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Joseph G. Altonji
Emiko Usui

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ABSTRACT

Using the Panel Study of Income Dynamics and the Health and Retirement Study, we provide a set of facts about vacation leave and its relationship to hours worked, hours constraints, wage rates, worker characteristics, spouse's vacation leave, labor market experience, job tenure, occupation, industry, and labor market conditions. We show that on average vacation time taken rises 1 to 1 with paid vacation but varies around it, that annual hours worked fall by about 1 full time week with every week of paid vacation, that the gap between time taken and time paid for is higher for women, union members, and government workers, that hourly wage rates have a strong positive relationship with paid vacation weeks both in the cross section and across jobs, and that nonwage compensation is positively related to vacation weeks. We provide evidence that vacation leave is determined by broad employer policy rather than by negotiation between the worker and firm. In particular, it is strongly related to job seniority but depends very little on labor market experience, and for job changers it is only weakly related to the amount of vacation on the previous job.

Joseph G. Altonji
Yale University
Department of Economics
PO Box 208269
New Haven, CT 06520-8269
and NBER
joseph.altonji@yale.edu

Emiko Usui
Department of Economics
Wayne State University
656 W. Kirby Street
2127 FAB
Detroit, MI 48202
usui@wayne.edu

1. Introduction

Empirical research on work hours is dominated by the massive labor supply literature, which assumes that people can choose hours at a parametric wage.[1] However, casual empiricism suggests that firms have strong preferences about employee hours, and there is a good basis in theory for believing this to be the case. The models of Ehrenberg (1971), Lewis (1969), Rosen (1968, 1969), and Deardorff and Stafford (1976) emphasize the effect of startup costs, fatigue, and hiring and training costs that are fixed per employee in shaping the hours preferences of firms. They also consider nonlinearities in compensation that are induced by fringe benefits, payroll taxes, and overtime pay as well as the costs of coordinating workers who work different hours. Rebitzer and Taylor (1995), Landers et al. (1996) and Sousa-Poza and Ziegler (2003) provide a different class of models in which firms regulate hours because hours requirements influence the quality of a firm's workforce.[2]

There is also substantial evidence that the hours choices of workers are in fact constrained by the employer. For example, Altonji and Paxson (1986) and recent studies by Martinez-Granado (2005) and Senesky (2004) show that the variances of changes in hours per week, weeks per year, and annual hours worked are much larger across jobs than within the job. This evidence suggests that work time is to an important extent a job specific phenomenon.[3] Studies of the labor market for older

[1] See Killingsworth (1983), Pencavel (1986) and Blundell and MaCurdy (1999) for comprehensive surveys. Cogan (1981), Hanoch (1980) and subsequent studies have modified the basic framework to accommodate fixed costs, so that worker preferences and budget parameters influence the form in which work hours are packaged. Rosen (1976), Biddle and Zarkin (1989), and Moffitt (1984) are early examples of labor supply studies in which workers choose hours and wages according to a market locus.

[2] Their basic assumptions are that (1) work preferences are heterogeneous and unobserved by the firm and are either correlated with skill or directly influence productivity affecting current and future effort levels or turnover decisions and that (2) pay cannot be tied directly to the productivity of a worker. The difficulty in matching pay to productivity may arise because productivity is unobservable or because of problems in devising and enforcing multi-period contracts, particularly when turnover is a key issue. This will lead to reluctance on the part of highly productive workers who happen to have strong leisure preferences to bargain for more vacation time. As a result, vacations will tend to be set by firm wide policy rather than tailored to individuals. Too little vacation may be offered out of a fear of attracting less productive workers.

[3] The results of Altonji and Paxson (1986, 1992) as well as a substantial literature using self reported measures of unemployment, underemployment, and overemployment (eg. Ham (1982, 1986), Kahn and Lang (1992, 1995), and Altonji and Paxson (1988) suggest that workers face demand constraints that they cannot fully avoid by changing jobs. Research by Paxson and Sicherman (1996) on dual job holding suggests that second jobs are sometimes used to adjust hours on the margin despite the fact that they pay less per hour basis than full time jobs. Note that we abstract from preferences of firms and workers regarding the timing of work over the day and the week. See Hamermesh (1996, 1998, 1999) for evidence.

workers have stressed restrictions on going part time with one's current employer as well as a large wage penalty associated with giving up a full time job for part time work in another firm (e.g., Gustman and Steinmeier (1983, 1984), Berkovec and Stern (1991), Hurd (1996), Elder (2004) and Aaronson and French (2004)).[4] In summary, restrictions on choice of hours in a given job appear to be a key feature of the labor market.

