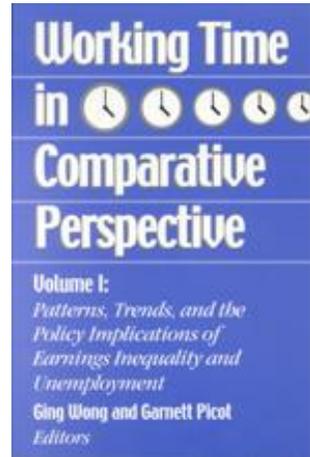

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Hours Constraints

Theory, Evidence, and Policy Implications

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In response to persistent unemployment, particularly in Europe, there have been calls to reduce the length of the workweek in order to share the available work more equally. Implicitly, advocates of these mandated hours reductions believe that the demand for hours of work is inelastic and independent of the number of workers used to fill those hours. Therefore overall employment can be increased by reducing the number of hours that each individual works, a policy often referred to as work sharing. The view that modern workers would actually like to reduce their work hours adds to the attractiveness of this proposal. Juliet Schor's book *The Overworked American* proved enormously popular. Despite stinging criticism from academic economists, the book appeals to professional women, many of whom are in dual-career families and feel caught between the high demands of their jobs and their families.

The Canadian "Report of the Advisory Group on Working Time and the Distribution of Work" (1994) takes a more cautious approach. It suggests that about half of sustained reductions in overtime eventually are translated into new jobs. On the basis of this and other arguments, it recommends reducing the legislated standard workweek to 40 hours in those provinces where the legislated standard exceeds 40. In addition, it recommends giving employees the right to refuse to work more than 40 hours per week. Finally, it recommends allowing a maximum of 100 hours of compensated overtime per year. Additional overtime would have to be offset by reduced hours at other times. In effect, it therefore recommends a legislated maximum average workweek of 42 hours. We note in passing that this would be the maximum

time spent per week on a *single* job. Many people hold more than one job. Such legislation would undoubtedly increase these numbers.

It is relatively easy for economists to dismiss both the calls for mandated hours reductions and Schor's book. In a simple model of hours determination, hours are set optimally. Any interference with the market must reduce welfare. Indeed, it is trivial to produce examples in which reducing the workweek actually reduces employment due to decreased efficiency, suggesting that there even might not be an efficiency/equity trade-off.

Nevertheless, there are deficiencies in this simple economic argument. The models which are used implicitly or explicitly to show that reducing the workweek need not increase employment and therefore may not reduce unemployment are models in which the labor market clears, employment is efficient and there is no unemployment. Having assumed away unemployment, it is difficult to see how we can evaluate programs designed to reduce it. Clearly, more economic analysis is called for.

The recommendation that the workweek should be reduced contrasts with many workers' perceptions that they are underemployed. Most workers do not want to reduce work hours in return for a proportionate pay reduction. The overwhelming evidence from both the United States and Canada is that far more workers would like to *increase* their hours than would like to decrease them, although the European evidence is more mixed. Thus, where some see mandated hours reductions lowering unemployment, others see it exacerbating underemployment.

In this chapter, we do not claim to resolve the issue of whether mandated hours reductions are a viable mechanism for reducing unemployment; our goals are more modest. We consider, both empirically and theoretically, workers' survey responses regarding how many hours they would prefer to work at the same *hourly* rate compared to how much they actually do work. When preferred hours diverge from actual hours, hours are *constrained*.

We have two objectives in examining hours constraints. The first is to assess whether hours constraints are indicative of some sort of problem in the labor market, particularly one of underemployment. The second is to use the information on hours constraints to further our understanding of the functioning of the labor market and determination of working hours.

We conclude that in the United States and Canada, the direction of hours constraints is clear: wanting to work additional hours is more prevalent than wanting to work fewer hours. The evidence is less clear for Europe. The most promising avenue for explaining hours constraints is the development of models of imperfect matching in the labor market, possibly supplemented by issues associated with long-term contracting. We develop a simple example, a model of bilateral search, where although most workers want to work fewer hours, imposing a legally mandated shorter workweek could worsen unemployment and reduce the well-being of workers. Thus we urge caution regarding proposals to promote work sharing by requiring a shorter workweek—the data suggest that more people would prefer to work more hours than fewer hours, and even if people preferred fewer hours, we cannot identify welfare-improving regulation without understanding why both hours constraints and unemployment exist.

THE EXTENT OF HOURS CONSTRAINTS

Survey research on whether people in the United States would like to work more, fewer, or the same number of hours dates back to at least 1966. Since then, five surveys have asked comparable questions regarding desired work hours.¹ Table 1 gives the results of these surveys. All five surveys reveal the same general tendency: more than 40 percent of respondents would like to change their hours of work. Of these, a clear majority want more work not less. Differences in the samples make it difficult to draw strong conclusions about trends.

The Panel Study of Income Dynamics (PSID) also monitored the relation between desired and actual hours through 1987. In the PSID, workers were first asked whether more hours were available on any of their jobs. Those who could not have worked more were then asked if they would have liked to work more. Similarly, they were asked if they could have worked less and, if not, whether they would have liked to work less. One weakness of the PSID is that some salaried workers responded that they could have worked more but, in a subsequent question, revealed that they would not have been paid for the work. Nevertheless, these workers were not asked if they would have liked to have worked more in return for more pay.

