argument appealing. But it is implausible for some time-consuming home production activities. For example, people eat a lot more in restaurants now than they used to, the engines of liberation argument would imply otherwise. Marketization is equally plausible, not necessarily in the static cross-sectional sense of complete equality across countries but in the dynamic sense, as the factor behind the changes in hours of market and home work and as the main explanation of differences in market work across countries.

Knowing the microeconomics behind the equality of averages is also essential for the construction of good models to explain the facts. The authors dismiss too quickly conventional explanations of the iso-work fact. I was not convinced by their model of social norms. Social norms are plausible, but in most cases the distance between the assumptions required for the social norms and the results is very short. It is not surprising that assuming that there is social pressure on people to take the same number of hours of leisure leads to an equilibrium that has little variation in leisure time. Can a model of this kind explain why there are apparently such big differences between the total work of employed and non-employed people, or between married and unmarried people? What happens in households where only one of the partners has a job? Is the total work of each still the same? Regrettably, the authors of this paper did not provide facts of this kind, which would be vital in the construction of a good theory of the allocation of time. Why is a model of social norms better than one with complementarities in both consumption and leisure between partners? It does not have to be between married couples. If we assume that the vast majority of people have a partner (be it spouse, lover or soul-mate), and they get more enjoyment both in the consumption of goods and in their leisure time when they do it together, we will get the outcomes of the social norms models.

The way the social norms model is used to “explain” the differentials between Europe and America is also unconvincing. The argument is that there are complementarities in leisure that lead to multiple equilibria, one with more leisure and less consumption (Europe) and one with less leisure and more consumption (America). But the data do not support such a hypothesis. Recall that
in 1960 Europeans worked more hours than did Americans. Did a switch happen at some point in the 1970s, following the usual-suspect shocks, as argued in this paper? The data suggest a smooth transition over a 25 year period (see figure 1).

The model of chapter 3 takes a different stand from the one in chapter 2. Although there is mention of social norms, it is really immaterial for the model. The same results could be derived from a conventional model of the type used in the analysis of steady growth with leisure (e.g., King, Plosser and Rebelo, 1988; Ngai and Pissarides, 2006). The model in this chapter is essentially one of marketization of home production. The choice is between the two work types, on the basis of the post-tax wage and the productivity of home production. In the empirical chapter 1 this force was more or less rejected as the predominant one influencing labour supply, a rejection which I thought was premature. Here it gains prominence.

Much is made here of a cross-country regression with seven observations. It would have been preferable to show the scatter plot here, than report formal regression tests, which are practically meaningless. In this table there appears to be a strong marketization force for women. Interestingly, Freeman and Schettkat found a similar substitution between home and market work for women, but not for men. The authors of this paper also find strong tax effects. But the discussion of tax effects ignores the spending programmes financed with the revenue from the taxes. Since results could differ by a big margin under alternative assumptions about the uses of the tax revenue, it is hard to accept the results presented here at face value. The implicit assumption is that all tax revenue is wasted by the government – in contrast to Prescott (2004), who assumes that no tax revenue is wasted. Both assumptions are too extreme to be plausible.

More possibilities are explored in regressions reported in chapter 3, which I found the most interesting part of chapters 2 and 3. The result here is that at the margin, market work comes at the cost of leisure. Intuitively it is hard to accept such a statement beyond (perhaps) small marginal variations. Whatever happened to the engines of liberation? I do believe that the inclusion of both a participation dummy and hours of work is misleading. I can see that an agnostic will want to keep them both in the regressions because they are statistically significant, but the fact that sometimes the coefficient on the dummy is negative, sometimes positive, is puzzling. What does it really mean? Can it really be that when a person goes out to work he or she watches less television but still spends the same time cooking, cleaning and doing garden work? This would go against the results reported in Godley and Robinson, against the findings of Freeman and Schettkat, against the time trends of Aguiar and Hurst, and against our intuition. Why the difference? Don’t people who go out to work hire a cleaner and don’t they eat more in restaurants?
References


Figure 1. Percent difference between hours of work of the United States and selected European countries, 1960-2003
PART II

LABOUR MARKET EFFECTS OF WORK-SHARING ARRANGEMENTS IN EUROPE

BY

Francis Kramarz (ENSAE, France)
Pierre Cahuc (ENSAE, France)
Bruno Crépon (ENSAE, France)
Oskar Nordström Skans (IFAU - Institute for Labour Market Policy Evaluation)
Thorsten Schank (Universität Erlangen-Nürnberg)
Gijsbert van Lomwel (CentER, Tilburg University)
André Zylberberg (CNRS and École Polytechnique)
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 illustrate these points, we examine specific countries; namely Germany, France, Holland, and Sweden. Why did we select these countries? One possible answer is given now. We use and complement Jan van Ours’ Table 2 taken from his discussion of our book, and presented below. First, all countries in the Table, even the U.K., decreased hours between 1950 and 2004. This decrease differs across countries but is virtually always larger than 20%. Then, part-time work is present in most countries, but never as prevalent as in the Netherlands, the so-called part-time economy. Part-time is one obvious way of sharing work. As indicated above, this Dutch case will be thoroughly examined. The next column tells us that the number of hours per week is different across European countries, except the Netherlands again, essentially because of the presence of part-time as evidenced in the previous column (this share is included in the computation accounting for the respective number of hours for full-time and part-time workers). Moving to the next column, Sweden stands out because Swedes work much less weeks than any other countries of the Table. We will exactly focus on this issue and try to understand the reasons for and the consequences of such a way of sharing work. The number of hours per year are given in the next column. Italy and the U.K. are clear leaders, Sweden and Holland clear “losers”, and France and Germany in between. In this respect, these last two countries are very similar but, in fact, experienced very different ways of sharing work as will be seen: bargaining have very different traditions in the two countries and it
shows. These two contrasting examples will also be thoroughly investigated. Strikingly, the employment rate also widely differ, almost in a similar fashion as in the previous column. A couple of exceptions though, Italy and the U.K. These countries have not shared work as analyzed in this book, i.e. by manipulating hours. But, Italy has “prevented” his youth and women from having jobs. The employment rates are then directly reflected in the number of hours per person (last column), the product of the two previous columns.

### Table 1: Some Numbers on Hours of Work in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Change in hours 1950-1975</th>
<th>Change in hours 1975-2004</th>
<th>Part-time</th>
<th>Hours/week</th>
<th>Weeks/year</th>
<th>Hours/year</th>
<th>Employment rate 2002</th>
<th>Hours/person</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-10.5</td>
<td>-16</td>
<td>13.7</td>
<td>36.2</td>
<td>40.5</td>
<td>1467</td>
<td>62.2</td>
<td>912</td>
</tr>
<tr>
<td>Germany</td>
<td>-25.2</td>
<td>-6.5</td>
<td>18.8</td>
<td>36.5</td>
<td>40.6</td>
<td>1480</td>
<td>65.3</td>
<td>966</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-21</td>
<td>-12.2</td>
<td>33.9</td>
<td>31.8</td>
<td>38.4</td>
<td>1223</td>
<td>74.5</td>
<td>911</td>
</tr>
<tr>
<td>Sweden</td>
<td>-17</td>
<td>-0.9</td>
<td>13.8</td>
<td>38.1</td>
<td>35.4</td>
<td>1349</td>
<td>74.9</td>
<td>1010</td>
</tr>
<tr>
<td>Italy</td>
<td>-7.4</td>
<td>-7.4</td>
<td>11.9</td>
<td>37.4</td>
<td>41</td>
<td>1533</td>
<td>55.6</td>
<td>852</td>
</tr>
<tr>
<td>U.K.</td>
<td>-11</td>
<td>-9</td>
<td>23</td>
<td>38.2</td>
<td>40.5</td>
<td>1546</td>
<td>72.7</td>
<td>1124</td>
</tr>
</tbody>
</table>

Notes: For all numbers, see Jan Van Ours, Table 2 in this book. For the other numbers, OECD and own computation from the book. Germany is West-Germany for the relevant period.

The resulting structure of the book is the following. 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

¹ IG Metall was by far the biggest union until 2001.
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 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 the theory chapter, 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 this chapter 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 work week 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 in the way it was 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 but number of weeks per year lowest in our Table 1.

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 “straight” work-sharing (i.e. going from, say, 40 to 35 hours) 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.
Reduction of working time and employment

Abstract

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 Ger-
many, 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 which was not triggered by mandatory reductions in hours but by the entry of women in the labor market in a country in which women have a relatively strong preference for combining care for their families with working outside the house. We can explain 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 form 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:

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

\[ T \text{ denotes the standard work week} \]
\[ W \text{ denotes the wage for standard hours} \]
\[ Z \text{ denotes the fixed costs} \]
\[ x \text{ denotes the overtime premium} \]

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 \( \text{and} \) 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 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 ($\eta^H_x$ and $\eta^N_x$) and legal duration of work ($\eta^H_T$ and $\eta^N_T$).

<table>
<thead>
<tr>
<th>$H^*$</th>
<th>$\eta^H_x$</th>
<th>$\eta^H_T$</th>
<th>$\eta^N_x$</th>
<th>$\eta^N_T$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.9 \times T$</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$T$</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>-0.96</td>
</tr>
<tr>
<td>$1.04 \times T$</td>
<td>-2.23</td>
<td>-2</td>
<td>2.00</td>
<td>1.86</td>
</tr>
</tbody>
</table>

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).

¹Formally, the production function takes the form $AK^{0.3} [H^{0.9} L]^{0.7}$ where $A$ is a positive constant.
Table 1 shows that variations in standard hours have very different effects on employment, since elasticity $\eta_N^{NT}$ 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 $\eta_H^H$ amounts to $-2$ ) and a 18.6 percent decrease in employment.

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. Table 2 displays the results of these three cases.

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2 For more details see the appendix on the labor demand elasticities.
<table>
<thead>
<tr>
<th>Changes in: (percentage)</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>+13</td>
<td>-17</td>
<td>-5</td>
</tr>
<tr>
<td>Production</td>
<td>+6</td>
<td>-22</td>
<td>-16</td>
</tr>
<tr>
<td>Profits</td>
<td>+12</td>
<td>-33</td>
<td>-8</td>
</tr>
</tbody>
</table>

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.

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 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 percent 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 huge. 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

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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.
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.

<table>
<thead>
<tr>
<th>Employers subsidies necessary to keep unchanged</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>-8</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Profits</td>
<td>-5</td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

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 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 $\Omega$ 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 Shetkat (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).

Part-time work

Part-time jobs are usually defined as jobs with work durations that are less than the normal working week of comparable jobs. The share of part-time work is determined by labor supply and labor demand behaviors. For instance, 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 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. More generally, the participation of women in the labor market is associated with more part-time work because there are more incentives to work part-time in households with two wage earners than in households with only one wage earner. From this point of view, the spread of part time work in many OECD countries over the last decades is the consequence of changes in labor supply to a large extent. But changes in labor demand can also play a role. The analysis of labor demand shows that there are some reasons for firms to use part-time work. First, there are some
activities where there is a need to work too few hours every day to offer full time jobs. Such activities are frequent in service industries such as commercial cleaning and social and personal services for instance. The strong development of these activities also contributes to the spread of part-time jobs. Second, part-time jobs also make it easier for firms to match workers to changing workloads when there are changes in demand. Third, part-time jobs allow employers to have cheap and flexible workers: in many countries part time workers have lower wages and less employment protection.

For this last reason, part-time jobs are sometime considered as low quality jobs whose quantity should be limited in order to facilitate the creation of full-time jobs. Unfortunately, reducing the number of part-time jobs does not necessarily increase the number of full-time jobs. It is the case only if full-time jobs and part-time jobs are very strongly substitutable and if people who work part-time would also accept to work full-time. Reducing the number of part-time jobs can even reduce the number of full-time jobs if the productivity of full-time workers is reduced when there are less part-time workers. Therefore, limitations on the use of part-time jobs have a very uncertain impact on the number of full-time jobs and are likely to reduce the total number of hours in the economy. All in all, economic analysis indicates that it is generally not efficient to support more full-time jobs than part-time jobs as far as the choice of working hours is the consequence of interactions of labor supply and labor demand behaviors on well-functioning labor markets. For instance, in the Netherlands, the impressive spread of part time has been 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, only the individuals for whom \( v(R, H_0) < v(\Omega, H_0 - H) \) accept jobs with earnings \( \Omega \) 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 contraints 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 Ravaillon, 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 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 an objective that increases with employment and wages. The production of the firm depends on the number of workers hired and the hours of work. The outcome of the bargaining determines, together with the choice of employment by the firm, wages, working hours, and the number of jobs.

*The choice of hours*

Let us first consider the case where the upper limit on working hours is not binding. It can be shown that the negotiated number $H_b$ of working hours depends on the bargaining power of the trade-union ($\gamma$), on the preference for income versus leisure ($\mu$), on the weight of employment in union’s objective ($\beta$) and on technological parameters such as the elasticity of the revenue function of the firm ($\alpha$) and the elasticity of the efficiency of hours ($\varepsilon$). The signs of the variations of the negotiated number of working hours can be summarized by the following expression (see equation (??) in the appendix):

$$H_b(\gamma, \mu, \beta, \alpha, \varepsilon)$$

where the symbols $+$ and $-$ indicates the sign of the impact of an increase in the corresponding parameter on the negotiated number of hours and where one denotes:

- $\gamma$ : bargaining power of the trade union
- $\mu$ : the preference for income over leisure
- $\beta$ : weight of employment in union’s objective
- $\alpha$ : elasticity of the revenue function function of the firm
- $\varepsilon$ : elasticity of the efficiency of hours

When the elasticity ($\varepsilon$) of the efficiency of labor services with respect to working hours is high, working hours are also high because reductions in working hours imply large production losses. In other words, it is more interesting to work longer hours when the marginal efficiency of hours is high. If the workers attach more importance to income with respect to leisure, they will work longer hours. Thus, $H_b$ is an increasing function of the parameter $\mu$ as in the competitive model.