Firms regulate days of work by establishing fixed holidays, paid and unpaid vacation and personal days (hereafter, vacation days) and provisions for excused absences due to illness or family considerations, perhaps with pay. Strictly from a budget point of view, there is no meaningful economic distinction between "paid" and unpaid vacation. One can always adjust the wage rate paid for time worked to achieve a given level of annual compensation for a given amount of time worked over the year. However, adjusting time off without leaving an employment relationship involves authorized leave.[5] Indeed, a number of countries, particularly in Europe, regulate work time by requiring employers to provide a minimum number of paid vacation days. Consequently, data on paid vacation days and other forms of regular leave provide a direct measure of the work requirements imposed on the worker by the firm or by law. Leave policy is of interest in its own right and as a window on how hours are determined in the labor market. Analyzing it may help inform the contentious debate over whether Americans work more than the optimal amount given preferences and productivity, as is implied by some of the adverse selection models of hours determination mentioned above.[6] Since little is known about this important job characteristic, we fill the gap by providing a set of facts about vacation leave and its relationship to hours worked, hours constraints, wage rates, worker characteristics, labor market experience and job tenure, occupation, industry and labor market conditions.

Specifically, we use the Panel Study of Income Dynamics (PSID), and other sources, including the Health and Retirement Study (HRS) to address the following questions about vacation leave.

1. What are the distributions of weeks of paid vacation received and vacation weeks actually taken, and how do they relate? In particular, what is the effect of weeks of paid vacation on weeks actually taken?

[4] Blank (1990a, 1990b) considers selection bias issues and concludes that there is a substantial premium to working full time in many but not all types of jobs. Aaronson and French (2004) provide fairly compelling evidence for a substantial full time premium.
[5] Both firms and individuals also care about the daily work schedule. See Hamermesh (1999) for analysis of the distribution of work hours by time of day and days of the week.
[6] See Altonji and Oldham (2003) for a brief discussion of theoretical arguments for vacation laws. See Schor (1991), Kniesner (1993) and Stafford (1992) for conflicting view on trends in hours in the U.S.

2. How are weeks worked per year, hours per week, hours per year on the main job, and annual hours on other jobs influenced by weeks of paid vacation and weeks actually taken? Do workers offset vacation on the main job by working longer hours?
3. How are personal characteristics that influence wages and hours preference related to vacation time? Is vacation time taken influenced by the amount of paid vacation time received by a spouse, conditional on one's own paid vacation time?
4. How do hourly wage rates and weeks of paid vacation relate?
5. How does vacation time vary with labor market experience and seniority?
6. Does vacation time on a previous job influence vacation time on subsequent jobs? We use this question to provide indirect evidence on the issue of whether workers negotiate over vacation time when taking new jobs.
7. How do weeks of paid vacation and weeks actually taken vary with job characteristics such as union membership, government employment, occupation, and industry? Do they depend on percent female in an occupation? Has the relationship between percent female and vacation time weakened over time?
8. Is vacation time countercyclical, as predicted by some equilibrium business cycle models?

The paper continues in Section 2, with a brief discussion of economic content of paid and unpaid vacation leave policy. In Section 3 we discuss the data. In Section 4 we present the empirical analysis. In the conclusion we summarize the main empirical findings and provide a research agenda.

2. Vacation Policy and the Worker's Choice Set

Because there is virtually no discussion of vacation policy in the labor economics literature, we set the stage by discussing the implications of vacation policy for the tradeoff between earnings and hours that workers face.[7] Assume that days worked is the only dimension over which hours vary, and that people work five days a week. Suppose the worker has preferences over consumption C and leisure VT, where $VT = 52 - H$, H is weeks worked, and VT and H are measured in 5 day work weeks. Let VP be paid vacation and VU be unpaid vacation, with $VT = VP + VU$. The worker's annual earnings E are determined by the function

[7] Beam and McFadden (1998) and Maniaci (2001) discuss employee leave policies from a personnel management perspective.