Table 1 Selected Survey Results on U.S. Workers' Desire to Work More, Fewer, or the Same Hours (%)

Year	More	Fewer	Same
1966	34	10	56
1978	28	11	61
1985	28	8	65
1991	33	6	62
1995	26	14	55

SOURCE: 1966: George Katona and his associates, sample of household heads (Katona et al. 1971). The exact question was, "Some people would like to work more hours a week, if they could be paid for it. Others would prefer to work fewer hours per week even if they earned less. How do you feel about this?"

1978: Conducted by Louis Harris Associates, sample of employed civilians, aged 17 and over. The question was, "If you had a choice, would you prefer to work the same number of hours and earn the same money, fewer hours at the same rate of pay and earn less money, or more hours at the same rate of pay and earn more money?"

1985: Current Population Survey supplement, sample of employed persons, aged 17 and over (Shank 1986). Question identical to the one above.

1991: International Social Survey Programme. This survey asked, "Think of the number of hours you work and the money you earn in your main job, including regular overtime. If you only had one of these three choices, which of the following would you prefer: work longer hours and earn more money; work the same number of hours and earn the same money; work fewer hours and earn less money?" (Bell and Freeman 1995).

1995: The Gallup Poll, sample of employed persons, aged 18 and over (*USA Today*, April 10, 1995). The exact question was, "If you could, which of the following situations would you choose: fewer hours on the job but less income, the same number of hours and income that you now have, or more hours on the job and more income?"

Despite this weakness, the PSID has the advantage of offering a consistent time series. Moreover, work by Ham (1982) and Altonji and Paxson (1988) shows that the responses to the constraints questions have predictive power for behavior. In addition, Kahn and Lang (1992) show that for wage earners, the PSID questions give results that are similar to those obtained using the questions in the other surveys summarized in Table 1.

Table 2 presents the fractions of PSID respondents who say they would have liked to work more or fewer hours over the period 1968–1987. There may be some bias in time trends in these PSID figures.

The PSID, limited to household heads, follows families through time. While break-off families are added to the sample, there is a risk that part of observed time trends captures changes in household heads over the life cycle. Additionally, in the early years, the low-income population was oversampled. However, over time, regression toward the mean in earnings has led to progressively less oversampling of the low-income population. If these two factors introduce a bias, it should push us toward finding a reduction in the desire to work more, because our work shows that older workers are less likely and poorer workers more likely to want more work.

Table 2 Desire for Different Work Hours (U.S.) 1968–1987 (%)

Year	Men		Women	
	Fewer	More	Fewer	More
1968	6	14	3	13
1969	6	20	6	17
1970	3	20	5	20
1971	6	20	6	21
1972	6	20	6	19
1973	6	20	6	18
1974	5	20	6	24
1975	5	18	5	23
1976	5	20	4	24
1977	9	22	7	18
1978	4	24	7	18
1979	6	22	7	18
1980	5	21	6	20
1981	7	23	5	23
1982	6	26	6	25
1983	7	26	5	23
1984	8	22	6	23
1985	8	22	7	21
1986	6	26	6	21
1987	6	21	6	22

SOURCE: Panel Study of Income Dynamics.

In fact, there is no clear trend in the data. The 1968 numbers are quite different from those of later years. Ignoring this first year of the survey generates a positive correlation between time and both wanting to work more and wanting to work less for women. For men, there is a positive time trend for wanting to work more, but it is significant at only the 0.1 level.

Despite the similarity of these responses to questions intended to measure the same phenomenon, there are other ways of framing the question that generate different answers. A 1978 survey (Best 1981) asked workers what the largest portion of their current yearly income they would be willing to give up for shorter workdays (shorter workweeks, more vacation). The options offered were designed to involve proportional cuts in pay (e.g., “2 percent [$1/50$] of your income for 10 minutes off each workday), although given variation in the length of the workday and number of days worked each year, these may not have been exactly right. Nevertheless, 23 percent said they would take a pay cut for a shorter day, 26 percent for a shorter week, and 42 percent for more vacation. Note, however, that no similar question inquired about possible increases in hours for additional income.

The Canadian Survey of Work Reduction (SWR), conducted in 1986, is particularly helpful for looking at the impact of question wording. While only 17.3 percent of Canadians responded that they would take a pay cut in return for more time off, 26.7 percent were willing to forego some or all of their anticipated pay increase for more time off.²

The Advisory Group on Working Time (1994) reports Benimadhu's (1987) calculations from the SWR that 30.7 percent of Canadian workers preferred fewer working hours while 32.1 percent preferred longer working hours (p. 87). The Advisory Group concludes that “[t]he survey strikingly captures Canadians’ ‘indeterminate’ mood regarding working time . . .” (p. 25).

There are reasons for being skeptical about this conclusion. First, the calculation of people preferring fewer hours included all workers who answered either of the two questions positively (i.e., whether they would be willing to take a pay cut for time off and whether they would be willing to forego part of their pay increase for time off). In contrast, there was only a single question asking whether people preferred to work more hours for more pay (see note 2).

Second, many respondents give contradictory answers to these three different survey questions about hours constraints. In fact, only 12 percent of respondents answer all three questions in a manner consistent with wanting reduced hours.³ Twenty-seven percent, more than twice as many, answer all three questions in a manner consistent with wanting additional work hours.

Third, respondents who “expressed an interest” in working less were asked why they were interested in less work. Almost half rated as “very important” at least one of various responses that are inconsistent with a true preference for less work: giving others a chance for work, avoiding being laid off, starting a business, looking for other work, running an existing business, or working at a second job. In fact, more than one-quarter rated avoiding being laid off as a “very important” reason for wanting to work less, and more than half rated this as at least “somewhat important.” We must therefore exercise extreme caution in interpreting the SWR as revealing a desire for more leisure among a large number of Canadians.