*Bargaining power, market power and working hours*
The model shows that increases in union’s bargaining power ($\gamma$) lead to lower working hours. Indeed, a stronger union can bargain higher utility levels for his employees. Thus, as far as leisure is 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 ($\alpha$) 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 ($\beta$) 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 worked\(^5\). 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 $H_{\text{max}}$.

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 $H_{\text{max}}$. Below this value, the elasticity of the

\(^5\)It is shown in the appendix that this elasticity amounts to $\bar{H}(1-\mu)/\mu(H_0-\bar{H})$.\]
weekly wage with respect to hours becomes too small to allow reductions in working hours to create 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 $H_{\text{max}}$ is equal to the number of hours negotiated $H_b$ when the union disposes of all the bargaining power. It is also shown that $H_{\text{max}}$ 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, $H_{\text{max}}$, increases with the elasticity $\varepsilon$ 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 flexibility, 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*
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 that 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.
5 References


1 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 $\sigma$ the elasticity of substitution between capital and labor and by $R$ the user cost of capital. Log-differentiation of the first-order condition

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

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 $F_{11}Kd + eNF_2 = F$, $F_{11}Kd = -F_{12}eN$ 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

$$
\sigma = \frac{F_1F_2}{F_{12}F} = \frac{-d(H)KF_1F_2}{e(H)NF_{22}}
$$

(1)

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

$$
\frac{\delta H}{H} \left( \eta_H + \frac{F_{21}Kd(H)}{F_2} \eta_H + \frac{F_{22}Ne(H)}{F_2} \eta_H \right) + \frac{\delta N}{N} \left( \frac{e(H)NF_{22}}{F_2} \right) = \frac{\delta \Omega}{\Omega}
$$
where \( \eta_H \) denote the elasticity of function \( x = e, d \) with respect to hours.

Using equation (1) 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:

\[
\eta^N_H = \eta^d_H + \left( \frac{\sigma - \alpha}{\alpha} \right) \eta^e_H - \frac{\sigma}{\alpha} \eta^\Omega_H
\]

(2)

where \( \eta^\Omega_H \) stands for the elasticity of the weekly wage with respect to hours. Equation (2) shows that reductions in working time decrease employment when there is full wage compensation (\( \eta^\Omega_H = 0 \)) if \( \eta^d_H \geq 0, \eta^e_H \geq 0 \) and the elasticity of substitution between capital and labor services \( \sigma \) is larger than the share of capital in total costs \( \alpha \). These conditions, which are very weak, are generally satisfied.

The results given in tables ?? and ?? assume that \( \alpha = 0.3 \) and \( \sigma = 0.5 \).

2 The collective bargaining model

2.1 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 \( \gamma \in [0,1] \). 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 \( \Omega, H_0 \) 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 \( \mu \) 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 \( \varepsilon \), 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:

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

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:

\[
\Pi = \frac{1}{\alpha} [e(H)L]^\alpha - \Omega L \quad (3)
\]

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 \( \Omega \) and \( H \) taken as given. Setting the derivative of (3) to zero with respect to \( L \), we get:

\[
L(\Omega, H) = [e(H)]^{1/\alpha} \Omega^{1-\gamma} \quad (4)
\]

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

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

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:

\[
\max_{(\Omega, H)} \left[ \frac{L(\Omega, H)}{N} \right]^{\beta \gamma} [v(\Omega, H_0 - H) - v(\overline{w}, H_0)]^{\gamma(1-\beta)} [\Pi(\Omega, H)]^{1-\gamma}
\]

subject to:

\[
L(\Omega, H) \leq N \quad \text{and} \quad H \leq \overline{H}
\]

2.2 The optimal number of hours worked

Interior solutions

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

\[
\frac{(1 - \beta)\gamma v_1(\Omega, H_0 - H)}{v(\Omega, H_0 - H) - v(\overline{w}, H_0)} = \frac{\alpha(1 - \gamma) + \gamma}{(1 - \alpha)\Omega} \quad (5)
\]
\[
\frac{(1 - \beta)\gamma v_2(\Omega, H_0 - H)}{v(\Omega, H_0 - H) - v(\bar{\pi}, H_0)} = \frac{\alpha \varepsilon (\beta \gamma + 1 - \gamma)}{(1 - \alpha) \bar{H}} \tag{6}
\]

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

\[
\frac{v_1(\Omega, H_0 - H)}{v_2(\Omega, H_0 - H)} = H \frac{\alpha (1 - \gamma) + \beta \gamma}{\Omega \alpha \varepsilon (\beta \gamma + 1 - \gamma)} \tag{7}
\]

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 \( \varepsilon \) of individual productivity with respect to hours. The general study of the system formed by equations (5) and (6) 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 (7) then immediately gives us the number of hours worked:

\[
H_b = \frac{\varepsilon \mu \alpha [1 - \gamma(1 - \beta)]}{(1 - \mu) [\gamma \beta + \alpha (1 - \gamma)] + \varepsilon \mu \alpha [1 - \gamma(1 - \beta)]} H_0 \tag{8}
\]

The parameter \( \mu \) is interpreted as a measure of the importance of income with respect to leisure for each worker. Equation (8) shows that the optimal number of hours worked is an increasing function of this parameter, and of elasticity \( \varepsilon \). 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 (8). The negotiated wage is then given by equation (5) with \( H = \bar{H} \). Assuming, as above, that preferences are of the Cobb-Douglas type, this equation implicitly defines the negotiated wage as follows:

\[
\Omega^\mu (H_0 - H)^{1-\mu} = \frac{\alpha (1 - \gamma) + \gamma \beta}{\alpha (1 - \gamma) + \gamma \beta - \gamma \mu (1 - \beta)(1 - \alpha)} v(\bar{\pi}, H_0) \tag{9}
\]

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 \( \eta_H^\Omega \) 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 (4) defining labor demand gives the employment level which is thus equal to \( L(\Omega, \bar{H}) \). As the negotiated global wage \( \Omega \) depends also on \( \bar{H} \) see equation (9) –, 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 \( H_{\text{max}} \) defined by:

\[
H_{\text{max}} = \frac{\varepsilon \mu \alpha}{(1 - \mu) + \varepsilon \mu \alpha} H_0 \tag{10}
\]
Comparison of equations (8) and (10) indicates that $H_{\text{max}}$ 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 $\gamma$ of the workers, one always has $H_b > H_{\text{max}}$ for $0 < \gamma < 1$. Finally, noticing that $H_{\text{max}}$ does not depend on $H$, one obtains Figure ?? that represents the employment level as a function of $H$.

### 3 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 $R_{\text{u}}$. Thus, only the individuals for whom $y > (WH)^\mu (H_0 - H)^{1-\mu}$ 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:

$$W_C = y, \quad H_C = \mu H_0, \quad L_C = \frac{y}{R_u} H_C \left(\frac{H_0 - H_C}{H_0}\right)^{\frac{1-\mu}{\mu}}. \quad (11)$$

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
Figure 1: 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.

parameters the monopsonist problem reads

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

subject to:

\[
H \leq \bar{H}
\]  

(12)

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

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

One sees that \( W_M < W_C, \ H_M > H_C \) and \( L_M < L_C \).

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

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

(13)

The results are displayed on figure 1. 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 1 we have drawn the function \( L(\bar{H}) = \frac{y}{2R_u} \bar{H} \left( \frac{H_0 - \bar{H}}{H_0} \right)^{1-\mu} \) 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 1. 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 $H = H_C$. In that case, (11) and (13) 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. 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. 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). Since the incidence of unionization is positively related with firm size, the coverage rate of employees is much higher. 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.

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

\[ \text{2 Well-known examples for agreements at the firm-level are Lufthansa, Siemens, Volkswagen, Deutsche Telekom or the oil companies.} \]

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

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

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

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

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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.
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.\textsuperscript{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 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 Germany can

\textsuperscript{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.
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 second 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 one 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 status. 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

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12 Dummies for sectoral affiliation and firm size have been dropped since both groups turned out to be insignificant.
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.” 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). 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 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.
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. Nevertheless, all empirical studies have found 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.\(^\text{16}\) 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 (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).\(^\text{17}\) 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.\(^\text{18}\)

Due to wage responses summarized above, it is unlikely that the reduction in standard hours had a beneficial effect on employment in Germany. Indeed, direct estimates of the impact of lowering standard hours on employment are mainly insignificant or very small (see Appendix Table A.1b for a summary). 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 reflects

\(^{15}\) 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.

\(^{16}\) Appendix Table A.1a summarizes the econometric evidence on the impact of standard hours on hourly wages for Germany.

\(^{17}\) 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.

\(^{18}\) 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.
that both series were moving simultaneously.

It should be noted that the first four studies listed in Appendix A.1b 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.19 The exception is the large pro-work-sharing effect in small plants (smaller than 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 time 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

19 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.
the possibility for a certain percentage of employees to work permanently longer than the collectively agreed working time\textsuperscript{20}

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.

a further working time reduction without wage compensation for a limited period of time. 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 (\textit{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 hours\textsuperscript{21} as well as according to the time interval in which these hours must be compensated.

\textsuperscript{20} 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.

\textsuperscript{21} 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.
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).\textsuperscript{22}

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 have a working time account.\textsuperscript{23} 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

\textsuperscript{22} This problem can obviously be reduced by a limit on the maximum working time credit.

\textsuperscript{23} 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.
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 3). 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 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.24

Table 3 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 productivity (value added per hour) 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 3), changes in standard hours are not identified by direct responses

24 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.
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 no 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, 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 (see Appendix Tables A.2a and A.2b for the full 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.

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 2002\(^{26}\), the export share within

\(^{25}\)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.
total sales, the profit situation in 2002, existence of a works council in 2002, a dummy for investment in ICT in 2002, dummies for plant age, bargaining dummies, firm size and sectoral dummies.\textsuperscript{27}

Table 4 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, an increase in standard hours by 1 hour reduces productivity per hours worked by 3.4 percent. Surprisingly, reducing standard hours by 1 hour is also related with a decrease in productivity per hour by 3.1 percent. We suspect that this is due to firms in a downturn not fully adjusting labor input to the fall in output.
4. The respective coefficients of the productivity regressions for Eastern Germany are also negative, but of a smaller magnitude and insignificant. 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).\textsuperscript{28}
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.\textsuperscript{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.

\textsuperscript{27} These variables are equivalent to those included in the multinomial logit regression.
\textsuperscript{28} Firstly, 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 guessimate”. This is reassured by the fact that two third of the observations (on material costs) are multiples of 5 percent. Secondly, the hours variable consists only of normal working time, while productivity per actual hours worked (including overtime) would be the more appropriate measure. In particular, plants which have increased standard hours may have cut overtime work, in which case the estimated (negative) effect on productivity is biased downwards.
\textsuperscript{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.
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 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 4). 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. 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. 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.

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

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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.

Information on weekly standard working time is available for all years except 1994, 2000 and 2003. 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.

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

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


### Table 2: Standard Hours and Bargaining Agreements:

**Dependent Variable: Changes in Standard Hours**

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.
### OLS Regression Estimates$^{a,c}$

<table>
<thead>
<tr>
<th>Bargaining agreements in $t-1$ and $t$</th>
<th>Unweighted</th>
<th>Weighted$^d$</th>
<th>No of obs:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Western</td>
<td>Eastern</td>
<td>Western</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None$_{t-1}$ * None$_t$</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.028</td>
<td>-0.004</td>
<td>-0.043</td>
</tr>
<tr>
<td></td>
<td>[-0.49]</td>
<td>[-0.06]</td>
<td>[0.38]</td>
</tr>
<tr>
<td>None$_{t-1}$ * Industry Level$_t$</td>
<td>0.010</td>
<td>-0.022</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>[0.08]</td>
<td>[-0.23]</td>
<td>[0.34]</td>
</tr>
<tr>
<td>Industry Level$_{t-1}$ * None$_t$</td>
<td>0.311</td>
<td>0.213</td>
<td>0.499</td>
</tr>
<tr>
<td></td>
<td>[5.91]</td>
<td>[3.77]</td>
<td>[4.52]</td>
</tr>
<tr>
<td>Industry Level$_{t-1}$ * Industry Level$_t$</td>
<td>-0.039</td>
<td>-0.005</td>
<td>-0.045</td>
</tr>
<tr>
<td></td>
<td>[-1.48]</td>
<td>[-0.16]</td>
<td>[-1.41]</td>
</tr>
<tr>
<td>Industry Level$_{t-1}$ * Firm Level$_t$</td>
<td>0.070</td>
<td>-0.042</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>[0.71]</td>
<td>[-0.40]</td>
<td>[0.51]</td>
</tr>
<tr>
<td>Firm Level$_{t-1}$ * None$_t$</td>
<td>0.203</td>
<td>0.016</td>
<td>0.109</td>
</tr>
<tr>
<td></td>
<td>[2.27]</td>
<td>[0.25]</td>
<td>[0.98]</td>
</tr>
<tr>
<td>Firm Level$_{t-1}$ * Industry Level$_t$</td>
<td>-0.029</td>
<td>0.009</td>
<td>-0.046</td>
</tr>
<tr>
<td></td>
<td>[-0.34]</td>
<td>[0.10]</td>
<td>[-0.56]</td>
</tr>
<tr>
<td>Firm Level$_{t-1}$ * Firm Level$_t$</td>
<td>-0.007</td>
<td>0.018</td>
<td>-0.041</td>
</tr>
<tr>
<td></td>
<td>[-0.11]</td>
<td>[0.30]</td>
<td>[-0.46]</td>
</tr>
<tr>
<td>Works Council (Dummy: 1 = yes)</td>
<td>-0.032</td>
<td>-0.040</td>
<td>-0.038</td>
</tr>
<tr>
<td></td>
<td>[-1.35]</td>
<td>[-1.25]</td>
<td>[-1.80]</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.007</td>
<td>0.004</td>
<td>0.011</td>
</tr>
</tbody>
</table>

| 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: Adjustment in monthly wages after changes in standard hours**

**Number of observations and employment growth**

<table>
<thead>
<tr>
<th>Change in standard hours</th>
<th>No information</th>
<th>Monthly Wage Adjustment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fully</td>
<td>Partly</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Extension</td>
<td>8</td>
<td>83</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>(-0.024)</td>
<td>(0.010)</td>
<td>(-0.026)</td>
</tr>
<tr>
<td>Reduction</td>
<td>3</td>
<td>94</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>(-0.019)</td>
<td>(-0.001)</td>
<td>(-0.015)</td>
</tr>
</tbody>
</table>

\(^a\) IAB Establishment-Panel, 2004.
Table 4: OLS-estimations of growth in employment and value added per hour.