$E(VT; VP, VU_{max}, w_{cash}, \text{CARRY-OVER}, p)$

where p is the worker's weekly productivity, VU_{max} is the maximum amount of unpaid vacation that the firm will permit, w_{cash} is the price at which a worker may cash in vacation time, and CARRY-OVER indicates whether a worker may carry over vacation to the next year or subsequent year.

If VT may not exceed paid leave ($VU_{max} = 0$) and unused vacation may not be carried over or cashed in, then the worker's budget constraint is

(2.1) $E(VT; VP, VU_{max} = 0, w_{cash} = 0, \text{CARRY-OVER} = \text{no}, p)$

$$= \quad 0 \qquad \text{if } VT > VP$$

$$= \quad p\cdot(52-VP) \qquad \text{if } 0 \le VT \le VP.$$

Assuming a competitive labor market, the worker will be paid a weekly wage of $p\cdot(52-VP)/52$ throughout the year.

There is no difference from the worker's point of view between the above policy with VP equal to some value VP_0 and $VU_{max} = 0$ and an alternative policy with $VP = 0$, $VU_{max} = VP_0$, the requirement that the worker take unpaid leave, and a payrate of p while working.

Below we display Table 18 from the Bureau of Labor Statistics 1997 Employee Benefits Survey (EBS), which reports the fraction of full-time workers in medium and large private establishments who can cash in vacation days. Fifty-two percent of all workers who receive paid vacation for whom data are available can neither carry over nor cash in vacation, and so their budget constraint is described by (2.1). Fourteen percent of all workers can cash in vacation days but not carry them over, 11 percent can either cash them in or carry them over, and 24 percent can only carry them over. (The corresponding values for 1988 are 15, 5, and 25 percent, suggesting an increase in flexibility of vacation time.)[8]

[8] The table also shows substantial variation by occupation category. A much larger percentage of professional and technical employees can carry over vacation, which is consistent with the idea that the work schedules for such workers may be tailored to variation over time in the needs of the firm and/or the workers.

Table 18. Paid vacations: Percent of full-time employees by unused vacation policy, medium and large private establishments, 1997

Type of plan	All employees	Professional, technical, and related employees	Clerical and sales employees	Blue-collar and service employees
Number (in thousands) with paid vacations	36,607	10,279	8,928	17,400
	Percent			
Total with paid vacations	100	100	100	100
Carryover only	23	36	27	14
Cash-in only	13	6	8	19
Carryover and cash-in	10	18	9	7
Unused benefit lost	49	38	52	55
Data not available	5	3	5	5

NOTE: Because of rounding, sums of individual items may not equal totals. Where applicable, dash indicates no employees in this category.

Source: Employee Benefits in Medium and Large Private Establishments, 1997, Bureau of Labor Statistics, Bulletin 2517, 1999.

When workers can cash in vacation weeks at the rate $p\cdot(52–VP_0)/52$, the budget constraint is

(2.2) $E(VT;\ VP,\ VU_{max} = 0,\ w_{cash} = p,\ \text{CARRY-OVER} = \text{no},\ p)$

$= \quad 0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{if } VT > VP$

$= \quad p\cdot(52–VP) + p\cdot(VP–VT) \ = \ p\cdot(52–VT) \qquad \text{if } 0 \le VT \le VP.$

There is no difference from the worker's point of view between the above policy with VP equal to some value VP_0 and an alternative policy with no paid vacation, $VU_{max} = VP_0$, and no requirement that the worker actually take $VT = VU_{max}$. Annual earnings, VT, and H would be the same. The hourly wage would be $52/(52–VT)$ higher for the worker without paid vacation when she is working and 0 when she is not. (If the cash in rate is the normal weekly wage $p\cdot(52–VP_0)/52$ rather than productivity p, then the worker without paid vacation is slightly better off.)