In a similar vein, people who respond that they would like more work might actually want to cut hours at a second job but not work additional total hours. However, so few of these respondents work at a second job that excluding them would not change our estimates of wanting more work.

Given the difficulties of interpreting the responses to the questions regarding the desire for less work, and given the fact that the survey does not inquire why individuals respond that they want to work more, we must be somewhat guarded in our assessment of the results of the survey. Nevertheless, it seems to us that the evidence suggests that Canadians are far more likely to want to work additional hours than to work fewer hours.

This view is reinforced by the results of the 1995 Survey of Work Arrangements (Drolet and Morissette 1997), which asked, “At this job, given the choice, would . . . , at his/her current wage rate, prefer to work: 1) fewer hours for less pay, 2) more hours for more pay, 3) the same hours for the same pay.” The survey found that 27 percent of Canadians preferred, at their current wage rate, more hours for more pay, compared with only 6 percent who preferred fewer hours for less pay. These results are quite close to those obtained for similar questions in the United States.

Similar questions have been asked in other countries. Unfortunately, the results of two major surveys, the first conducted by the International Social Survey Program (ISSP) and the second by the European Union, conflict quite sharply. Table 3 gives the results of the ISSP survey, conducted in 1989. Respondents were asked, "If you had a choice, would you prefer to work: 1) the same number of hours and earn the same money, 2) fewer hours at the same rate of pay and earn less money, or 3) more hours at the same rate of pay and earn more money?"

In Table 3, the United States looks similar to other OECD countries. It has a relatively high fraction of workers who want to work more, but this proportion is not substantially higher than in Ireland and Italy. Similarly, relatively few people in the United States want to work less, but that is true of most other OECD countries. In every country more people want to work more than less, although the difference is not large in Germany.

Table 4 gives responses to the European Union survey, also conducted in 1989. The survey asked, "Assuming that your hourly rate remained unchanged, would you like to work less, as long, or longer?" While this question does not appear to be significantly different from the question used by the ISSP, the survey results are dramatically different. A large minority of workers in all countries reply that they would like to work less. In all the European Union countries, the fraction wanting less work is significantly higher than the fraction wanting more.

Table 3 Desire for Different Work Hours in Various Countries

Country	More	Fewer	Same
Austria	23	8	68
Germany	14	10	76
Ireland	30	5	65
Italy	31	7	62
Netherlands	18	12	70
Northern Ireland	27	6	68
Norway	24	7	69
United Kingdom	24	8	68
United States	33	6	62

SOURCE: Bell and Freeman (1995).

Table 4 Desire for Different Work Hours in European Union

Country	More	Less	Same	Part-time, want full-time
Belgium	7	28	43	2
Denmark	9	29	61	1
France	9	39	52	10
Germany	4	38	55	1
Greece	15	28	57	11
Ireland	11	18	65	–
Italy	8	39	50	16
Netherlands	8	31	56	2
Portugal	2	49	46	10
Spain	12	42	44	15
United Kingdom	12	33	50	2

SOURCE: Commission of the European Communities (1991, Tables 22, 23).

The first three columns give responses to the question, “Assuming that your hourly rate remained unchanged, would you like to work less, as long, or longer?”

The last column gives the percentage of all workers who are *both* part-time and answer “yes” in response to the question, “Would you rather have full-time employment?”

We note some other results in the European Union survey that make the results in Table 4 even more surprising. The survey also asked part-time workers whether they would prefer full-time work; results are given in the last column of Table 4. In France, Italy, Portugal, and Spain, more people are part-time and want full-time work than say that they would prefer to work more. While this is technically feasible (e.g., if part-timers respond that they want full-time work because full-time work is compensated at a higher hourly rate than part-time work), the counterintuitive result is concerning.

Another surprising aspect of the European Union study is the difference between answers to the question about wanting more or fewer hours of work at their present hourly rate and answers to a question regarding willingness to trade pay raises for shorter hours. The correlation across countries of the percentage wanting fewer hours in the two questions is only 0.05, although the average across countries is not very dissimilar (34 percent versus 30 percent).

While there is no formal contradiction among the different answers to the different questions, we find these differences disturbing. However, the high number of Europeans desiring shorter hours in the European Union survey seems corroborated by the British Household Panel Survey (BHPS) of 1991, which asked, "Thinking about the hours you work, assuming that you would earn the same amount per hour as at present, would you prefer to: work *fewer* hours than you do now; work *more* hours than you do now; or carry on working the *same number* of hours?" Among male employees age 21–64, 36 percent respond fewer, 7 percent more, and 56 percent the same (Stewart and Swaffield 1995). These results are quite similar to the European Union survey. We find the face validity of the BHPS to be the greatest of the three surveys, because it seems to make it clear that the hourly rate would be unchanged. The contradictions within the European Union survey and between the European Union and ISSP surveys remain a matter of concern.

Finally we note that older European surveys indicated that wanting more work is more common than wanting less work. Katona et al. (1971) report the answers to the question, "Some people would like to work more hours per week if they could be paid for it. Others would prefer to work fewer hours per week even if they earned less. How do you feel about this?" In all four European countries surveyed (United Kingdom, Germany, Netherlands, and France), wanting to work more was substantially more common than wanting to work less.