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

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Rate of employment change between 2004 and 2002 d</th>
<th>Growth in value added per (standard) hour between 2002 and 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total e</td>
<td>-0.034</td>
<td>-0.034</td>
</tr>
<tr>
<td>Unskilled</td>
<td>-0.003</td>
<td>[1.95]</td>
</tr>
<tr>
<td>White Collar</td>
<td>0.001</td>
<td>[0.64]</td>
</tr>
<tr>
<td>Skilled Blue Collar</td>
<td>-0.012</td>
<td>[2.12]</td>
</tr>
<tr>
<td>Western Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in standard hours (obs = 394/278)</td>
<td>-0.010</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>[1.95]</td>
<td>[2.04]</td>
</tr>
<tr>
<td>Decrease in standard hours (obs = 295/203)</td>
<td>-0.002</td>
<td>-0.008</td>
</tr>
<tr>
<td></td>
<td>[0.23]</td>
<td>[1.18]</td>
</tr>
<tr>
<td>Eastern Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in standard hours (obs = 153/107)</td>
<td>-0.017</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>[1.88]</td>
<td>[0.59]</td>
</tr>
<tr>
<td>Decrease in standard hours (obs = 162/113)</td>
<td>0.003</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>[0.44]</td>
<td>[1.86]</td>
</tr>
</tbody>
</table>

a Source: IAB-Establishment Panel. Excluded are plants which reported a standard work week of more than 48 or less than 28 hours, plants which reported a change of more than 10 hours between 2004 and 2002 as well as plants with a growth in employment (value added per employee) of more than 100%.
2,221 (1,977) observations for Western (Eastern) Germany in the employment regressions. 1,619 (1,508) observations for Western (Eastern) Germany in the value added regressions. Lower sample size in the value added regressions due to missing values. Absolute t-values in brackets. Further independent variables equivalent to those reported in the Appendix Tables A.2a and A.2b.

\[d\] 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, by Bargaining Agreement

![Graph showing standard working time by bargaining agreement for Western and Eastern Germany from 1996 to 2004.](image)

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, by Bargaining Agreement; Normalized

![Graph showing between-plant dispersion in standard working time by bargaining agreement for Western and Eastern Germany from 1996 to 2004.](image)

Source: IAB-Establishment Panel.
Weighted statistics (weights are constructed by multiplying the survey weights by employment).
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.\footnote{The minimum wage legislation in France specifies an hourly wage.} 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).
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 agreement\(^2\) was signed setting a 35 hours workweek or a 1600 hours work-year\(^3\) (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. 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.

At the same time, the Aubry II law tried to favor wage increase moderation through negotiations with the
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 Desplat, 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 multinominal 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 Desplat 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. 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 group\(^8\) 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

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\(^8\) 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 \( \varepsilon \) 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 \( \varepsilon \) 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 \( 1-\varepsilon \) 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 \( \Delta \log L = \Delta \log Q_0 - (1-\varepsilon) \Delta \log h - (1-\alpha) \Delta \log K / \Delta \log w / \Delta \log c \) 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 firms 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 Desplat (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

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

Source: BRN, DADS, Worksharing agreement file
### Table 2: Agreements and Economic Structure

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

Source: BRN, DADS, Agreement file. Multinomial logit estimated by maximum likelihood. The regression also includes sectoral indicators.
### Table 3a: Productivity Decomposition (1997-2000)

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Total</th>
<th>Within</th>
<th>Between</th>
<th>Exit</th>
<th>Number</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robien</td>
<td>1.59</td>
<td>1.79</td>
<td>-0.21</td>
<td>-0.01</td>
<td>16</td>
<td>0.06</td>
</tr>
<tr>
<td>Aubryl</td>
<td>-1.82</td>
<td>-0.14</td>
<td>-1.71</td>
<td>-0.02</td>
<td>88</td>
<td>0.29</td>
</tr>
<tr>
<td>Aubryll Précurseurs</td>
<td>0.62</td>
<td>1.12</td>
<td>-0.53</td>
<td>-0.02</td>
<td>18</td>
<td>0.04</td>
</tr>
<tr>
<td>Aubryll</td>
<td>0.61</td>
<td>0.50</td>
<td>0.09</td>
<td>-0.02</td>
<td>58</td>
<td>0.06</td>
</tr>
<tr>
<td>Aubryll less than 50 employees</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td>Agreement but not recorded</td>
<td>0.83</td>
<td>0.75</td>
<td>0.06</td>
<td>-0.02</td>
<td>79</td>
<td>0.07</td>
</tr>
<tr>
<td>Non eligible</td>
<td>0.28</td>
<td>0.11</td>
<td>0.19</td>
<td>0.01</td>
<td>21</td>
<td>0.08</td>
</tr>
<tr>
<td>Aubry I &quot;defensif&quot;</td>
<td>-0.04</td>
<td>-0.06</td>
<td>0.01</td>
<td>0.00</td>
<td>8</td>
<td>0.01</td>
</tr>
<tr>
<td>No agreement</td>
<td>2.14</td>
<td>1.25</td>
<td>0.09</td>
<td>-0.79</td>
<td>4,617</td>
<td>9.14</td>
</tr>
<tr>
<td>Total</td>
<td>4.21</td>
<td>5.34</td>
<td>-2.00</td>
<td>-0.88</td>
<td>4,906</td>
<td>9.74</td>
</tr>
</tbody>
</table>

### Table 3b: Productivity Decomposition (1997-2003)

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Total</th>
<th>Within</th>
<th>Between</th>
<th>Exit</th>
<th>Number</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robien</td>
<td>1.49</td>
<td>1.81</td>
<td>-0.15</td>
<td>0.17</td>
<td>225</td>
<td>1.01</td>
</tr>
<tr>
<td>Aubryl</td>
<td>-1.05</td>
<td>0.23</td>
<td>-1.73</td>
<td>-0.46</td>
<td>1,386</td>
<td>1.95</td>
</tr>
<tr>
<td>Aubryll Précurseurs</td>
<td>1.56</td>
<td>1.47</td>
<td>0.13</td>
<td>0.05</td>
<td>329</td>
<td>1.52</td>
</tr>
<tr>
<td>Aubryll</td>
<td>0.00</td>
<td>-0.06</td>
<td>0.07</td>
<td>0.01</td>
<td>1,064</td>
<td>1.88</td>
</tr>
<tr>
<td>Aubryll less than 50 employees</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>26</td>
<td>0.01</td>
</tr>
<tr>
<td>Agreement but not recorded</td>
<td>0.73</td>
<td>0.62</td>
<td>0.03</td>
<td>-0.08</td>
<td>776</td>
<td>0.65</td>
</tr>
<tr>
<td>Non eligible</td>
<td>0.06</td>
<td>0.04</td>
<td>0.12</td>
<td>0.09</td>
<td>228</td>
<td>0.46</td>
</tr>
<tr>
<td>Aubry I &quot;defensif&quot;</td>
<td>0.02</td>
<td>-0.13</td>
<td>0.05</td>
<td>-0.10</td>
<td>141</td>
<td>0.25</td>
</tr>
<tr>
<td>No agreement</td>
<td>2.09</td>
<td>0.90</td>
<td>0.00</td>
<td>-1.18</td>
<td>7,170</td>
<td>11.09</td>
</tr>
<tr>
<td>Total</td>
<td>4.92</td>
<td>4.89</td>
<td>-1.49</td>
<td>-1.52</td>
<td>11,345</td>
<td>18.81</td>
</tr>
</tbody>
</table>
### Table 4a: Agreements and Economic Outcomes (Employment and Labor Costs)

<table>
<thead>
<tr>
<th></th>
<th>Value added</th>
<th>Employment</th>
<th>Labor Cost (per emp.)</th>
<th>Average Wage</th>
<th>Payroll Taxes</th>
<th>Labor Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AubryI</strong></td>
<td>0.108 (0.006)</td>
<td>0.171 (0.005)</td>
<td>-0.072 (0.003)</td>
<td>-0.047 (0.003)</td>
<td>-0.136 (0.003)</td>
<td>-0.063 (0.004)</td>
</tr>
<tr>
<td>AubryI Précurseur</td>
<td>0.082 (0.013)</td>
<td>0.113 (0.011)</td>
<td>-0.070 (0.006)</td>
<td>-0.056 (0.006)</td>
<td>-0.107 (0.007)</td>
<td>-0.030 (0.008)</td>
</tr>
<tr>
<td>AubryII</td>
<td>0.056 (0.007)</td>
<td>0.104 (0.006)</td>
<td>-0.047 (0.003)</td>
<td>-0.031 (0.003)</td>
<td>-0.088 (0.004)</td>
<td>-0.048 (0.004)</td>
</tr>
<tr>
<td>Other Agreement</td>
<td>0.017 (0.008)</td>
<td>0.026 (0.007)</td>
<td>-0.014 (0.004)</td>
<td>-0.014 (0.004)</td>
<td>-0.016 (0.005)</td>
<td>-0.009 (0.006)</td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.08</td>
<td>0.10</td>
<td>0.25</td>
<td>0.24</td>
<td>0.21</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Period: 1997-2003

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)

<table>
<thead>
<tr>
<th></th>
<th>Capital Return on Capital</th>
<th>Capital Productivity</th>
<th>Total Factor Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AubryI</strong></td>
<td>0.087 (0.007)</td>
<td>0.005 (0.004)</td>
<td>-0.021 (0.007)</td>
</tr>
<tr>
<td>AubryI Précurseur</td>
<td>0.023 (0.013)</td>
<td>0.046 (0.009)</td>
<td>0.059 (0.014)</td>
</tr>
<tr>
<td>AubryII</td>
<td>0.064 (0.007)</td>
<td>-0.006 (0.005)</td>
<td>-0.008 (0.007)</td>
</tr>
<tr>
<td>Other Agreement</td>
<td>0.007 (0.009)</td>
<td>-0.008 (0.006)</td>
<td>0.010 (0.009)</td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.11</td>
<td>0.24</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Period: 1997-2003

Regressions include all variables of Table 2 as control variables. 1997-2003: 43,779 observations; 1997-2000: 47,866 observations
Table 5: Survival Probability

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aubryl</td>
<td>0.021</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Aubryll Précurseur</td>
<td>0.059</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Aubryll</td>
<td>-0.008</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Other Agreement</td>
<td>0.010</td>
<td>(0.009)</td>
</tr>
</tbody>
</table>

Estimated by maximum likelihood. 56,183 observations. Includes same controls as Table 2.
### Table 6: Workweek Reduction and Work Schedule

<table>
<thead>
<tr>
<th>Workweek Agreement (in March 2001)</th>
<th>Schedule</th>
<th>Managers, Engineers</th>
<th>Technicians</th>
<th>Clerical Workers</th>
<th>Blue-Collar Workers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Regular (week)</td>
<td>66</td>
<td>77</td>
<td>69</td>
<td>72</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>32</td>
<td>22</td>
<td>24</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Yes</td>
<td>Regular (week)</td>
<td>71</td>
<td>72</td>
<td>69</td>
<td>64</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>26</td>
<td>25</td>
<td>21</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>Regular (week)</td>
<td>68</td>
<td>74</td>
<td>69</td>
<td>67</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>29</td>
<td>24</td>
<td>22</td>
<td>23</td>
<td>18</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Workweek Agreement (in March 2001)</th>
<th>Schedule</th>
<th>Less than 50 Workers</th>
<th>50 Workers or More</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Regular (week)</td>
<td>83</td>
<td>85</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>12</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Yes</td>
<td>Regular (week)</td>
<td>80</td>
<td>68</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>8</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>13</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>Regular (week)</td>
<td>82</td>
<td>81</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>5</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Workweek Agreement (in March 2001)</th>
<th>Schedule</th>
<th>Less than 50 Workers</th>
<th>50 Workers or More</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Regular (week)</td>
<td>74</td>
<td>73</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>21</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>Yes</td>
<td>Regular (week)</td>
<td>73</td>
<td>67</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>7</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>19</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>Regular (week)</td>
<td>74</td>
<td>71</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Cyclical</td>
<td>6</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>20</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Work Schedules</th>
<th>Total</th>
<th>Managers</th>
<th>Non Managers</th>
<th>Manuf.</th>
<th>Services</th>
<th>Less than 50</th>
<th>50 workers or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evening Work (20h to 0h)</td>
<td>3.9***</td>
<td>8.6**</td>
<td>2.8**</td>
<td>6.1***</td>
<td>3.0**</td>
<td>0.9**</td>
<td>2.3***</td>
</tr>
<tr>
<td>Night Work (0h to 5h)</td>
<td>2.8***</td>
<td>5.7*</td>
<td>2.4***</td>
<td>4.3**</td>
<td>2.0**</td>
<td>-2.7*</td>
<td>4.9**</td>
</tr>
<tr>
<td>Saturday Work</td>
<td>1.9</td>
<td>5.5</td>
<td>1.2</td>
<td>0.8</td>
<td>2.5</td>
<td>-2.7</td>
<td>3.2**</td>
</tr>
<tr>
<td>Sunday Work</td>
<td>2.4**</td>
<td>5.4*</td>
<td>1.7</td>
<td>1.7</td>
<td>2.4**</td>
<td>1.6</td>
<td>3.2**</td>
</tr>
<tr>
<td>Annualization</td>
<td>9.2***</td>
<td>3.3</td>
<td>9.9***</td>
<td>9.0***</td>
<td>9.5***</td>
<td>9.8***</td>
<td>9.8***</td>
</tr>
<tr>
<td>Part-time</td>
<td>-2.3***</td>
<td>-1.6</td>
<td>-2.0**</td>
<td>-2.3</td>
<td>-2.4**</td>
<td>-2.9**</td>
<td>0</td>
</tr>
<tr>
<td>Control of hours</td>
<td>2.1*</td>
<td>-1.3</td>
<td>3.1**</td>
<td>2.5</td>
<td>1.8</td>
<td>6.2***</td>
<td>2.5</td>
</tr>
</tbody>
</table>

| 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 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%.
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 if the goal is to create employment for the long term unemployed. However, reducing working hours through career interruptions may still be an efficient way of creating time off for other purposes such as child care or education.
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.