Finally, consider the case in which workers may carry over VP but are not permitted to cash it in or to take unpaid vacation. In this case, the earnings function is the same as (2.1), but the stock of vacation days available to the worker in the following year increases by $VP – VT$. Many company

plans that allow carryover cap the amount at a certain number of days.[9]

Casual empiricism suggests that the situation is more complicated than the above three special cases might imply. First, the timing of vacation schedules is often subject to the employer's approval. Second, workers face a multiperiod budget constraint in which future wage rates are based upon past performance levels. In some cases, workers may face an implicit trade-off between *VT* and advancement prospects even when *VT* is less than *VP*. Third, although we do not have data on this, some employers require workers to take vacation time. Finally, several human resources textbooks that we consulted mention that some firms offer employees the option of "buying" additional vacation time as part of a flexible benefits package. (These are similar to plans in which employees are permitted to take some unpaid leave.) We could not find evidence on the prevalence of such plans. A major goal of the paper is to assess the degree to which rigidities in vacation policy determine vacation time taken and annual hours worked.

3. Data

We have identified two U.S. household datasets with panel data on vacation time.[10] The first is the Panel Study of Income Dynamics (PSID). The PSID contains panel data on wage rates, weeks worked per year and hours worked per week on the main job, hours worked on secondary jobs, whether the individual could have worked more or could have worked less on the job, whether she would have liked to have worked more, and whether she would have liked to have worked less even if "you earned less money." It also contains information about union membership, government employment, industry, occupation, location, education, race, labor market experience, job seniority, quits, and layoffs.

VT is based on responses to the question, "Did you take any vacation or time off during 19XX? How much vacation or time off did you take?" Heads of household were asked the question in all years and wives were asked in 1976 and from 1979 on. We use data for the calendar years 1975-1991. *VP* is based on responses to the question, "How many weeks of paid vacation do you get each year?" The question was asked of employed heads of household in 1975-1977 and 1984 and of employed wives in 1976 and 1984.

[9] For example, Yale University's policy states, "The University encourages employees to use their vacations for rest and relaxation. Consonant with that policy, employees with less than 10 years service may carry a maximum of 44 unused vacation days into the new fiscal year" (http://www.yale.edu/hronline/busmgr/0305/hr_e.html).

[10] In the Current Population Survey (CPS) persons who report that they were temporarily absent or on layoff "last week" are asked why they were absent. "On vacation" is one of the responses. The CPS could support an analysis of trends in vacation time but lacks the panel structure and rich set of covariates that are in the PSID and the HRS.

The measures of quits, layoffs, job seniority, and labor market experience are taken from Altonji and Williams (2005). The coding of most of the other variables used in the study is reasonably straightforward and is summarized in Appendix A.

Our analysis of the effects of occupation uses information on occupational characteristics from the Dictionary of Occupational Titles (DOT) aggregated to the three-digit Census occupation category. The measure of gender composition of the occupation is the proportion of female workers in the worker's three-digit Census occupational category. The estimates below use the proportion female based on the 1980 Census.[11]

We make limited use of the Health and Retirement Study (HRS). The sample is composed of persons between the ages of 51 and 61 at the start of the survey and their spouses. The 1992, 1994, 1996, 1998, 2000, and 2002 waves contain questions about weeks of paid vacation, the number of days of paid sick leave allowed each year, and the number of days of work missed during the previous 12 months because of health problems. The HRS provides data on whether the person could reduce hours, whether the person would like to reduce hours even if earnings were reduced proportionately, whether the person could increase hours, whether the person would like to increase hours if earnings were increased proportionately, and how many additional hours the person would like to work. It also provides data on job seniority, job mobility, and fringe benefits. The information is available for both the sample member and the spouse of the sample member. The major disadvantages of the HRS for our purposes are the facts that it does not ask about weeks of vacation taken and that it covers a relatively narrow age range. Means for the PSID and HRS of the main variables used in the study are in Table A1.

4. Empirical Results

4.1 The Distributions of Weeks of Paid Vacation Received and Weeks of Vacation Taken

What are the distributions of paid vacation time and unpaid vacation time? Do people use all of their paid vacation time? Is there substantial unpaid vacation time? How do the two measures interrelate? To answer these questions, we start by displaying the distributions of weeks of paid vacation (*VP*) and weeks of vacation taken (*VT*). In Section 4.2 we discuss trends in vacation leave and in Section 4.3 we use regression methods to examine the relationship between the two vacation measures and work hours.