In part because of the importance of phrasing, economists are inclined to be skeptical of answers to hypothetical questions such as those used in all of these survey questions on preferred hours. Unfortunately, there is only limited experience in North America with organizations allowing workers to voluntarily reduce work effort in return for a pay reduction. Nevertheless, it does not support the finding that a large fraction of the population would give up income for more vacation. Best (1981) reports that Santa Clara County, California, faced with severe budget cutbacks in 1976, offered workers the option of a 5, 10, or 20 percent pay reduction in return for an increase of 10.5, 21, or 42 days of vacation. We note that, given the existence of holidays and fixed fringe benefits, this is somewhat more favorable to workers than a proportionate reduction in compensation. Seventeen percent of workers increased their vacation. Best also reports that about 16 percent of

lawyers in the public defender's office take a three-month sabbatical each year in return for a 25 percent salary reduction. Because interest in less work is more common among higher earning workers in both U.S. and Canadian surveys, these experiences do not suggest a large latent demand for reduced work hours.

Perhaps the most extensive test was in New York state government, which in 1984 adopted a system of voluntary reduction in work schedules, or V-time. This offered full-time employees the opportunity to reduce their work schedules and salaries by 5–30 percent while remaining in their career-path positions. Leave time and pensions were prorated. Subject to their supervisors' approval, employees could reduce their workday or workweek on a regular basis, take time off intermittently, or "bank" time for use at a later date. The official program guidelines did not specify any "acceptable reasons" for requesting V-time, nor did the application even ask for reasons. V-time was not a once-and-forever choice. Workers could request a V-time arrangement to last for as long or short a period as they wished. Many employees were eligible for V-time, including professional, scientific, technical, managerial, and "confidential" employees.

From the perspective of trying to discover a latent demand for reduced working hours, the program could hardly have been more ideal. Its extreme flexibility gave employees themselves the choice of the timing and duration of cutbacks. Nevertheless, very few people actually requested V-time. The number of participants never represented more than 2 percent of employees in the jobs covered by the program. The most common uses of V-time were for temporary maternity and family leaves. As of October 1993, there were only 588 V-time participants, less than 1 percent of the eligible employees.

THEORIES OF HOURS CONSTRAINTS

There is relatively little information on the actual number of hours that individuals wish to work. Based on Kahn and Lang (1995), the average Canadian would like to work 8 percent more hours, comparable in magnitude to the loss in work time due to unemployment. Understanding hours constraints is therefore potentially extremely

important. Below we summarize four primary theories in the literature that may explain why workers are constrained to work more or less than they desire.

Long-Term Contracting

Lazear (1979, 1981) has argued that long-term contracts lead to a divergence between the wage and the value of marginal product (VMP). This leads to a conflict between the hours that would be chosen by the worker and firm. Workers will wish to work until the marginal value of leisure equals the wage. Firms will want workers to work until their value of marginal product for the last hour worked equals the wage. Efficiency requires that hours be set so that the marginal value of leisure equals the value of marginal product for the last hour worked. If the value of marginal product from an hour worked is independent of hours worked, it follows that whenever the wage exceeds VMP, workers will be constrained to work less than they want. Conversely, when VMP exceeds the wage, workers will be constrained to work more than they want.

Lazear develops his argument in the context of an agency model. In this model, workers post a bond, in the form of a low starting wage, that is later returned to senior workers in the form of wages that exceed their VMP. Thus, in the agency model, junior workers should be constrained to work more than they wish while senior workers should be constrained to work less than they wish.

In contrast, in many specific-capital models (Becker 1975), workers and firms invest jointly so that junior workers are paid more than their VMP. The firm recoups its investment by paying senior workers less than their VMP. Thus, in the specific-capital model, junior workers are constrained to work less than they wish while senior workers are constrained to work more. Kahn and Lang (1992, 1995) discuss hours constraints in the agency and specific-capital models more fully.

Other long-term contracting models also imply hours constraints. For example, in Harris and Holmstrom (1982), firms and workers are uncertain about how productive the worker will turn out to be. Firms offer insurance contracts in which they promise not to reduce wages. Information about productivity is revealed gradually to the market. Workers who turn out to be unproductive end up being overpaid, while

the wages of more productive workers are bid up. As with other long-term contracting models, this can be shown to imply hours constraints. On average, low-seniority workers are paid less than their VMP, because firms are collecting insurance premiums. However, on average high-seniority workers are paid more than their VMP, because firms have stopped collecting insurance premiums and are making insurance payments to low-productivity workers. Consequently, on average more senior workers will be constrained to work less than they wish.⁴ Thus, in both the Harris/Holmstrom and agency models, the tendency to want additional hours rises with seniority.

Hedonic Models of the Wage/Hours Locus

For most people, going to work involves substantial fixed costs. Regardless of how long the individual remains at work, she or he incurs the cost of commuting. Once at work, there may also be set-up costs—for example, the time it takes to boot the computer. Therefore, it is no surprise that we observe few workers who are employed for extremely short time periods, because workers would demand a high hourly wage while firms would only be willing to offer a very low one. At the other end of the spectrum, workers who worked very long hours would suffer from fatigue. The workers would require high wages to compensate them for working such long hours, but firms would be unwilling to pay high wages to such workers because their productivity would be low.