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\(^1\) 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).

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 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, lifetime 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.”

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. 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 experience. 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

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4 Quoted from the Green Party program ([www.mp.se](http://www.mp.se)). Interestingly, the term “another” refers to a preceding discussion regarding a proposal to reduce working time to 30 hours per week.


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.\footnote{Ministry of Labor (2004).}

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.
Table 1: Who are the participants?

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

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

Table 2: What do they do?

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

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.\textsuperscript{8} We discuss the credibility of this assumption below.

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.\textsuperscript{9} Differences in observed characteristics are not a problem \textit{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 \textit{between} the two groups (initially approved and rejected) in the same manner as they are \textit{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.

\textsuperscript{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.

\textsuperscript{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.
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).

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.

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

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. 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

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

<table>
<thead>
<tr>
<th>Days of unemployment</th>
<th>Replacement workers</th>
<th>Comparison workers</th>
<th>Treatment effect</th>
<th>Effect in percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-24 months after start</td>
<td>54.3</td>
<td>77.2</td>
<td>-22.9 (2.06)**</td>
<td>-30</td>
</tr>
<tr>
<td>Days of unemployment or temporary job 13-24 months after start</td>
<td>114.8</td>
<td>154.9</td>
<td>-40.1 (2.64)**</td>
<td>-26</td>
</tr>
</tbody>
</table>

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 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.

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\(^{11}\) 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.

\(^{12}\) 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.
Table 5: Self assessed health related effects of the career break scheme.

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

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 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 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 not be viewed as a policy tool for fighting unemployment but career interruptions may have other beneficial effects by creating time off for other purposes such as child care or education which may require longer breaks rather than shorter work weeks.
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 hours\(^1\) 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 off s due to shorter working hours.
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 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 layoffs. 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 and 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 2](image-url)

**Figure 3**

![Figure 3](image-url)

\(^3\) 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.\textsuperscript{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

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

Striking in this table is the difference in preference for 4 or more children in the Netherlands, compared to W-Germany, France and Sweden.\textsuperscript{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.

---

\textsuperscript{4} Data obtained from [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org), accessed on March 31st, 2006.

\textsuperscript{5} Striking also is the very high fraction wanting 3 children in France.
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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasn’t working</td>
<td>26%</td>
<td>25%</td>
<td>29%</td>
</tr>
<tr>
<td>Working same number of hours +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>informal care</td>
<td>6%</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>formal care</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Working fewer hours +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>informal care</td>
<td>5%</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>formal care</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Stopped working</td>
<td>61%</td>
<td>55%</td>
<td>46%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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

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

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

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

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.
Conclusion

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 (opening chapter), 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 “straight” work-sharing (i.e. decreasing the workweek from, say, 40 to 35 hours) 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, in Holland, 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 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… 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.
Comments

by

Giuseppe Nicoletti

Introduction

Economists have discussed with unions and politicians the effects of a shorter workweek on employment for a long time. For instance, as statutory working hours declined and further reductions (to 30 hours!) were envisaged by the NIRA during the US Great Depression, a member of the Cowles Commission (Roos, 1935) pointed out many elements that are still broadly consensual among economic scholars:

- Decreasing hours worked without increasing hourly wages is close to impossible, mainly due to resistance of workers to cuts in their monthly wages;
- Hence, in itself, decreasing hours worked can hardly stimulate employment, because it will result in higher labour costs for firms, unless the increase in productivity deriving from less worker fatigue is unrealistically high.
- Decreasing hours worked in a coercive and across the board way (as would result from stringent federal or national laws) is a flawed and unworkable policy, notably because it fails to recognise the specific features of occupations and industries.

Clearly, these elements imply that the employment effects of working hours reductions depend closely on the precise measures (and flanking policies) implemented to achieve this aim as well as on the structural characteristics of the economy, including bargaining arrangements and other product and labour market features. Perhaps for this reason, there is no eye-catching cross-country evidence of a link between hours worked and employment rates at the macroeconomic level (Figure 1).

[Insert Figure 1]

Many of the elements listed above are also echoed in this interesting and compelling report by Francis Kramarz and his coauthors. Their analysis is an important step forward in the evaluation of
the employment effects of work-sharing policies for at least three reasons. First, it brings together very effectively scattered theory and micro evidence on this issue. Second, it provides some new firm-level and survey-based empirical work for a number of individual European countries. Third, it looks more generally at a number of work-sharing arrangements. This includes different ways in which working hours reductions are obtained in different countries, such as shorter statutory or negotiated weekly hours, part-time opportunities, and alternation (or special leave) schemes. Each time they devote due attention to the details of policies and to the market environment in which they were implemented. In the following remarks, I will first highlight what are in my view some of the merits of the report and then turn to some critical comments and suggestions for improvement.

Some merits of the report

The theory chapter

The report provides a useful overview of the economic theory of shorter working hours. Using a neat and accessible modelling framework, supported as needed by simple simulations and graphical analyses, it highlights the main mechanisms at work and the ways in which policies aimed at reducing working hours can affect employment, including through interactions with bargaining systems and market structure. The resulting analysis warns against simplistic views concerning the link between work-sharing policies and employment, pointing out that in the presence of market imperfections these effects are largely undetermined on theoretical grounds and need to be checked empirically. At the same time, it shows convincingly that employment gains can be expected only under a range of special (and sometimes undesirable on other grounds) circumstances. For instance, ceteris paribus, employment neutrality or limited gains could be expected when there are no offsetting increases in hourly labour costs. However, as shown in the empirical part, virtually all episodes of working hours reductions have been met in practice by either full or partial hourly wage compensation. Clearly, employment gains are very unlikely in this context. The resulting increase in labour costs could be offset only by productivity gains from less fatigue, increased work flexibility and/or substantial government subsidies to firms. However, the authors show that such productivity gains would need to be unrealistically high to merely ensure employment neutrality. Moreover, while measures that increase work flexibility, make working conditions less stringent or subsidize labour have often been associated with work-sharing policies, productivity and
employment gains that derive from them clearly cannot be ascribed to shorter hours. Other special factors that could favour employment gains are a high preference for leisure, family interactions and, possibly, externalities. However, as the authors point out, not much is known about their precise nature and empirical relevance. Employment gains could also derive from market arrangements providing high bargaining power to workers and/or high market power to firms. But these arrangements would tend to curb firm-level and possibly aggregate employment on their own, so they could hardly be advocated as a justification for work-sharing policies. By highlighting these channels, the report provides leads for better understanding the role played by labour market institutions and product market competition in determining the employment effects of work-sharing policies (even though as argued below these leads are not sufficiently exploited in the empirical analysis).

One of the virtues of the work by Kramarz and his co-authors is that they address these points with expositional clarity and even-handedness. Hence, one can hope that the reading of their report by economists, policy makers and social partners could help placing the discussion of work-sharing policies in a more rational setting in the future.

The case studies

To my knowledge, the report constitutes the first attempt at jointly reviewing a range of national experiences with work-sharing policies based on micro data. Previous research in this area was mostly at the individual country level, with no attempt to draw more general lessons from several country studies. Here, the reader finds a wealth of information on very diverse policies and arrangements in France, Germany, the Netherlands and Sweden. Although the depth of the country chapters is somewhat uneven (with much more detail for France than for other countries), reading about policy implementation is generally illuminating in itself and brings out differences in approaches from which lessons can potentially be drawn for future policy design. For instance, comparing policies in France and Germany highlights convincingly the pros and cons of a statalist/coercive vs corporatist/negotiated approach to work-sharing. The feeling is that, if one has to go for shorter hours, the German approach grounded in a system of industrial relations that is much more solid than across the Rhine river is preferable. This is because it has advantages in terms of flexibility, gradualism and reversibility of implementation as well as representing a lower burden on public finances due to the apparent lack of subsidies for firms. From this point of view, the
comparison with policies in Sweden and the Netherlands is also informative but less fruitful, due to their radically different focus on alternation schemes and part-time arrangements, respectively.

For France and Germany, the report presents both existing and new micro evidence on the hours-reduction/employment link. Using both a differences-in-differences approach and regression analysis (with a large set of controls), it shows that employment effects are at best very limited even in the presence of flanking policies (such as increased working time flexibility in France and Germany, and substantial subsidies in France) aimed at cushioning the negative repercussions on labour costs. While the methodology looks mostly at the short-run comparative statics effects, there is an attempt in the French case to look also at the dynamic consequences on the economy through changes in firm demography and productivity growth. Moving beyond the employment effects, the analyses for France, Sweden and the Netherlands also give some limited insights on the welfare effects of work-sharing arrangements. In the French case, changes in work schedule patterns in firms that adopted the shorter workweek cast serious doubts on the overall welfare benefits of such policies for workers and their families. Conversely, there is some evidence based on survey data that work-sharing policies improved welfare of beneficiaries of career breaks and part-time arrangements in the Swedish and Dutch cases. However, no attempt is made in the report to estimate the welfare effects for non-beneficiaries.

Some comments and suggestions

Time horizon and general equilibrium effects

The main advantage of basing the analysis of work-sharing policies on micro data is that, in principle, the influence of other concomitant factors on firm-level employment outcomes can be effectively controlled for (though not completely, as argued in the next subsection). However, there are two main reasons why such firm-level findings may not provide an adequate picture of the overall employment effects of these policies. First, as mentioned above, the empirical analyses proposed in the report focus on static comparisons, over a rather short time span, of employment outcomes in firms that adopted shorter hours relative to those of other firms. However, one would expect workweek reduction policies to cause significant adjustment costs, factor substitution effects and reallocation of resources across firms, which may unfold over a long period of time and would
require a dynamic analysis. Yet, aside from the tentative link established in the French chapter between workweek reduction policies, firm turnover and productivity, the dynamic long-run effects on employment are not explored. Second, focusing on firm-level effects implies a partial equilibrium approach that cannot fully account for the implications of policies for aggregate employment. For instance, in the French case one may expect indirect negative effects on aggregate employment from financing (through general labour income taxation) the massive subsidies that were granted to firms to mitigate the labour cost effects of hourly wage compensation for shorter hours.

Focusing on short-run comparative statics and ignoring general equilibrium effects could bias the results in favour of “Keynesian/Malthusian” outcomes. In fact, it is remarkable that even under these conditions the estimated firm-level employment effects are so limited. This suggests that long-run aggregate employment effects could be much more disappointing. To an extent, this can be checked using macro data in empirical approaches that are complementary to firm-level analysis, such as the simulation of calibrated macro-econometric models (e.g. Gianella, 2006) or the estimation of impulse-response functions and long-run solutions of vector error-correction models (e.g. Altavilla et al., 2005). Results from these dynamic macro analyses suggest that when all elements of work-sharing policies are taken into account (including flanking policies and the financing of subsidies), their long-run effects on aggregate employment and (especially) potential output are unambiguously negative.

**Interactions with other factors and institutions**

The report points out that shorter workweek policies are usually coupled with other changes in working conditions, such as increased work flexibility, which are either legislated or negotiated among social partners. To assess the pure impact of shorter hours on employment it is thus essential to discount the effects of such concomitant changes. However, it is not clear that the empirical analyses always do so effectively. For instance, no attempt to disentangle these effects appears to have been made in the empirical study of the German case. While in the study of the French case the authors acknowledge this issue, the fact that annualisation of working time was the counterpart to the adoption of 35 hours in firms that entered such agreements but was not necessarily implemented in other firms implies that the treatment group of firms differs potentially from the control group by more than just hours worked. A related issue here is that, apart from so-called
Aubry I firms, in which a 10% hours reduction was legally required to be eligible to subsidies, errors in measuring actual hours reductions in firms entering other kinds of arrangements can be significant, implying a potential firm heterogeneity within treatment groups that may also affect the analysis of the employment effects.

Similar problems may arise regarding the ability to control empirically for the concomitant effects of (changes in) other policies unrelated to work-sharing measures. This is because the authors’ approach only controls for policies that affect equally all firms having the same broad set of characteristics. However, it is possible that several policies (or policy changes) implemented over the sample period may have affected differently firms that adopted shorter hours and other firms. For instance, the effect of (changes in) employment protection or temporary work legislation, labour income taxation (aside from subsidies related to work-sharing agreements) and entry regulations may have induced different employment responses in the control and treatment group, blurring the estimated effects of the shorter workweek policies.

Considering other kinds of interactions, it is also particularly unfortunate that the hints of the theory chapter concerning the influence of product market competition and bargaining arrangements on the likely employment effects of shorter hours have not been investigated further in empirical analysis. For instance, aside from generic sectoral dummies, there is no attempt in the studies of France and Germany to control for the effects of market power or workers’ bargaining power at the sectoral or firm level. Yet, some sectoral and/or firm-level proxies for these factors are available (e.g. import penetration, markups, wage premia, sectoral union densities) and their independent influence or interactive effects with shorter workweek arrangements could have been explored to check the empirical relevance of the theoretical findings.