[11] We obtain similar results when we linearly interpolate using information from the 1980 and 1990 Censuses.

We focus on persons who work 35 or more hours per week on their main job, were between the ages of 19 and 59, had left school and not returned, had not retired, and were not self employed. We do not condition on weeks worked per year. To insure that reports of vacation time over the year refer to persons in the same job for the entire year, we also restrict the analysis to individuals with at least .5 years of seniority at the time of the survey and exclude observations in a given year if the current job ended prior to the next interview. Unless stated otherwise, we use these sample restrictions throughout the paper.

Figure 1 presents the distributions of paid vacation weeks (*VP*) and vacation weeks taken (*VT*) for men based on the years when both are available. (The distribution of *VT* using 1975-1991 is similar, as shown in Appendix Figure A4.) We find that 10.7 percent of the men report no paid weeks, 11.9 percent report 1 week, 34.3 percent report 2 weeks, 19.4 percent report 3 weeks, 14.1 percent report 4 weeks, 6.4 percent report 5 weeks, and 3.2 percent report 6 or more weeks. The distribution of *VT* is similar. The distributions of *VP* and *VT* for women are similar to those for men (Figure 2). However, 10.0 percent of women report 8 or more weeks of vacation taken while only 2.1 percent report 8 or more paid weeks.

Figure 3 presents the distribution of *VT – VP*. The difference is zero for 51.7 percent of the men and 46.2 percent of the women.[12] For men the distribution between the values of -4 and 4 is skewed to the left, indicating that men are more likely to take fewer vacation weeks than they are paid for. This is also true for women, although the skew is less pronounced. Taken at face value, the figures suggest that in a given year many workers take less vacation or more vacation than they are paid for. Part of this is probably measurement error. Part may reflect decisions to carry over paid vacation across years and part may reflect occupations with a seasonal component to the work year. For men and women combined teachers account for only 3.4 percent of the sample but for 38.7 percent of the cases where *VT* exceeds *VP* by more than 2 weeks.

4.2 Time Trends in Weeks of Paid Vacation and Weeks of Vacation Taken

We have estimated a full set of year dummies in regressions for *VT* that also contain the detailed set of control variables used in Table 3, column 4. These consist of demographic characteristics, experience, seniority, union membership, government employment and industry and

[12] In Appendix Figures A1, A2, and A3 we present the distributions of *VP*, *VT*, and *VT – VP* for people who work between 15 and 34 hours per week on their main job. Thirty-four percent of the men and 41.2 percent of the women in this group report 0 for *VP*. 32.5 percent of the men and 21.7 percent of the women in this group report 0 for *VT*. It is unclear how part time workers interpret the question, "did you take any vacation or time off?"

occupation dummies. The year dummies (not reported) show an inverted U-shaped pattern in which *VT* rises by about 1 day between 1975 and 1983 and then slowly returns to mid-1970s levels by the early 1990s. In the PSID we do not have enough years of data to study trends in *VP*. The Bureau of Labor Statistics' the Employee Benefits Surveys (EBS) for 1982 (Table 8) and 1988 (Table 5, Table 108) show little change in paid vacation days for full-time workers in medium and large firms when coverage changes in the survey are taken into account. Between 1988 and 1993 paid vacation days increased by about .5 days, with the largest increase for professional and administrative employees (EBS 1988-Table 5; EBS 1993-Table 11). Between 1993 and 1997 *VP* rose by about .2 days for seniority of 10 or less with a small decrease for higher seniority levels (EBS 1997-Table 13). It is difficult to make comparisons after 1997, because the published tables for full-time workers are no longer broken down by firm size. However, the available information suggests that any changes are small.