More generally, if we were to plot the average hourly wage workers would require to compensate them for different weekly hours of work (i.e., their indifference curves in wage/work-hours space), we would expect the indifference curves to be U-shaped with moderate hours of work requiring less average hourly compensation than very short or very long workweeks. In contrast, if we were to plot the average hourly pay firms would be willing to pay for different weekly hours of work (i.e., their iso-profit curves in wage/hours space), we would expect them to be hump-shaped with moderate hours of work more compatible with higher average hourly wages than either very long or very short workweeks.

If all workers and all firms are identical and there is free entry, equilibrium is at the point of tangency between the indifference curves

and the zero-profit iso-profit curve. This point is efficient. Given the options available, no worker or firm wants to change hours.

When workers and firms are heterogeneous, the tangencies of the indifference and iso-profit curves will trace out a hedonic wage/hours locus. Workers who want short hours will be matched with jobs in which short hours are relatively advantageous to the firm. The shape of the wage/hours locus is largely indeterminate. It may be linear, hump-shaped, U-shaped, or wiggly. Regardless of the shape, each firm offers a job with the most profitable wage/hours combination given this locus. Each worker chooses his or her most preferred job given the same wage/hours locus. Again, the equilibrium is efficient, and no worker or firm wants to change hours.

The survey questions described in the previous section typically do not ask workers whether they would prefer to move to a different spot along the wage/hours locus. Instead they ask if workers would like to change hours if they could work at the same hourly rate. Because workers may not have the option of working a different number of hours at the same hourly rate in the hedonic model, they may well prefer to change hours if given this option.

In order to know whether workers will want more or fewer hours at their usual hourly wage, we need to examine the relation between their marginal wage and their average hourly wage. Workers choose to work up to the point at which the marginal wage is equal to their marginal value of leisure. If the average wage exceeds the marginal wage, it will therefore also exceed the marginal value of leisure, and they will desire additional work at that wage. On the other hand, if the marginal wage exceeds the average wage, the average wage will be less than the marginal value of leisure, and workers will prefer to reduce their hours if they can do so at their average hourly wage.

Whenever the average hourly wage is greater than the marginal wage, the hourly wage will be declining with hours worked. Conversely, if the average hourly wage is less than the marginal wage, the hourly wage will increase with hours worked. Therefore, the hedonic model predicts that workers will want more hours if they are on an increasing section of the wage/hours locus and fewer hours if they are on a decreasing section.

Models with Rigid Wages

Hours constraints may arise when workers and firms sign fixed-wage contracts that allow firms to set hours. While fixed-wage contracts are commonly seen empirically, they lack a theoretical foundation. Although insurance-based models would seem the logical theoretical underpinning for fixed-wage contracts, these models suggest that salary, not wages, should be fixed. Similarly, efficiency wage models imply efficiently set wages rather than fixed ones.

Despite its theoretical deficiencies, a fixed-wage model is attractive because it suggests that hours constraints can be viewed as a continuum where hours fall as demand falls, and unemployment is but an extreme. Without a formal theoretical model, it is impossible to make firm statements as to the predictions that follow from this view of hours constraints. Nevertheless, we would expect that in such a model, the desire to work less would be positively correlated and the desire to work more negatively correlated with measures of excess demand in the labor market.

Hours as a Screening Device

Rebitzer and Taylor (1996) develop an explanation of why there might be a shortage of short-hour jobs in certain occupations. The motivation for their model is law associates. Rebitzer and Taylor argue that requiring long hours is a screening device for individuals with low disutility of effort. Because potential partners care about being part of a firm with hard-working partners and because partner effort is difficult to monitor, law firms benefit from requiring that associates work long hours. Provided that disutility of effort and disutility of hours on the job are correlated, reducing hours may create an adverse selection problem by attracting less hard-working individuals to the firm.

EVIDENCE FOR AND AGAINST THE THEORIES

Long-Term Contracts

Kahn and Lang (1992, 1995) report that in both the PSID and the Canadian SWR, wanting to work additional hours is negatively related to seniority. Table 5 presents some representative results from the Canadian data. Almost half the most junior workers want *more* work, compared with roughly 20 percent of the most senior workers. In contrast, only about 10 percent of the most junior workers but twice as many senior workers want to work less. The relation between seniority and the constraints favors models such as firm-specific capital, in which wages grow less rapidly than VMP. On the other hand, at no seniority level does the average worker want less work or does the number of workers wanting less work exceed the number wanting more. This suggests that long-term contracting cannot be the sole explanation for hours constraints. If it were, the results would imply that wages exceed VMP at all seniority levels which is inconsistent with profit maximization.

The Hedonic Model

The distribution of actual hours appears to be responsive to desired hours, suggesting that matching takes place in the labor market as predicted by a hedonic model. Kahn and Lang (1995) report that in Canada, usual hours worked increase by half an hour for every hour increase in desired hours. This is true both for individuals and for mean usual and desired hours across provinces. In the European Union survey, among 11 countries, the fraction of workers wanting to work more than 45 hours is correlated with the fraction actually working more than 45 hours ($r = 0.42$) and even more so if we exclude Portugal ($r = 0.80$). The correlation between the fraction wanting to work less than 20 hours and those working less than 20 hours is even greater ($r = 0.94$, including Portugal).