*Why do work-sharing arrangements have political backing?*

As pointed out in the report, work-sharing policies have often been presented as a “miracle cure” to both encouraging employment growth and improving the welfare of beneficiaries. Given that both their employment and welfare effects are doubtful on both a priori and ex post grounds, it is natural to wonder why these policies have received so much political backing in continental Europe. Unfortunately, both reports in this volume are silent on this issue. While Kramarz and co-authors are obviously not faulty in this respect, because the issue goes well beyond the measurement of the
“Labour market impact of work-sharing arrangements”, it is difficult to fairly assess the welfare effects of work-sharing policies without considering their real motivations. These relate obviously to two factors: workers either need more time for non-market activities or wish more time for leisure. These two motivations can be (and have been) analysed separately, even though admittedly the distinction between leisurely and productive activities is not so easy to make.

Let us examine the first motivation, which could be called “productive”. Work-sharing can be seen as a way to ensure an increase in the time devoted to investment in human capital or home production of certain services. For instance, according to survey data presented in the report, the wish to raise one’s own children (one form of investment in human capital) is a major factor behind the support for part-time arrangements in the Netherlands and a third of the beneficiaries of alternation schemes in Sweden uses time off work in personal education, child (or elderly) care and other activities (such as starting a company). Unfortunately, no data is presented on the use of the extra time gained through shorter workweek arrangements in France and Germany, but other sources of evidence suggest that in these countries (as well as in several other continental European ones surveyed in the report by Hamermesh and co-authors in this volume) time devoted to non-market activities is higher than in countries that work longer hours.

The crucial questions are: Why, in these countries, the services produced at home (e.g. elderly care) are not bought on the market? Why, do workers have to change their work contracts (by means of shorter hours, part-time or alternation schemes) to enhance their human capital (or their children’s) or diversify their activities? In principle, this “productive” motivation for shorter hours would not arise if marketable household services (including child and elderly care) were available and convenient (both for the buyer and the supplier), if work contracts were to provide for retraining periods and/or if job turnover was high enough to quickly ensure new job opportunities to workers that quit their post to continue their education or try new activities. But, as argued by many economists, in many of the countries where the “productive” motivation is strong, institutions and regulations in labour and product markets and tax systems are partly responsible for this lack of market flexibility, making the market for household services scarcely competitive, discouraging labour market participation of potential suppliers (e.g. women or immigrants), lowering job turnover and increasing unemployment spells, lowering incentives for on-the-job training, and
stifling markets for continuing education services.\(^1\) To the extent that the motivation for seeking work-sharing arrangements is a response to constraints due to inappropriate tax, labour and product market policies, encouraging such arrangements is obviously a suboptimal policy as opposed to changing the inappropriate policies themselves. Hence, in this context, work-sharing policies are likely to have distortive effects that go beyond those on employment.

Let us now examine the second motivation, which could be called “leisurely”. Here, the empirical results reported in the study by Kramarz and co-authors suggest that it amounts to the extraction of rents by labour market insiders. To the extent that there is wage compensation for insiders, no employment gains for outsiders (and possibly less opportunities for them to find a job due to higher labour costs at entry) and costly government subsidies, the suspicion is strong that these policies redistribute resources to insiders. For instance, an insider-outsider interpretation of the French and German stories is that, faced with pressures of unemployment on wages, unions (or their political proxies) may have opted for increasing total income (inclusive of the value of leisure) through shorter hours arrangements with full or partial wage compensation. This has gone at the expense of low-skilled unemployed and/or workers in non-unionised/non-sheltered firms who would find it more difficult to keep or find a job. As suggested in the French chapter a similar insider-outsider story may have applied among firms themselves, favouring the less productive at the expense of the others.

A similar insider-outsider story can be told in the Swedish case. Here, more employment-focused unions shy away from requesting shorter hours. However, redistribution in favour of insiders is obtained in other ways, including career-break programs.\(^2\) According to the data presented in the report, these programmes benefit mostly public sector employees with a relatively long career history, ensuring safe jobs and seniority pay rules, and extensive inside information concerning the workings of alternation schemes. At the same time, the report shows that gains for outsiders are very limited (if any), since the programmes are not targeted towards the long-term unemployed and workers that replace the beneficiaries of the schemes tend to “specialise” in these temporary replacement jobs. Thus, in the end, these schemes force taxpayers to trade the financing of unemployment benefits, which provide generalised income support for outsiders and facilitate job

\(^1\) Moreover, as suggested in several recent contributions including the report by Hamermesh and co-authors in this volume, entrenched habits (possibly originating from long-standing inappropriate policies and institutions) can lead to externalities and social norms that can reinforce the structural motivation for work-sharing.

\(^2\) Another much more widely-used means of shortening hours in Sweden is through a very generous system of sickness leave, but this “work-sharing” arrangement is not analysed in the report.
matching (with potential efficiency gains), against subsidies whose main purpose is to increase the welfare of the insiders that take career-breaks. Clearly, this has redistributive consequences and tends to distort labour market outcomes as well.

In conclusion, while it cannot be excluded that (in a second-best world) carefully-designed “productive” or “leisurely” work-sharing programmes could actually achieve improvements in labour market outcomes and social welfare, the evidence produced in the report by Kramarz et al. overwhelmingly suggests the opposite. However, their analysis would have been even more convincing if some of the potential motivations for the significant political backing that such programmes draw had been analysed, taking into account their interactions with labour and product market imperfections and the redistributive effects that they imply.
Figure 1

Source: OECD Employment Outlook
Introduction

If one would be interested in collecting songs about working hours obviously Dolly Parton's hit “9 to 5” - Workin' 9 to 5, what a way to make a livin' – from 25 years ago would be a classic to include. There are also much earlier songs. Perhaps one of the first songs about working hours was the “eight hour song” from the late nineteenth century. About 125 years ago American workers striving for shorter daily working hours would sing “we want to feel the sunshine, we’re sure that God has willed it, and we mean to have eight hours, we’re summoning our forces from shipyard, shop and mill, 8 hours for work, 8 hours for rest, 8 hours for what we will.” Indeed, the issue of working hours goes back a long time. In the eight hour day campaign some consumer products were even labeled as “product from an 8 hours factory”.

Not only songs but also the economic debate on working hours is quite old. Chapman (1909) for example advocates government intervention in reducing daily working hours. His line of reasoning concerns a reduction of the working day from 10 to 9 hours which would increase leisure of workers affecting their “mental vitality, culture, and character”, making workers “capable after a time of managing satisfactorily more complicated machinery, (...) be generally more responsible and trustworthy, and therefore less in need of continuous watching and directing.” In short reduced working hours would increase productivity of the workers involved. If so there is a collective interest of employers to come to an agreement on a 9 hours working day. However, there is an externality that prevents this. Because it takes some time before the productivity effects materialize employers have to make an investment. If some employers make this investment after a while their workers will have a higher productivity but then they also have an incentive to leave the firm and work at other firms at higher wages. In the words of Chapman, “the reforming employer would run the risk of paying the whole cost of the labor value created by shorter hours and getting little in return.” Therefore, Chapman advocates “state intervention in the hours of labor.” Otherwise, as
regards the working day, “uncombined employers might keep it longer than would be desirable from their point of view” because of “short-sightedness, or fear of incurring an expense the fruits of which other employers might reap.”

The economic and political debate about working hours has not yet come to a standstill. On the contrary, in countries like France and Germany working hours have been reduced in the past decades and the discussion whether working hours should be reduced further or be increased for that matter is still on-going. The chapter by Francis Kramarz and his co-authors presents an interesting overview of recent work on traditional work-sharing arrangements in France and Germany adding to that alternative experiences of work-sharing in Sweden and the Netherlands. I think the chapter is informative and up-to-date but before presenting my comments in more detail I will first discuss work-sharing and working hours in Europe in general terms.

Table 1: Changes in annual hours actually worked per employee (hours per year)

<table>
<thead>
<tr>
<th></th>
<th>1960-1975</th>
<th>1975-2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-10.5</td>
<td>-16.0</td>
</tr>
<tr>
<td>West-Germany</td>
<td>-25.2</td>
<td>-</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-21.0</td>
<td>-12.2</td>
</tr>
<tr>
<td>Sweden</td>
<td>-17.0</td>
<td>-0.9</td>
</tr>
<tr>
<td>Italy</td>
<td>-7.4</td>
<td>-7.4</td>
</tr>
<tr>
<td>U.K.</td>
<td>-11.0</td>
<td>-9.0</td>
</tr>
</tbody>
</table>

Note: The estimates are intended to include paid overtime and exclude paid hours that are not worked due to sickness, vacation and holidays, et cetera.

**Working hours in Europe – what's going on?**

To illustrate the issue of working hours and work-sharing arrangements I present some numbers for the four countries to which I add for reasons of comparison Italy and the U.K. Table 1 shows annual changes in annual working hours over two time periods, 1950 to 1975 and 1975 to 2004. For almost every country annual working hours have decreased a lot in both time periods. The only exception is Sweden where in the most recent time period annual working hours stayed roughly the same. France is the only country where the annual fall in working hours is larger in the second period. In Italy the average fall in working hours is smallest, but still on average 7.4 hours per year. This accumulates to a drop of 360 annual working hours over the whole time period, from
Table 2 Anatomy of a typical working year for dependent employees; hours per year and per capita; 2002

<table>
<thead>
<tr>
<th></th>
<th>Hours/week</th>
<th>Weeks/year</th>
<th>Hours/year</th>
<th>Empl. rate</th>
<th>Hours/person</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>36.2</td>
<td>40.5</td>
<td>1467</td>
<td>62.2</td>
<td>912</td>
</tr>
<tr>
<td>Germany</td>
<td>36.5</td>
<td>40.6</td>
<td>1480</td>
<td>65.3</td>
<td>966</td>
</tr>
<tr>
<td>Netherlands</td>
<td>31.8</td>
<td>38.4</td>
<td>1223</td>
<td>74.5</td>
<td>911</td>
</tr>
<tr>
<td>Sweden</td>
<td>38.1</td>
<td>35.4</td>
<td>1349</td>
<td>74.9</td>
<td>1010</td>
</tr>
<tr>
<td>Italy</td>
<td>37.4</td>
<td>41.0</td>
<td>1533</td>
<td>55.6</td>
<td>852</td>
</tr>
<tr>
<td>U.K.</td>
<td>38.2</td>
<td>40.5</td>
<td>1546</td>
<td>72.7</td>
<td>1124</td>
</tr>
</tbody>
</table>

Note: hours per week on all jobs, including extra hours on main job and hours on additional jobs; annual weeks worked = 52 minus holidays and vacation weeks, absences due to non-holiday reasons and absences due to sickness and maternity; employment-population rate persons aged 15 to 64 years. The employment rate and the hours per person concern the population of 15 to 64 years.


Annual hours of work are influenced by the number of working hours per week and the number of workweeks per year. Table 2 presents the anatomy of a typical workweek. As shown, there is a wide range in the weekly hours, ranging from 31.8 in the Netherlands to 38.2 in the U.K.. The low number of weekly hours in the Netherlands has to do with the high share of part-time employment. Similarly, there is also a wide range in the number of workweeks per year, from a low 35.4 weeks in Sweden to a high 41.0 weeks in Italy. Since in Italy and the U.K. both the number of weekly working hours and the number of annual working hours are highest, the numbers of annual hours worked are also the highest, more than 1500 hours per year. The annual number of working hours is lowest in the Netherlands. Table 2 also presents information about the average number of working hours per head of the working age population. Here too, there is a wide variation which is mainly determined by differences in the employment-population rate which is lowest in Italy and highest in the Netherlands and Sweden. The smallest number of per capita working hours are for Italy while the largest number is for the U.K.

What can be derived from these numbers? Well, it is clear that there is work-sharing in different formats. First, there is work-sharing because the weekly working hours of full-time jobs are low; this is the format of France and Germany. Second, there is work-sharing because on average workers don't work many weeks per year, which is the example of Sweden. Third, there is part-time work, which is the example of sharing work in the Netherlands. And, perhaps, fourth there is a low employment rate, which is the example of Italy although this is more an example of
not-sharing work.

An important way to share working hours in some countries is part-time labor. In theory, part-time employment is agreed between workers and employees. Part-time jobs provide flexibility to both sides of the labor market; part-time employment enables employers to match staffing and production requirement and enables employees to match working hours with family life. However, a choice for part-time work is not always a voluntary choice for employees. Some part-time workers prefer to have a full-time job. Table 3 gives an overview of the share of involuntary part-time work among part-time workers.

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th></th>
<th>Men</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part-time labor</td>
<td>Involuntary part-time labor</td>
<td>Part-time labor</td>
<td>Involuntary part-time labor</td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>b)</td>
<td>a)</td>
<td>b)</td>
</tr>
<tr>
<td>France</td>
<td>25</td>
<td>39</td>
<td>6</td>
<td>53</td>
</tr>
<tr>
<td>Germany</td>
<td>31</td>
<td>13</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Netherlands</td>
<td>55</td>
<td>5</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Sweden</td>
<td>23</td>
<td>31</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>U.K.</td>
<td>41</td>
<td>10</td>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>

a) Part-time jobs as a percentage of all jobs.
b) Involuntary part-time jobs as a percentage of all part-time jobs.

Note: Part-time employment refers to persons who usually work less than 30 hours per week in their main job. Data include only persons declaring usual hours. Note also that for Italy no data are available.