4.3 The Effect of Weeks of Paid Vacation on Weeks of Vacation Taken, Weeks Worked, and Annual Hours Worked

The Effect of Weeks of Paid Vacation on Weeks of Vacation Taken

In Appendix Table A2 we report the means of *VT* and various measures of hours worked for a given value of weeks of *VP*. Men who report 0 paid weeks take an average of 2.39 weeks of vacation taken. Surprisingly, weeks taken fall to 1.38 for persons reporting 1 paid week. Weeks taken then rise with paid weeks. Women show the same pattern. Weeks worked on the main job more or less mirror the pattern of vacation weeks taken (column 2). The table suggests that there are some 35+ hours per week jobs that allow for substantial amounts of "unpaid" time off but do not provide paid leave. Many of these jobs are in education---38.9 percent of K12 and college and university teachers report positive *VT* and 0 *VP*. 28.2 percent of the individuals in the education services industry report positive *VT* and 0 *VP*. As noted in Section 4.1, some jobs with 0 paid vacation weeks may have a strong seasonal component to demand, such as construction work. For seasonal jobs, the implicit employment contract may be structured so that vacation is taken during the off season, perhaps with a subsidy from the unemployment insurance system.[13]

[13] Effort by the PSID interviewer to insure that reports of vacation weeks, weeks worked on the main job, weeks lost due to illness, etc. sum to 52 may build in negative correlation between measurement error in *VT* and weeks worked. Consequently, one cannot directly examine the link between vacation weeks and unemployment weeks because they are mutually exclusive categories in the survey. Instead, we examine the link between *VT* and employment status at the survey date. The mean of *VT* is 1.28 for individuals who are unemployed at the survey date in given year, 3.12 for persons on temporary layoff, and 2.93 those who are employed. A regression containing the controls in Table 1, column

Regression provides a clearer picture of the relationship between *VP* and *VT*. The first row of Table 1 reports OLS estimates of the coefficient of the regression of *VT* on *VP* and alternative sets of control variables for the pooled sample of men and women. (To reduce the influence of outlier observations and reporting error we recoded the approximately 1 percent of observations reporting more than 7 paid weeks to 7.) The regression coefficient on *VP* is only .467 (.019) when we exclude all controls. However, when we add a dummy *1(VP>0)* for whether the worker receives paid vacation, the coefficient on *VP* rises to .799 (.023) (row 1, column 2). The coefficient on the dummy *1(VP > 0)* is -2.80 (.110). Part of this effect is related to the substantial difference in the nature of jobs that do and jobs that do not offer paid vacation.[14] When we include *1(VP > 0)* and add controls for education, a quartic in experience, the interaction between education and experience, marital status, disability status, sex, race, city size, region, and calendar year, the coefficient on *VP* falls to .671 (.024). Thus, *VP* has a strong influence on *VT*, but the effect is not 1 to 1. The coefficient falls to .430 (.027) when we add controls for seniority (a cubic), union membership, and government employment. Intertemporal substitution in the use of *VP* cannot easily explain the shortfall, because such substitution is likely to introduce a mean zero error into the model. However, reporting error in *VP* could explain the shortfall.

We address reporting error in two ways. First, we have re-estimated the models in row 2, columns 1-6 using a 2 step estimator in which we first predict weeks of paid vacation using weeks of paid vacation in the previous year and the other variables in the model. When we control for *1(VP > 0)*, the coefficient on paid weeks rises to between .979 (.052) and 1.10 (.034) depending on the control set used (row 2, columns 2 and 6). Second, we exploit the fact that *VP* depends strongly on job tenure by re-estimating the models in columns 1-4 using the first 3 powers of tenure as the instrumental variables. This requires the assumption that seniority does not have a direct influence on *VT* given *VP*. When we control for *1(VP > 0)*, the coefficient on *VP* is .985 (.045) when all other controls are excluded and 1.28 (.059) when they are included (row 3, columns 2 and 4).

Overall, the regressions of *VT* on *VP* indicate that, on average, *VT* rises about one for one with

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2 plus industry dummies indicates that mining and extraction, agriculture, forestry and fishing, durable goods, and educational services all have unusually large amounts of *VT* relative to *VP* (not reported).