On the other hand, the matching seems to be only imperfect inasmuch as it improves over time. In the Canadian results reported in the first part of Table 5, the fraction of workers who do not want to change their work hours rises from 43 percent among the lowest tenure group

Table 5 Proportion of Workers Experiencing Binding Hours Constraints by Job Tenure and Short/Overtime (Canada)^a

Job tenure (months)	More work	Less work	Satisfied with hours	<i>N</i>	Number of hours ^b
1–3	47.9	9.2	42.9	740	5.45
4–6	46.5	11.3	42.2	360	5.30
7–9	41.5	12.2	46.3	200	4.66
10–12	41.9	17.9	40.2	259	4.00
13–24	36.6	15.9	47.4	660	3.24
25–36	35.8	18.0	46.5	435	3.28
37–48	37.5	16.9	45.5	446	3.18
49–60	35.0	18.9	46.0	472	2.98
61–120	34.9	17.7	47.4	1598	2.80
121–240	25.9	20.8	53.3	1500	1.60
> 240	22.0	20.2	57.9	574	1.21
Short/overtime					
On short-time	37.4	27.0	35.6	97	4.60
Normal hours	33.4	17.3	49.3	6167	2.88
More than usual	39.1	16.9	44.1	980	3.17
All	34.2	17.3	48.5	7244	2.94

SOURCE: Kahn and Lang (1995).

^a Based on the Survey of Work Reduction supplement to the Canadian Labour Force Survey, June 1986.

^b “Number of hours” is the average number of additional hours desired by members of the group. All observations are weighted by their sampling weight.

to 58 percent among the highest tenure group. This suggests that either workers adjust their tastes over time or that dissatisfied workers leave for jobs with hours requirements that conform better to their tastes. Using the PSID, Altonji and Paxson (1988) find that U.S. workers’ responses regarding desired hours help predict whether workers will subsequently shift to longer or shorter hour jobs.

Additional evidence suggesting only imperfect hedonic matching is found in the fact that substantial fractions of part-time workers would prefer full-time work, and vice versa. One likely interpretation

of these statements is that these people would prefer to be at a different point along the wage/hours locus but cannot. Thus, although the hedonic model may give insight into how hours and wages are determined, the empirical evidence suggests that there is substantial mismatching.

To test the hedonic model more formally, Kahn and Lang (1996) use the June 1986 Canadian SWR to estimate the wage/hours locus and an hours-constraints equation simultaneously. We test whether the pattern of hours constraints conforms to the hours constraints that should be generated by the wage/hours locus under the hedonic model. A pure hedonic model is easily rejected. We do not find that workers wanting more hours are in the downward-sloping part of the wage/hours locus and those wanting fewer are in the upward-sloping part.

However, when hours constraints are allowed to depend on seniority (as in the firm-specific model) as well as on the slope of the wage/hours locus (as in the hedonic model), the empirical model fits surprisingly well. Kahn and Lang (1996) plot the actual wage/hours locus estimated from income and hours data and the wage/hours locus predicted on the basis of hours constraints and seniority. The curves are quite similar except in the region beyond 60 hours, and the poor fit in this region is due to the fact that average weekly earnings actually fall beyond 58 hours. Excluding these long-hour workers, who tend to be low-tenure workers in managerial or administrative positions who are presumably investing in their career, the equality of the two equations cannot be rejected.

Thus, we cannot reject a model of hedonic matching combined with long-term contracting due to firm-specific skills.⁵ This is somewhat surprising in light of the evidence of imperfect matching cited above. It is also difficult to reconcile the sharp spike in the distribution of hours with the pure hedonic model. To some extent, the failure to reject the hedonic model must reflect relatively inefficient statistical techniques forced on us by the imperfect data.

Models with Rigid Wages

Hours constraints are correlated only weakly if at all with measures of labor demand. Because the Canadian data are cross-sectional, we measure variation in labor demand two ways. First, we utilize the

fact that workers who respond that they are on short-time (reduced hours) will tend to be in firms and/or industries experiencing unusually low demand, while workers who are working more than their usual hours will tend to be in firms and/or industries experiencing unusually high demand. The bottom panel of Table 5 shows the hours constraints for 1) workers working less than usual because of short-time,⁶ 2) workers working their normal hours, and 3) workers working more than their usual hours. The desire to work fewer hours is most common among workers on short-time. Similarly, the desire to work more hours is most common among those working more than their usual hours. The results suggest that when the establishment faces low demand, workers who want to work fewer hours take advantage of the situation to reduce their hours. Similarly, when the establishment needs additional hours, workers who want more hours are able to increase their hours. Thus, hours constraints cannot be interpreted as cyclical underemployment being imposed on unwilling workers.

We also capture labor demand from the cross-sectional Canadian data through regional unemployment rates. Here, too, the relation is weak. Among Canadian provinces, there is a positive relation between average additional hours of work desired and the unemployment rate, but it falls well short of conventional significance levels (Kahn and Lang 1995). Similarly, in the U.S. PSID data, controlling for other factors, the local unemployment rate is positively related to the desire for more work, but the coefficient is generally insignificant (Kahn and Lang 1992).

Using time-series data from the PSID in Table 2, there is some evidence of a relation between the prevalence of hours constraints and the national unemployment rate. The proportions of both men and women wanting to work more are each positively correlated with the civilian unemployment rate for men age 20 and over, although this result is not robust to including a time trend in the case of women. On the other hand, the proportion wanting to work less is not significantly related to the unemployment rate, and the correlation is positive.

Hours constraints, however, are related to recent personal unemployment experience in both Canada and the United States, even controlling for experience and seniority (Kahn and Lang 1992, 1995). One explanation for this result is that workers who obtained their jobs after an unemployment spell are less well matched than those who "chose"

new jobs and experienced no intervening unemployment. A second explanation could be that people tend to want long hours after an unemployment spell because they have run down their assets, but that mismatching makes it unlikely that they actually obtain these long hours.