Both for men and women there is a wide range. For men the range is from a low 8% in the Netherlands to a high 53% in France; for women the range is from a low 5% in the Netherlands to a high 39% in France. For men there is not a lot of cross-country variation in part-time work but for women there is a clear negative relationship between the incidence of part-time work and the share of females that works part-time involuntary. In France and Sweden where about a quarter of the female employees worked part-time, 30 to 40 percent of them preferred a full-time job. In the Netherlands where 55% worked part-time only about 5% preferred a full-time job. In the U.K. about 40% of the females employed worked part-time and about 10% of them preferred a full-time job. Apparently, in a situation where there are many part-time workers part-time work is more attractive. This may have to do with unions being more interested to represent part-time workers once their number is sufficiently large. Or, it may be that part-time work can only grow if it is sufficiently attractive for workers.
In the Netherlands the huge increase of part-time labor is a combination of several developments. For employers part-time jobs are useful because they give flexibility to allocate more labor towards weekly peak hours in production (for example in retailing) and because it attracts new labor supply. Females that withdrew from the labor market for family reasons return to take up part-time jobs and females that would otherwise have left the labor market are now staying in part-time jobs. So, the effective labor supply has increased. For females part-time jobs are valuable because they allow them to combine paid work with childcare. The increase in part-time jobs has had a positive effect on employment growth. Because effective labor supply increased many firms could expand their business. Part-time labor is not just a redistribution of a fixed amount of labor over a larger number of workers as is confirmed in a study by Van Lomwel and Van Ours (2005) in which it is argued that the growth of part-time labor even may have had positive effects on the growth of full-time labor. Sometimes one can't help thinking there must be something like a “butterfly effect” where small initial changes induce a series of interacting major changes. Initially a couple of employers opened up positions for part-time workers which they filled quite easily which led other employers to do the same which induced females who wanted to enter the labor market started searching for part-time jobs which made it even more easy for employers to fill their part-time job vacancies and when a sufficient number of females were working part-time unions got interested, the quality of the part-time jobs went up which led to more labor supply et cetera.

**Labor market effects of work-sharing arrangements**

The common element in the evolution of working hours in every country is the downward trend in the average working year for the average worker. This is not work-sharing per se but this trend may not be unrelated to the strong increase in female employment rates that occurred in the past decades in every European country. The ways in which the reductions in annual working hours were achieved differ a lot between countries. From the information provided in the chapter it is clear that the differences concern various dimensions. First, in terms of forced versus voluntary reduction of annual working hours it is France versus the other countries. In France there was a strong government influence; hence massive subsidies were needed to smoothen the transition to shorter weekly working hours. Second, in terms of union opposition against part-time work it was the Netherlands versus the others. Whereas in the Netherlands unions gave up their resistance
against the introduction of part-time work – as soon as they realized the potential for growth of union membership – in the other countries union resistance seems to persist under the heading of “part-time jobs = inferior jobs”. Third, in terms of availability of childcare facilities it is also the Netherlands versus the others. Whereas in the Netherlands the availability of child care facilities is still rather limited this is not the case in France, Germany and Sweden. Fourth and final, characterizing the work-sharing policies there is a dichotomy of France and Germany versus the Netherlands and Sweden. France and Germany have “macho” labor market institutions oriented towards protecting the interest of male full-time workers with the main issue being the reduction in weekly working hours; the difference being that in Germany this was introduced through negotiations while in France this was imposed by the government. The Netherlands and Sweden have “family oriented” labor market institutions which make it easier for employees to combine work and family life, i.e. raising children; the difference being that in Sweden leave facilities are the main instrument while in the Netherlands this is part-time labor.

Kramarz et al. also make an interesting contribution to the discussion on work-sharing arrangements in their theory section. Like in a monopsony market where a small increase in minimum wage may have positive employment effects but a large increase may reduce employment this theoretical model shows that there may be a small range over which working-time reductions can lead to an increase in employment whereas a large working-time reduction will be at the expense of employment. The explanation of this phenomenon is in the non-competitiveness of the labor market. Because of monopsony or bargaining power labor market imperfections arise which can only be balanced through government intervention. Unfortunately on the alternative routes of work-sharing, in the Netherlands and Sweden, the theory presented does not have a lot to offer. It would have been nice if the authors would have provided some extensions to their model in which part-time labor was introduced. After all, part-time labor is interesting because to a large extent part-time labor is a voluntary phenomenon. Furthermore, making part-time jobs available can stimulate labor supply. It is rather easy to show in a simple static labor supply framework that if a worker only has two options – work zero hours or work full-time – he or she will choose zero working hours while if the same worker is confronted with three options – zero hours, part-time or full-time – he or she may be inclined to accept a part-time job.

It is clear from the chapter that when it comes to work-sharing France has the worst of all worlds. Sweden and the Netherlands did not or did hardly face weekly working hours reductions.
Germany also faced weekly working hours reductions but it was the outcome of negotiations between unions and firms and recently these negotiations opened up the possibility for longer working hours. France had government imposed working hours reductions. Whereas in the Netherlands work-sharing was established through voluntary part-time work, in Sweden there was hardly any reduction in annual working hours over the past decades and in Germany in some companies weekly working hours have even expanded to increase economic efficiency. France is confronted with government interventions leading to decreasing productivity and rising wages. Overlooking the evidence presented by the authors one cannot help thinking that the title of the conference that emphasizes differences between Americans and Europeans could also have been stressing differences between Europeans with France being the outlier.
References


Final Remarks

by

Olivier Blanchard

As always at this annual conference, there is a lot to digest in the two papers that have been presented and discussed. Let me organize my comments around two themes.

1. The complexity of labor markets (even just for macro purposes)

In comparing labor markets either across countries or over time, we often end up focusing on differences in unemployment rates. Thinking of only two states, employment or unemployment, is indeed convenient. But it is only a convenient fiction.

Both papers make clear that, even if our goal is to understand the macroeconomic performance of an economy, it is essential to (1) decompose time in many more categories: maintenance (sleep,...); leisure; home work; search for market work (unemployment); and finally market work, and (2) take into account that people make choices among those categories, both at high frequency (market hours per week, number of weeks of vacation), and at low frequency (retirement age). Only by decomposing between these categories, and looking at the many dimensions of choice, can one hope to disentangle the role of preferences versus institutions in determining choices between work and leisure.

In the context of the comparison between Europe and the United States, recent debates have focused on the relative importance of leisure, home work, and market work in the two economies. An important contribution of the first paper is to give us carefully constructed basic facts. One way of summarizing the very rich findings of Table 1 of that paper is to ignore ”maintenance” (and

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1 Comments on the papers presented at the Rodolfo Debenedetti conference on “Are Europeans lazy, or Americans crazy?”, Portovenere June 2006.
unemployment?) and derive the proportions of the remaining time spent in leisure, home work, and market work. The numbers look as follows:

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Germany</th>
<th>Italy</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leisure</td>
<td>0.42</td>
<td>0.43</td>
<td>0.47</td>
<td>0.49</td>
</tr>
<tr>
<td>Home work</td>
<td>0.26</td>
<td>0.31</td>
<td>0.28</td>
<td>0.27</td>
</tr>
<tr>
<td>Market work</td>
<td>0.31</td>
<td>0.25</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>Total work</td>
<td>0.58</td>
<td>0.57</td>
<td>0.52</td>
<td>0.51</td>
</tr>
</tbody>
</table>

In words:
- People enjoy less leisure in the United States than in Europe.
- People spend less time in home work in the United States than in Europe.
- People spend more time in market work in the United States than in Europe.

Put another way, the facts show that neither the pure “Blanchard-Prescott” description of facts (less market work in Europe fully reflected in higher leisure in Europe) nor the pure “Freeman-Schettkat” description of facts (less market work in Europe fully reflected in higher home work in Europe) are correct. The reality is in between.

Given these facts, it is tempting to take a gigantic leap and guess how GDP statistics would look for the four countries above if GDP also included --as in principle it should-- the value of home work, or even the value of home work plus the value of leisure.

The first line of the table below gives PPP GDP per capita, using the conventional measure, i.e. the value of market work, with the US value normalized to one (the original numbers come from the OECD). As is well known, PPP GDP per capita is 20% to 25% higher in the United States, reflecting mostly the higher proportion of market work in the United States.

The second line gives relative PPP GDP per capita, when both market and home work are included. The crucial ingredient here is the relative price of home work in terms of market work. This relative price is surely less than 1, reflecting the tax wedge between home and market work-coming from
consumption taxes, income and payroll taxes. I use a relative price of 0.8. Because of the higher proportion of home work in total work in Europe, the differences between the United States and the three European countries are much smaller than for the standard measure. The differences become even smaller in the third line, in which I include leisure, assuming the relative price of leisure as being the same as for home work. These computations should be taken with more than a grain of salt, but they show the importance of taking into account home work, and the need for a better understanding of the determinants of market versus home work.

<table>
<thead>
<tr>
<th>GDP (market work)</th>
<th>US</th>
<th>Germany</th>
<th>Italy</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (total work)</td>
<td>1</td>
<td>0.77</td>
<td>0.81</td>
<td>0.74</td>
</tr>
<tr>
<td>GDP (including leisure)</td>
<td>1</td>
<td>0.93</td>
<td>0.89</td>
<td>0.85</td>
</tr>
</tbody>
</table>

2. Leisure, home work, market work: Preferences versus institutions and distortions?

The Prescott side of the debate about the respective evolutions of work and leisure in the United States and Europe (the debate that triggered this conference) has proceeded under two maintained assumptions, (1) that preferences were similar across countries, and (2) that preferences were such that there was no trend in labor supply as productivity increased (with income and substitution effects canceling each other along the balanced growth path).

This should clearly be the starting point. But my reading of the evidence is that it cannot be the ending point. I shall give two pieces of evidence in favor of my argument.

The first is a piece of time-series evidence, on hours worked per week in manufacturing in the United States for various years between 1909 and 1940. I choose that period because it predates most of the growth of the tax wedge between leisure and work, which plays a central role in Prescott's interpretation of the leisure/work choice. The numbers are given in the table below. The evidence is striking. In 1909, only 8% of workers worked less than 48 hours. In 1929, the proportion had increased to 46%, and in 1940 it had reached 92%. It is hard not to see a strong income effect at work, and it is surely impossible to blame the tax wedge for this evolution.
The second relies on cross-country evidence, and comes from the paper we saw this afternoon, and the survey answers about Dutch attitudes towards the division of work between husbands and wives, about child rearing, and about child care. The answers to some of the questions are likely to reflect both preferences and institutions, and thus do not shed light on the issue at hand (differences between preferences across countries). The question which seems best suited for our purposes is the question asked in their table 4, on “the 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”. The percentage of those who agree strongly with the statement is substantially lower in the Netherlands (and Germany) than in France, Denmark, and Sweden. I am sure that these apparent differences in preferences can in turn be explained by history, religion, and so on. But this does not matter: today, preferences are different in the Netherlands than elsewhere in Europe. Thus, choices between leisure, home work, and market work, are likely to differ, even with the same institutions and tax rates.

Even those (like me) who believe that preferences differ across countries, also believe that institutions and distortions play an important role. The question is which ones. Let me make a number of remarks and guesses here.

- The tax wedge, on which Prescott focuses, is likely to be more relevant for the choice between home and market work than for the choice between market work and leisure. The reason is a simple one: In the second case, the substitution effect is potentially undone by the income effect. In the first, there is, to a first approximation, no income effect to cancel the substitution effect.

- The effect of the tax wedge and other programs depends on the shape of the home production function and the degree of substitutability between market and home produced goods. The evidence from the work by Jon Gruber on (nearly) free child care in Quebec is useful in giving

<table>
<thead>
<tr>
<th>Hours</th>
<th>1909</th>
<th>1919</th>
<th>1929</th>
<th>(1940)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 48</td>
<td>7.9</td>
<td>48.6</td>
<td>46.0</td>
<td>(92.1)</td>
</tr>
<tr>
<td>49-59</td>
<td>52.9</td>
<td>39.3</td>
<td>46.5</td>
<td>(4.9)</td>
</tr>
<tr>
<td>≥ 60</td>
<td>39.2</td>
<td>12.1</td>
<td>7.5</td>
<td>(3.0)</td>
</tr>
</tbody>
</table>

Source: Historical Statistics of the United States
us a sense of magnitudes here. (The fact that this program was introduced in Quebec but not in other Canadian provinces provides a nearly natural experiment.) Jon finds that the effect of the program was to increase the participation of women with children between 0 and 4 years of age by seven percentage points. Whether this is large or small is not obvious. Jon concludes that it is large. I find it small, showing that a large subsidy is still not enough to induce most women to rely on child care.

- The choice between market and home work is likely to depend on many institutional factors beyond the tax wedge. To take the example in the previous paragraph, free child care may be the most important factor for women with young children. But other institutions matter in less obvious ways. Whether or not one decides to take care of one's garden depends on the price of gardeners and gardening service firms. The minimum wage is likely to play an important role. So is employment protection, which very much affects the cost of running small firms and thus the price of gardening services.

- One may have a relatively benign view of the shift from market to home work. The image is of a woman who decides to interrupt her career to stay home with her children, or of the man who decides to cut the grass rather than hire a gardener. But there may be more to the story. The woman who used to provide child care may have few other skills, and the same may be true of the gardener. Minimum wage or other constraints on the wage may lead them to become and remain unemployed. The result in this case is less market work, more home work, and more unemployment.

- Distortions may come not so much from taxes and subsidies, than from the complexity of the regulations. This remark is triggered by the dramatic differences, described in the second paper, between the introduction of “work sharing” in the Netherlands and in France. In the Netherlands, the change in regulations to allow for an increase in part time work appears to have been worked out with the various social partners, so as to allow maximum flexibility for firms and for women. In France, nearly the opposite is true: The introduction of the 35 hour week has come with a Kafkaesque complexity, requiring all the knowledge of a Francis Kramarz to explain it to us in the second paper (it seems inconceivable that any firm understands the legislation...) The complexity of regulation is hard to measure; I am sure however it has major deadweight costs.
Patterns of Market Work: Some Facts

In the light of the provocative title of this Conference, it may be a good idea to rehearse some of the relevant facts. Before plunging in to the data, it is important to recognise that these have been built up from a variety of sources which may not be wholly suited to making cross-country comparisons. They do, however, give us a flavour of the story.

In Table 1, we present a measure of the total market labour input per person of working age. We also see how this divides into employment per person and hours per employed individual. Looking first at the total measure, we see huge variations across countries. Some broad groupings stand out. The Anglo-Saxon countries (excluding Ireland) have the highest labour input and Japan slots into this grouping. The Scandinavian countries (excluding Norway) are the next highest group and Switzerland fits into this group. The “Big Three” of Continental Europe, France, Germany and Italy, are right at the bottom. The Anglo-Saxon countries provide around 39% more market work than the Big Three and the Scandinavian group around 27% more. So the Scandinavians are much closer to the Anglo-Saxons than to the Big Three. This immediately suggests that looking at these matters in a “Europe versus US” framework is a hopeless strategy.