[14] For men, 33.6, 12.4, and 13.6 percent of jobs with no paid vacation are in construction or agriculture, forestry and fisheries, or educational services (respectively), while only 3.9, 1.2 and 4.4 percent of jobs with paid vacation are in these industries. Men in jobs with no paid vacation have lower tenure, are less educated, are less likely to be married, are more likely to be black, and are less likely to be unionized than men who receive at least a week of paid vacation. Few women are in agriculture and construction, which are the source of many of the *VP* = 0 observations for men. In contrast, for women educational services account for 42.4 percent of the jobs with no paid vacation but only 10.5 percent of the jobs with paid vacation. Personal services accounts for 8.6 percent and 3.8 percent, respectively.

weeks of paid leave even though *VT* fluctuates around paid weeks for a given year. We cannot rule out the possibility that the difference in the 2 step estimates using lagged *VP* with controls for tenure and the IV estimates using tenure as an instrument arises because variation across firms in *VP* has a weaker relationship to *VT* than the component of variation associated with tenure. This might be the case if implicit norms about vacation time influence *VT* given *VP* and vary less than one to one with *VP* across firms.

Vacation Time and Hours and Weeks Worked

In the top panel of Table 2, we report OLS estimates of the relationship between *VT* and various work time measures. Each coefficient (standard error) in the table refers to a separate regression. The column headings identify the dependent variable and the row headings indicate the controls used. When all controls are excluded, the coefficient of *VT* on annual hours worked on all jobs is -44.3 (1.1), which indicates that an extra week of vacation is associated with about 1 less week of work (column 6, row 1). The coefficient is -51.6 (1.1) when the demographic controls are added and -45.3 (1.2) when tenure, union membership, and government employment are added. Almost all of the effect is through weeks worked on the main job. The relationships between *VT* and hours/week and *VT* and annual hours on extra jobs are weak.[15]

The second panel of Table 2 presents regressions results using *VP* as the vacation measure. (The means of the hours measures by VP level are in Table 1.) When the demographic controls are included, the effect of *VP* on weeks worked is only .015 (.038), in sharp contrast to the coefficient of -1.09 (.012) using *VT*. There is a similar discrepancy between the effects of *VP* and *VT* on annual hours worked on all jobs (column 6).

The discrepancy between the results for *VP* and *VT* is accounted for by the substantial positive difference in weeks worked between persons who receive 1 paid week and persons who receive no paid vacation. When we add the dummy variable *1(VP > 0)* to the model with the basic control set, the coefficient on *VP* is -.626 (.046) for weeks worked and -24.5 (4.03) for annual hours on all jobs (Table 2a, columns 1 and 6). 2SLS estimates of the effect of *VP* on weeks worked using the first 3 powers of tenure as the excluded instruments (Table 2a, bottom) are more negative than but reasonably consistent with the OLS estimates of the effect of *VT* in Table 2 and the OLS estimates of

[15] When we include the basic set of controls, we find that hours/week on the main job drop by .195 (.017) hours per week with each extra week of vacation (column 2, row 2). This amounts to an annual reduction of about 10 hours for someone working 50 weeks. However, the coefficient on *VT* is only -.067 (.019) when seniority, union membership, and government employment are controlled for. The corresponding coefficient for annual hours on extra jobs is 3.64 (.682) when the basic set of controls is included and 3.17 (.735) when the full set is included.

the effect of *VP* in Table 2a, especially when sampling error is kept in mind. Basically, an extra week of paid vacation is associated with a reduction in weeks worked on the main job with no offset or even a small reduction in the other dimensions of work hours.

It is interesting to compare our results for vacation time at the individual level to the country level analysis of Altonji and Oldham (2003). Altonji and Oldham regress annual work hours on the minimum number of weeks of paid vacation and holiday required by law for a panel of several European countries and the U.S. When they control for year and country, they find that an additional week of legislated paid vacation reduces annual hours worked by 51.9 (11.7) hours. This estimate in conjunction with other estimates for alternative specifications in their paper implies that mandating an extra week of paid vacation translates approximately one for one into a reduction in weeks worked. It suggests that the laws are binding for vacation time and that there is little or no offset through other dimensions of hours.

4.4 Personal Characteristics and Vacation Time

In Table 3 we display the coefficients on personal characteristics in regressions for *VT*, *VP*, and *VT – VP*. Columns 1-3 exclude controls for a cubic in tenure, union membership, and government employment. Controls for labor market experience (a cubic), education times experience, city size, region, and calendar year are also included in the regression models (not reported).

Women take .973 (.072) more weeks of vacation than men but receive only .070 (.043) more paid vacation. *VP* and *VT* are both a bit higher for married people. Blacks receive and take about .26 fewer weeks vacation than whites.