Hours as a Screening Device

The Rebitzer and Taylor (1996) screening model predicts only overemployment, rather than both overemployment and underemployment. It thus cannot explain the desire to work additional work hours that is so common in the United States and Canada. Rebitzer and Taylor found their theory to have explanatory power for lawyers. It may apply as well to other similar occupations. In both Canada and the United States, people who desire to work fewer hours tend to be higher-earning workers, i.e., more educated, in more skilled occupations, etc. (Kahn and Lang 1991; Drolet and Morissette 1997). These may indeed be the occupations where hours are a signal of effort.

HOURS CONSTRAINTS, THE DISTRIBUTION OF HOURS, AND UNEMPLOYMENT

In sum, it appears to us that hours constraints are best understood in the context of a matching model in which wages do depend on hours as in hedonic models, but in which the matching is imperfect. (There may also be long-term contracting.) An imperfect matching model would also allow us to evaluate hours policies in the context of a model in which unemployment as well as vacancies can arise. In this section, we take some tentative steps toward analyzing the impact of mandated hours reductions in the context of such a model. The model we use is a simple extension of the Butters (1977) equilibrium search model. We describe it only informally.

In labor market variants of the model (Hosios 1986; Lang 1991), each firm decides simultaneously whether or not to make an offer to a worker and, if so, what wage to offer. Making an offer entails paying a fixed cost. Under certain circumstances this may be interpreted as the

cost of renting a machine prior to trying to hire a worker. The worker chooses the firm that offers him or her the highest wage. Because some workers may get only one offer and others may get multiple offers, the equilibrium involves a wage distribution. Each firm recognizes that offering a higher wage raises the probability of hiring the worker but lowers profits conditional on getting the worker. Because some workers randomly fail to receive any offers, there is unemployment. Similarly, some firms' offers are turned down, resulting in vacancies.

To take account of hours constraints, we extend the model in a simple way. First, we assume that firms make tied wage/hours offers. The worker chooses the firm offering the highest utility level provided that utility level exceeds some reservation utility level. For simplicity, we assume that the value of marginal product per hour v is independent of hours worked and that the utility function is given by $u = \log(wh) + (T - h)/\beta$ where wh is (labor) income, h is hours worked and $(T - h)$ is leisure. This utility function has the property that desired work hours equal β and are independent of the wage rate.

We note that the resulting equilibrium is very much a theoretical counterpart to Dickens and Lundberg's (1993) study of constrained labor supply in that workers choose from a limited and stochastic number of wage/hours offers. In contrast with that paper, we allow for unemployment.⁶

The firm chooses w and h to maximize expected profits which are given by

$$(1) E(\pi) = P(u) (v - w) h - d,$$

where u is the utility associated with the offer, P is the probability of the offer being accepted, and d is the fixed cost of making an offer. The equilibrium is characterized by a distribution of wages and hours, and of utilities with corresponding values of P .

It is relatively straightforward to prove the following:⁷

- 1) All firms offer hours in excess of β . In other words, all workers would respond that they would want to work less at their usual hourly wage.
- 2) There is a distribution of hours and wages. The hourly wage is monotonically declining in hours. In fact, wh is constant.

If we were to observe the facts 1 and 2 without the perspective of the model, the logic for mandating hours restrictions would seem compelling. The atheoretical perspective would be as follows. Workers want shorter hours. If hours could be reduced but salaries maintained (i.e., *wh* constant), this even suggests that firms are equally happy with both situations. Moreover, the quantity of labor demanded would rise, thereby reducing unemployment. Thus mandating a shorter workweek to reduce unemployment would appear to be a “sure-fire winner.”

Unfortunately, within the context of the model, that policy assessment turns out to be completely wrong. Again, it can be shown [see Appendix] that:

- 1) mandating lower hours increases unemployment,
- 2) mandating lower hours decreases wages, and
- 3) mandating lower hours is welfare deteriorating in the sense of Pareto.

Thus, in contrast to the conclusion we might be tempted to draw, mandated hours restrictions will not be desirable. The Appendix works out a numerical example that illustrates these results.

Our choice of utility function and production function were designed to generate an equilibrium in which workers express a desire to work fewer hours. We chose this example because we believe that this equilibrium would appear to provide a strong *a priori* case for mandated hours restrictions when examined atheoretically. It is easy to choose utility and production functions such that workers desire to work more hours at their usual hourly wage.

At the cost of some complexity, Lang and Majumdar (2000) extend this model to allow for heterogeneous preferences and thus for imperfect matching. Because each worker chooses from only a limited number of jobs, matching is imperfect. Nevertheless, workers preferring low-hours jobs tend to end up in jobs with low hours since they take these jobs whenever a choice is available. They find that hours restrictions can increase or decrease unemployment. The principal welfare effect is distributional. Workers who prefer jobs with short hours are better off while those who prefer longer hours are worse off.

IMPLICATIONS FOR MANDATED HOURS RESTRICTIONS

Neither the empirical nor the theoretical case for mandating hours restrictions to increase work sharing and reduce unemployment is compelling. In the United States and Canada, there is very little evidence that workers are interested in accepting less pay in return for more leisure. The situation in Europe may be different.