Looking at the hours/employment rate breakdown, the Scandinavian countries have the highest employment rates and the Anglo-Saxon countries have the highest numbers of hours worked per year by those in work. The Big Three have low levels of both, although the Netherlands and Norway stand out as having the lowest hours worked, in the former case because of the large numbers of part-timers as analysed in the Netherlands chapter (Kramarz et al., 2006, Chapter 5). In Table 2 we see how the annual hours data break down into hours per week and weeks per year. The latter tend to exhibit more variation than the former. For example, Americans tend to work over 14 per cent more weeks per year than the French and Germans but only 8 per cent more hours per
week. Overall, weekly hours worked by those in work contribute less than one quarter of the total difference in market labour input per capita between the United States and France and Germany.

It is interesting to compare these data with the time-use data reported in Burda et al. (2006). In Table 3, we see that the market work numbers generated by the time-use data are larger than those in Table 1, mainly because the time-use data do not fully capture vacations and holidays. Nevertheless, the correlation between the two measures of market work is 0.76 and the correlation between the measure of market work in Table 1 and all work (market work plus home work) in Table 3 is 0.55. So the two data sources are telling similar stories.

The History of Work Patterns

In Table 4, we present the history of total market labour input per capita. Back in the early 1970s, the Anglo-Saxon countries, the Scandinavian countries and two of the Big Three, France and Germany, all had the same level of market labour input per capita at around 24 hours per week. By contrast, total labour input in Italy and the Netherlands was far lower at around 19 hours per week. Since then, labour input in the Anglo-Saxon countries has hardly changed, in the Scandinavian countries it has fallen a little (except Norway) and in France and Germany the fall has been substantial.

Looking just at the employment/population rate, we see in Table 5 that the employment rate in Scandinavia has always been high because of high participation rates among women. In France and Germany, in the early 1970s, employment rates were comparable with the Anglo-Saxon economies and they were low in Italy and the Netherlands because of low female participation. Since then, there have been some changes but the overall picture is one of rising female participation along with some fall in the participation of men.

Turning to hours per year, we see in Table 6 that there have been some significant changes in the last three decades. In the early 1970s, hours per year were much the same in all the countries although the numbers in Norway and Sweden were lower than average despite their extremely buoyant labour markets. Since then, the falls in hours per year have been very different in the various countries. France, Germany, and the Netherlands have seen falls of around 500 hours, Norway and Japan falls of around 400 hours and Ireland and the UK declines of around 300 hours.
By contrast, the falls in Sweden, Australia, Canada and the US have only been around 100 to 150 hours.

Some Important Features of these Changes

Prime-age men (25-54)
In this group, non-employment has risen almost everywhere, mainly due to increasing inactivity. Today, those countries with prime-age male inactivity above 9% are Finland, Norway, Sweden, the UK, Australia and the US. This is a somewhat curious collection because these are nearly all countries with high levels of total labour input per capita. By contrast, for example, the European Union average level of prime-age male inactivity is 7.6%. A significant proportion of the increase in inactivity since the early 1970s may be attributed to the operation of the disability benefit system. So we find that among inactive prime-age men in the high level countries, a good proportion are categorised as long-term sick or disabled.

Older men (55-64)
In the early 1970s, inactivity rates in this group were nearly all below 25%. Italy was the outstanding exception at over 40% because even then, the official retirement age was only 60. By 2004, inactivity rates in this group were nearly all above 25%. But there are big variations. In the Big Three and Belgium, the inactivity rate exceeds 50%. In most of Scandinavia (except Finland) it remains around 25% with the Anglo-Saxon countries around 32%. The big changes were basically down to early retirement incentives typically introduced on the back of the work-sharing arguments discussed extensively in Kramarz et al. (2006).

Prime-age women (25-54)
Inactivity rates among prime-age women have generally come down since the early 1970s, in some cases hugely, such as in the Netherlands. It still remains fairly high (over 30%) in Spain and Italy. And this is not because women there are looking after children. Indeed, these two countries now have the lowest fertility rates in the OECD and, more generally, fertility rates and female participation rates are now positively correlated across European countries. As well as tax structures and employment protection rules, barriers to, and preferences about, part-time work are important here. For example, in Finland and Spain, few women work part-time and most of these

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1 See Faggio and Nickell (2006) for more detail.
would rather not. By contrast, in the Netherlands most women work part-time and the majority of these do not want a full-time job.

**Vacations and holidays**

One of the interesting features of the data on annual working hours is that almost all countries except the US have legal minima on paid annual vacations in excess of four weeks. With national holidays adding an extra two weeks or so, most workers in the OECD get at least six weeks holiday per year. In the US, the average is a little below four weeks. Furthermore, these legal minima have risen steadily since the early 1970s, at different rates in different countries.

**Sickness absence and maternity leave**

There are significant variations in the extent of annual weeks of short-term sickness absence and maternity leave, much of which can be explained by variations in the benefit systems across countries as well as the behaviour of general practitioners. The benefit systems tend to be most generous in Scandinavia and least generous in the Anglo-Saxon countries.

**Overall hours per year**

As well as the negative effects of taxes and employment protection rules, a significant factor which is strongly positively related to annual hours is the extent of earnings dispersion. Bowles and Park (2005) argue that this arises because of the “Veblen effect”. Based on the ideas in Veblen (1934), the argument is that households consume goods not only for their own sake but to impress the neighbours. With more dispersed earnings, additional work effort is required to make the appropriate impression. By contrast, Bell and Freeman (2001) argue that increased earnings dispersion induces longer hours because it raises the incentives to work harder in order to move up the earnings ranking.

**Some Overall Conclusions**

Some of the stories which have been proposed to explain variations in market work are as follows. The first, which is frequently used to explain cross-country variations in labour input, is based on labour taxes, a recent example being Prescott (2004). The evidence we possess indicates that taxes cannot be the whole story. The tax story is inconsistent with the small tax effects on
labour inputs generated by microeconometric studies (Alesina et al. 2005) and those generated by cross-country studies (Nickell, 2003).

A second story is in the same spirit as the tax story but adds in all the other elements of the social security system including early retirement benefits, sickness and disability benefits, unemployment benefits and so on. These are certainly good at explaining the changes in some aspects of the labour input, notably inactivity among men, both prime age and old, as well as a part of the changes in unemployment and female participation. But shifts in annual working hours are a major part of the story and here, while labour taxes have a significant impact, they explain only little of the overall picture (see Faggio and Nickell, 2006).

A third story is that favoured by Alesina et al. (2005) who argue that the nexus of strong unions, generous welfare benefits and social democratic governments imply both high taxes and direct pressure towards less work. This latter is partly driven by work-sharing in response to adverse shocks and partly by the not unreasonable belief that long holidays are a good thing for workers, hence laws governing minimum levels of paid annual leave. In practice, all developed OECD countries bar the US have such laws, even those such as New Zealand and the UK where unionisation has collapsed. However, as we have seen in the relevant chapters of Kramarz et al. (2006), the work-sharing story applies clearly to Germany and particularly France, where incentives to reduce labour supply have consistently been applied in response to increases in unemployment, culminating in the imposition of the 35-hour week in France in the late 1990s.

However, as the relevant chapter in Kramarz et al. (2006) makes clear, it is hard to see how the work-sharing story applies to Sweden which has stronger unions, more generous welfare benefits, higher taxes and more social democratic governments than either France or Germany. Yet it has one of the highest employment rates in the OECD and only a small fall in labour input since the early 1970s. Thus, overall labour input in Sweden was 3% below that in France and Germany (average) in 1970 and 26% above in 2004. Both Italy and the Netherlands also had only small falls in labour input from 1973 to 2004, but for very different reasons. In both countries, labour input in 1973 was exceptionally low. In Italy this was because female participation was very low, with an employment rate of around 30%. Furthermore, the retirement age was 60 for men and 55 for women, at least five years younger than in any other European country. For example, it was 67 for both men and women in Denmark and Sweden. So it is no surprise that in 1973 and, indeed, even in the 1960s, Italy had the lowest employment rate in the OECD. And it still does. Add in only a
modest fall in annual hours and we find only a small fall in overall labour input. There is no strong element of work-sharing here. Indeed, the Italian labour market model, with minimal welfare benefits and very strong employment protection, places a great deal of weight on the position of the male head of household, which is not to be undermined either by the presence of a high earning wife or by the loss of a job. Thus the unemployment rate of husbands at 2% was, in 1992, among the lowest in the OECD (see OECD, 1994, Table 1.19). While the labour input in the Netherlands was also exceptionally low in 1973, the subsequent history is completely different. The employment rate of women in 1973 was extraordinarily low in the Netherlands at 28.6% but by 2004 it had risen to 65.7%. As a consequence the overall employment rate had risen by 17 percentage points, by far the largest increase in the OECD. But the majority of women in employment in the Netherlands work part-time, so average annual hours fell dramatically. The overall consequence of this was that the total labour input had barely changed by 2004, although it has increased by around 20 per cent since the Wassenar agreement of the early 1980s.

From all these different histories, it is clear that there is no simple story which can explain what is going on. If we take groups of apparently similar countries, even then we find considerable within group variations. For example, in the “Anglo-Saxon” group, Australia, Canada, New Zealand, UK, US, all have a high level of labour input at present. Yet while Australia and Canada continue to have a strong union presence and Canadian labour taxes have risen significantly, their labour input has risen whereas, in the UK, union membership has collapsed since the 1970s and labour taxes have not increased, yet labour input has fallen by nearly 12% since 1973. Compared to this group, the Scandinavian group (Denmark, Finland, Sweden) has, and always has had, very high employment rates, very strong unions and very rapid increases in labour taxes. Yet their labour inputs have not fallen rapidly and are only around 10 per cent lower than in the Anglo-Saxon group. By contrast, the major countries of Continental Europe, France and Germany, where unions are weaker and taxes have risen less rapidly, work-sharing strategies have been embraced wholeheartedly and labour inputs have fallen dramatically in the last thirty years.

The upshot of this is that there is no clear, simple story which will explain the cross-country pattern of market labour inputs over the last forty years. The incentives embedded in the tax and social security systems of the different countries are clearly important and explain many features of the pattern. But they are far from being the whole story. Trade unions, and indeed the population at large, have embraced work-sharing strategies in response to adverse shocks in France and Germany. This has helped to drive down annual working hours by around 500 since the early 1970s. This
liking for work-sharing strategies is not, however, shared in the more corporatist societies of Denmark, Sweden and Finland perhaps because they have a different view of how the economy works (see Saint-Paul, 2004). Here the tax/legal framework is used to enhance work/life balance, with very high labour force participation and relatively stable annual hours, which have fallen little over the last thirty years despite numerous adverse shocks.

Broadly speaking, we can discern three groups of countries, Anglo-Saxon, France/Germany, Scandinavia where there is some sort of coherent story to be told about their patterns of market labour input and the role of taxes, benefits, unions and other labour market institutions. But further countries, such as Italy and the Netherlands, do not fit into any of these three groups, and different explanations of their labour input patterns are required. Overall, while it is plain that the tax/benefit system and unions and other labour market institutions are important in explaining labour input patterns across the OECD, other factors are involved which are not easy to identify but lead to substantial differences from one country to another.
Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Weekly hours worked per person of working age (2x3 ÷ 100)</th>
<th>Employment/Population of working age (%)</th>
<th>Annual hours actually worked by workers ÷ 52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>20.5</td>
<td>68.2</td>
<td>30.1</td>
</tr>
<tr>
<td>Belgium</td>
<td>17.8</td>
<td>59.7</td>
<td>29.8</td>
</tr>
<tr>
<td>Denmark</td>
<td>21.5</td>
<td>76.4</td>
<td>28.1</td>
</tr>
<tr>
<td>Finland</td>
<td>22.5</td>
<td>67.7</td>
<td>33.2</td>
</tr>
<tr>
<td>France</td>
<td>17.5</td>
<td>62.2</td>
<td>28.1</td>
</tr>
<tr>
<td>Germany</td>
<td>18.2</td>
<td>65.3</td>
<td>27.8</td>
</tr>
<tr>
<td>Ireland</td>
<td>20.8</td>
<td>65.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Italy</td>
<td>17.1</td>
<td>55.6</td>
<td>30.8</td>
</tr>
<tr>
<td>Netherlands</td>
<td>19.1</td>
<td>74.5</td>
<td>25.7</td>
</tr>
<tr>
<td>Norway</td>
<td>19.9</td>
<td>77.1</td>
<td>25.8</td>
</tr>
<tr>
<td>Portugal</td>
<td>22.2</td>
<td>68.1</td>
<td>32.6</td>
</tr>
<tr>
<td>Spain</td>
<td>20.8</td>
<td>59.5</td>
<td>34.9</td>
</tr>
<tr>
<td>Sweden</td>
<td>22.8</td>
<td>74.9</td>
<td>30.4</td>
</tr>
<tr>
<td>Switzerland</td>
<td>22.9</td>
<td>78.9</td>
<td>29.0</td>
</tr>
<tr>
<td>UK</td>
<td>23.6</td>
<td>72.7</td>
<td>32.5</td>
</tr>
<tr>
<td>Australia</td>
<td>24.3</td>
<td>69.2</td>
<td>35.1</td>
</tr>
<tr>
<td>Canada</td>
<td>23.8</td>
<td>71.5</td>
<td>33.3</td>
</tr>
<tr>
<td>Japan</td>
<td>23.6</td>
<td>68.2</td>
<td>34.6</td>
</tr>
<tr>
<td>NZ</td>
<td>25.3</td>
<td>72.4</td>
<td>34.9</td>
</tr>
<tr>
<td>US</td>
<td>24.9</td>
<td>71.9</td>
<td>34.6</td>
</tr>
</tbody>
</table>

Sources: Employment/Population: OECD Employment Outlook, 2004, Table B. Annual Hours: OECD Employment Outlook, 2004, Table F. Col. 1 is the total number of hours worked by the population of working age in 2002 divided by 52 x the population of working age.
### Table 2

**Annual Hours actually Worked and its Components**

<table>
<thead>
<tr>
<th>Components of weeks worked</th>
<th>1 Annual hours actually worked by workers</th>
<th>2 Average weekly hours by those in work</th>
<th>3 Weeks worked per year by those in work</th>
<th>4 Vacations and holidays</th>
<th>5 Other(^b) absences (52-3-4.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Austria</strong></td>
<td>1567</td>
<td>38.4</td>
<td>40.8</td>
<td>7.2</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Belgium</strong></td>
<td>1547</td>
<td>36.3</td>
<td>42.6</td>
<td>7.1</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Denmark</strong></td>
<td>1462</td>
<td>36.3</td>
<td>40.3</td>
<td>7.4</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>1726</td>
<td>38.8</td>
<td>44.5</td>
<td>7.0</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>France</strong></td>
<td>1459</td>
<td>36.2</td>
<td>40.3</td>
<td>7.0</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td>1443</td>
<td>36.5</td>
<td>39.5</td>
<td>7.8</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td>1666</td>
<td>36.3</td>
<td>45.9</td>
<td>5.7</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td>1599</td>
<td>37.4</td>
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**a.** The data refer to all workers, both full-time and part-time, and to full year equivalents. So, hours per year refers to those working a full year. Numbers in parenthesis are negative.