In the introduction to this chapter, we argued that we cannot evaluate theoretically a policy designed to lower unemployment within the context of a model which assumes away unemployment. Neither the long-term contracting nor the hedonic matching model predicts any unemployment, while “models” of rigid wages have no theoretical underpinnings with which to evaluate policy. However, the imperfect matching model sketched in the previous section predicts both hours constraints and unemployment. We have established that such models do not justify casual support for mandated hours restrictions. Indeed, our simple model suggests that they may be welfare-deteriorating and lead to wage losses and even more unemployment. However, mandated hours restrictions may be welfare-improving in some situations such as law firms where hours serve as a screening device.

Moreover, any attempt to legislate a reduced workweek and promote work-sharing will undoubtedly increase the pervasiveness of dual job-holding, at least within the United States and Canada. Whatever theoretical model is assumed, there is also likely to be a change in the wages paid for jobs with different levels of required hours. Any analysis of the effect of mandated hours restrictions must take these effects into account.

Notes

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1. We exclude proprietary surveys for which basic information on question wording and sample design are not available and surveys with questions that do not explicitly suggest an earnings/hours trade-off. A 1993 Gallup Poll asked workers their actual and desired hours. Mean actual hours were reported as 42.5 while desired

hours were 36.7. However, 16 percent of workers responded that they preferred zero hours, suggesting that these respondents were not thinking of an hours/salary trade-off. Excluding this 16 percent of respondents, mean desired hours was 43.7.

2. The exact questions asked were

- “In the next two years, would you take a cut in pay if you received more time off in return?” Follow-up if no: “Why not?” Follow-up if yes: “What percent of your pay would you give up to have more time off?” Accompanying these questions was a table and examples to help the respondent think about how much money an x percent pay cut represents, and how much time an x percent hours cut represents.
- “Another way to gain more time off is to trade all or some part of your pay increase. Would you trade some of your increase in the next two years for more time off? For example, gain 5 percent more time off instead of a 5 percent pay raise?” Follow-up if yes: “How much of your increase in the next two years would you take as time off?”

The questionnaire proceeded with a set of questions on how the person would prefer to reduce work time (e.g., fewer hours per day) and about reasons that person preferred to work less. The questionnaire then continued with:

- “If you continue to be paid at the same rate of pay that you are now, would you work more hours for more pay?” Follow-up if yes: “How many more hours per week would you want to work?”
3. Many people gave inconsistent answers. For instance, almost one-quarter of those who said they were willing to take a pay cut for fewer hours also said they were not willing to forego pay increases for fewer hours, and half of these actually said they would like to work more hours for more pay.
4. Strictly speaking, only workers in the final work period have stopped paying insurance premiums and only in this period are high productivity workers paid exactly their marginal product. In other years, they are underpaid because of insurance premiums.

Allowing mobility reinforces the tendency for more senior workers on average to be paid more than their marginal product and hence to prefer more work hours. Workers revealed to be high productivity will be indifferent among all firms while workers revealed to be overpaid will prefer employment at their present employer. Consequently, highly productive workers are more likely to change jobs than are overpaid workers, further adding to the average overpayment of senior workers.

5. The fact noted earlier that seniority decreases the desire to work more hours is also consistent with the firm-specific capital model.
6. Dickens and Lundberg (1993) is primarily an empirical paper, but it incorporates a structural model. Because their data set included only employed people, they did not model unemployment.
7. Differentiate Eq. 1 with respect to both w and h . Dividing one first-order condition by the other and rearranging terms gives $w = \beta v/h$. Since firms can only make profits if $w < v$, this requires that $h > \beta$. Moreover, it implies that $wh = \beta v$, a constant.

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Appendix

Consider a worker who obtained utility U_0 in the unconstrained equilibrium. The firm chooses the profit-maximizing combination of wage/hours for that U_0 . Let $\pi_a = (v - w)h - d$ be the profit obtained conditional on hiring a worker achieving U_0 . (Recall that the probability of the offer being accepted P is dependent only on U .) When hours are constrained, if the firm were still to hire a worker who received U_0 , the new profit must be lower than the unconstrained profit.

The zero profit condition requires that $P(v - w) = d$. Therefore, when hours are constrained, $\pi_c \leq \pi_a$ implies that $P_c(U_0) \geq P_a(U_0)$. For this to be true, the likelihood of a worker obtaining utility greater than U_0 must be lower (or equal) when hours are constrained than when they are not.

Hence, workers are worse off (or, more formally, no better off) in the constrained equilibrium. This argument applies to all utility levels, including the reservation utility, the lowest utility offered. If the likelihood that a worker who is offered the reservation utility accepts the offer is greater in the constrained solution, then the likelihood of a worker receiving a utility greater than this minimum reservation level is lower; so we will see higher unemployment rates.

It may also be helpful to work through a numerical example. Suppose that β equals 40 (so that workers' desired hours equal 40 as well), v equals 10, and d equals 20. We set the reservation utility so that in equilibrium the maximum number of hours in any offer is 60. The following can be derived: All workers are offered an income of 400. Hours offers range from 42 to 60; wage offers range from 6.67 to 9.52. The unemployment rate is 10 percent. When hours are set exogenously at 42, wage offers range from about 6.07 to about 9.52. The unemployment rate is about 12 percent. In a standard competitive model with this same utility function and $v = 10$, a profit-maximizing firm sets hours = 42. Imposing the "competitive solution" dramatically lowers employment and wages.

Part IV

Working Time in Comparative Perspective

Volume I

Patterns, Trends, and the Policy Implications for Earnings Inequality and Unemployment

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and
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