**b.** Includes absences due to illness, maternity, labour disputes, training and other reasons.

**Sources:**
- Column 1. OECD Employment Outlook, 2004, Table F.
- Column 2. OECD Employment Outlook, 2004, Table 1.5.
  For US, Alesina et al. (2005), Table 1.
- Column 4. OECD Employment Outlook, 2004, Table 1.5.
  For US, Alesina et al. (2005), Table 3.
Table 3
Comparisons with Labour Inputs Derived from Time Use Studies

Average hours per week per capita

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Notes: The time use data are derived from Burda et al. (2006), Tables 1.1, 1.4. The market work numbers in the time use data are larger than those in Table 1 because they do not typically include vacations and holidays.

Correlations
Cols. 5. and 1., 0.76. Cols. 5. and 2., -0.33.
Cols. 5. and 3., 0.55. Cols 5. and 4., -0.15.
### Table 4

**Total Labour Input**
Weekly hours worked per person of working age

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*Source: Based on Tables 5 and 6. Annual hours ÷ 52 x employment rate.*
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**Source:** OECD Employment Outlook, 1995, Table A; 2005, Table B and OECD Labour Market Statistics

**Note:** Vertical lines reflect breaks in the series

**Definition:** Total employment ÷ population of working age (15-64)
### TABLE 6
Average Annual Hours Worked Per Person in Employment

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1 Dependent Employment
2 West Germany
3 2003

Source: OECD Labour Market Statistics
References


Final Remarks

by

Guido Tabellini

1. Tastes vs Opportunities

We observe large differences in how individuals allocate their time between alternative uses, both within and across countries. Explaining these differences is in itself an interesting question. Whether or not these different time allocations have relevant policy implications depends on what is their explanation.

If different time allocations reflect differences in tastes, then we should not worry. If Europeans work less in the market because they like to do so, then the outcome is likely to be efficient. Even if the different tastes reflect externalities, as suggested by Alesina et al. (2004) and in the report by Burda et al., there is no compelling reason for government intervention. In Europe most labor relations are intermediated by large trade unions. If taste externalities were relevant, large unions would internalize them and collective agreements would enable individuals to coordinate on the efficient outcomes.

If instead different time allocations reflect different opportunities available to different groups of individuals or in different countries, then there is reason for concern. If Europeans work less because tax rates are too high, or because they cannot find employment at the going wage rate, or because rigid institutions prevent firms and individuals from signing more flexible working arrangements, then there are important policy implications. The observed outcomes reflect some underlying distortions, and it would be socially optimal to remove them.

Our task as economists is to discriminate between these two alternative kinds of explanations, and to identify the distortions that could explain the observed differences in time allocations. Unfortunately, it is not an easy task. In the cross country or time series data there is no simple and easy to interpret correlation between labor market outcomes and alternative measures of

\footnote{Final remarks presented at the conference held in Portovenere on May 2006 and organized by the Rodolfo De Benedetti Foundation. I am grateful to Giovanna D’Adda for research assistance.}
institutions or policies. When looking at the employment rates, they are quite similar in all countries if we consider the group of prime age males. Employment rates differ across countries mainly in specific groups in the population: the women, the elderly, the young. But at least some of these group-specific differences in employment rates across countries could be due to tastes as much as to institutions. A recent interesting paper by Algan and Cahuc (2005), for instance, finds that indicators of culture can easily explain the observed differences in the employment rate of females across countries.

2. Time use

This is why it could be potentially useful to look at individual time use data. Exploiting the individual variation could make it easier to discriminate between these alternative hypothesis, tastes vs opportunities. Unfortunately, as Alesina and Pissarides noted in their comments, the paper by Burda et al. stops short of that. Yet, the data that they have classified and described could be used for this purpose.

If we had the data, a simple and direct way to discriminate between tastes vs opportunities would be to ask whether people who work less in the market, or at home, are more or less happy compared to those who have chosen a different time allocation. Unfortunately, data on individual happiness are not available at the level of the same individual who has compiled the time use data. Nevertheless, there is something we can do along these lines.

The World Value Surveys have asked individuals living in various countries how satisfied they are with their lives (in a scale from 1 to 10). The answers to this question have been used by economists as measures of happiness (eg. Helliwell (2003), Layard (2005)). Cross country comparisons of average happiness in each country are difficult to interpret, because the answers are likely to reflect different meanings that the question might have in different countries, or cultural and genetic differences, or differences in other determinants of happiness, such as income, or the quality of government.

But the report by Burda et al. has stressed that there are interesting differences in average time allocations within countries, between males and females. A natural and interesting question, then, is whether these different time allocations within countries are also correlated with differences
in average happiness between males and females within the same country. Focusing on average gender differences in happiness is likely to remove many of the cultural, economic and institutional factors that might explain cross country differences in happiness. Any correlation (or lack thereof) between gender differences in time allocations and in happiness are then much easier to interpret.

Figure 1 plots the average life satisfaction of males and females for the 67 countries for which data are available, rescaled to lie between 0 and 1. The data refer to the last wave of the World Value Survey, around the year 2000. As expected, all observations lie very close to the 45 degree lines, meaning that on average males and females are equally satisfied with their lives in all countries (the solid line in Figure 1 is a regression line, but its slope is 0.996 and its intercept is 0.005, i.e. almost the 45 degree line). This remarkable gender equality in happiness contrasts sharply with the huge differences in happiness that can be observed across countries (ranging from 0.36 for Tanzania to 0.83 for Switzerland).

Are gender differences in happiness related to gender differences in time allocation or other labor market outcomes? Table 1 provides the answer. The first column regresses gender differences in happiness on male and female unemployment rates, plus a dummy variable for Italy (the source for the unemployment data is the ILO and unemployment is measured in the same year of the survey). I also always control for demographics, measured by the share of the population between 16 and 64 years of age (coefficient not shown).

As in Burda et al., Italy stands out as a country where women seem discriminated against more than elsewhere. Burda et al. found that Italian women work much more than Italian men (summing together time and home work), while total working time of males and females is the same in other countries. Here, we see that Italian women are significantly more unhappy than Italian men, compared to gender differences in other countries. This finding is remarkably robust to alternative specifications. It remains a puzzle as to why Italy is so different from other countries in this respect.

A second important result is that male and female unemployment is significantly related to gender differences in happiness, with the expected sign. In countries with more male unemployment and less female unemployment, women on average are significantly happier than men, and viceversa. This aggregate correlation confirms microeconomic studies that show that unemployment is an important determinant of life satisfaction.
The remaining two columns restrict the sample to 24 countries for which we could find time use data (the same countries discussed in the report by Burda et al.). Here, we add to the regression the percentage of total working time spent in the market by males and females, with and without the dummy variable for Italy. The time use variables are not statistically significant, while male and female unemployment remains significant (some of the estimated coefficients even increase in absolute value). Similar results are obtained with other measures of time allocation.

These results have several relevant implications. First, they suggest that much of labor economics is right to seek to explain unemployment, while neglecting other dimensions of time allocation. We ought to worry if individuals seek work and cannot find it at the going wage rate, while we should not worry too much about how individuals allocate their time, just as we don’t worry if they spend their income by going to an expensive restaurant vs buying a new tennis racket, or whether they spend their free time reading a book or watching a movie. How individuals allocate their time is a reflection of their tastes and optimal choices, and has no significant correlation with their happiness. The crucial question is why some of them cannot find the job that they are seeking, because this is what makes the difference between happy and unhappy individuals.

Second, these regressions suggest that the important question, when comparing Europe vs the US, has more to do with the extensive margin (why is the employment rate in Europe lower than in the US, and in particular why is the unemployment rate higher), rather than with the intensive margin (why do Europeans have a shorter working day in the marketplace than Americans). It is really the extensive margin that seems to be correlated with life satisfaction, while differences in hours worked in the market seem unimportant.

Finally, these regressions suggest that perhaps we should not try to interfere with time allocations through policy interventions. If Italian or Dutch mothers are happy to spend time at home with their children, why should the government subsidize child care centers to push them to work in the market place? Child care is something that can easily be provided by the market, without any government subsidy or intervention. Governments should be very concerned if unemployment rates are particularly high in specific groups of the population (youths, or ethnic minorities). But lower employment rates or shorter hours spent in the marketplace by women do not necessarily imply any market failure that needs to be corrected. It could just reflect the tastes and preferences of the individuals involved. The regressions displayed in Table 1 support this
interpretation and provide an argument against policy interventions that aim to modify time allocations.

3. Insiders vs Outsiders and the regulation of working time

Does this mean that all is well and there is no reason for concern, when comparing labor market outcomes in Europe vs the US? Certainly not. Not only because the unemployment rate is higher on average in Europe. But also because in many respects the low average hours worked are likely to reflect policy induced distortions or the monopolistic power of trade unions representing powerful insiders.

To a large degree, Europeans work less because they retire early. This is made possible by an overly generous pay as you go system that redistributes away from future generations (unrepresented at the political table), and that causes high unemployment and low labor supply through the implied tax distortions.

Europeans work less also because many of their youth remain unemployed for too long. This in turn is caused by an excessively rigid labor market, that protects the insiders with high firing costs, and leave the outsiders unemployed or without any protection at all.

In some European countries, women do not work at all because they face an all or nothing choice: collective agreements and labor market institutions in Southern Europe often discourage part time work, because they are designed or bargained for by unions that mainly represent male workers. If women had more flexible options for part-time work, some of them would work less in the market place, but others who currently only work at home would show up in the market place.

In other words, opportunities, and not just tastes, are likely to explain part of the differences in labor market outcomes between the US and Europe. As argued by Alesina et al. (2006), in Europe opportunities for working in the market place are often distorted to protect the “insiders”, who are over-represented in the collective agreements and in the political system. The bargaining system and the labor institutions that prevail in all European countries were created to protect labor from being exploited by capital. It has now become a tool whereby insiders extract rents at the expenses of the outsiders, typically young generations, women, immigrants.
One of the policy questions motivating this conference is whether we need government regulation of working time. This policy tool too was introduced to protect workers from being exploited by capital. But in the current institutional and political environment, it has become a very dangerous policy tool to use. As argued convincingly in the chapter by Kramarz et al., government interference with privately negotiated working time arrangements is likely to introduce additional distortions that give further rents to the insiders, while reducing work opportunities for the outsiders. Kramarz et al. provide a compelling case that working time arrangements should be left to private negotiations between firms and workers.

If anything, we should worry about the risk that these private negotiations are distorted to represent the narrow interests of the insiders, and hurt the outsiders. But the correct way to deal with this market failure is to curb the power of the insiders, not to regulate working time.

This could be done in at least two ways. One is to broaden the interests represented by the unions. If trade unions represent the interests of all potential workers, of women, of ethnic minorities, of the youth who face the risk of unemployment, then they are more likely to use their political and economic influence to seek efficient outcomes that benefit all. This is the route followed in some countries in Northern Europe. As argued by Kramarz et al., this change in the degree to which women were represented explains the surge of part time work in the Netherlands. The alternative route is to allow firms and workers to opt out of collective agreements, in the wage or time dimension, if they wish to do so. Germany has started experimenting along this route, with encouraging outcomes.

This is really the key challenge faced by many European governments when it comes to labor market policies: how to reduce the influence of the insiders. Meeting this challenge will remain one of the key priorities in Europe for the years to come.

Algan, Y. and P. Cahuc (2005), The Roots of Low European Unemployment: Family Culture?


Table 1. Gender differences in happiness and in labor market outcomes

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Life satisfaction</th>
<th>Female - male</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Female Unemployment</td>
<td>-0.11</td>
<td>-0.10</td>
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<tr>
<td></td>
<td>(0.05)**</td>
<td>(0.05)**</td>
</tr>
<tr>
<td>Male Unemployment</td>
<td>0.15</td>
<td>0.18</td>
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<td></td>
<td>(0.08)*</td>
<td>(0.08)**</td>
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<tr>
<td>Italy</td>
<td>-1.82</td>
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<tr>
<td></td>
<td>(0.37)***</td>
<td>(0.34)***</td>
</tr>
<tr>
<td>Females: Market work / Tot work</td>
<td>1.23</td>
<td>4.34</td>
</tr>
<tr>
<td></td>
<td>(2.69)</td>
<td>(3.83)</td>
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<tr>
<td>Males: Market work / tot work</td>
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<td>-0.41</td>
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<tr>
<td></td>
<td>(1.75)</td>
<td>(2.78)</td>
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<tr>
<td>Observations</td>
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<td>24</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.21</td>
<td>0.63</td>
</tr>
</tbody>
</table>

standard errors clustered by countries in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Controls: % Population between 15 and 64 years of age
Figure 1. Gender differences in happiness