Perhaps surprisingly, those with a health problem that hinders work take about .344 (.117) fewer weeks of vacation but receive about the same amount of paid vacation. One might speculate that health problems boost sick time but reduce reported vacation time taken for a given number of weeks of paid vacation. Paid sick leave might lead to a reduction in vacation time taken to recover from illness.[16]

[16] The HRS lacks data on vacation time taken but does report days of work missed due to health and the number of days of paid sick leave at full pay the individual earns each year, which we have converted to 5 day weeks. The data are only obtained for persons who are with new employers or who have changed positions with an employer. In a regression of weeks lost due to illness on *VP*, paid sick weeks, dummies for *1(VP > 0)* and 1(paid sick weeks > 0), controls for demographic variables, seniority, union membership, and government employment, the coefficient on *VP* is -.050 (.031) and the coefficient on paid sick weeks is .214 (.032). Thus, there is little evidence that employees use paid vacation as sick leave. In a similar regression for paid sick weeks the coefficient on paid vacation weeks is .245 (.036). This positive

These basic results change only slightly when controls for seniority, union membership, and government employment are added in columns 4-6 of the table.

Interactions between Vacation Time of Husbands and Wives

Is the amount of vacation married men and women take constrained by the paid vacation time of their spouse? To investigate this, we regress *VT* on *VP*, *VP* of the spouse, indicators for (*VP* > 0) and (*VP* of spouse > 0) and control set 2 defined in Table 2. The sample is restricted to couples in which both spouses work 35 or more hours per week. For husbands the coefficient on *VP* of the wife is .134 (.062). For wives the coefficient on *VP* of the husband is -.141 (.105), which is opposite from what one would expect if vacation time of husbands and wives are complements but is not statistically significant.[17]

We also tried replacing *VP* of the spouse with the function min(*VP*, *VP* of the spouse). If leisure time of the husband and wife are complements, then the spouse with the least amount of paid vacation may constrain vacation taken by the other. This would imply a positive coefficient on min(*VP*, *VP* of spouse) when *VP* is also controlled for. A substitution effect could go the other way. The coefficient on min(*VP*, *VP* of spouse) is .297 (.091) in the husband's equation, but -.290 (.169) in the wife's equation.

In summary, *VT* is increasing in spouse's *VP* for husbands and decreasing for wives. However, the coefficient on spouse's *VP* is statistically insignificant in the case of wives, and so we should not make too much of the asymmetry.

4.5 The Relationship between Wage Rates and Weeks of Paid Vacation

Assume that a worker is on her labor supply curve and works 50 weeks a year. Then by the envelope theorem she should be willing to reduce weeks worked by one week in exchange for a reduction in pay of about $1/50^{th}$, or two percent. Alternatively, suppose the worker must choose between a job that offers two paid weeks of vacation with no unpaid leave permitted and a job offering one paid week and one unpaid week of vacation. The worker will be indifferent between the two jobs if they provide the same annual compensation. This will occur if the hourly wage rate for the job with two paid weeks is approximately two percent lower than the hourly wage for the job

value is consistent with the view that the generosity levels of the various benefits that firms offer are positively correlated. We return to this issue in Section 4.5.

[17] The sample sizes are only 1,340 for husbands and 1,144 observations for wives in part because data on paid vacation for wives is only available in 1976 and 1984. We obtain similar results when we drop the 35+ hours restriction.

offering only one paid week of vacation. This prediction follows from the budget constraint. It is sharper than the predictions one normally obtains from the theory of compensating differentials because in most applications one does know how the job attribute is valued while in the second example the person works fifty weeks in both jobs.[18]

On the other hand, the search theoretic models of Hwang, Mortensen and Reed (1998), Lang and Majumdar (2004), and Dey and Flinn (2005) are consistent with a positive relationship between vacation weeks and wages. One possibility is that heterogeneity across firms in the value of a match leads some firms to adopt high wages and fringe benefits to increase offer acceptances and reduce turnover. The most likely story is that the amount of vacation leave that best balances preferences of firms and workers is increasing in the skill level of the jobs and is positively associated with wages. Wages and vacation time tend to move together as job changers move up and down the job quality ladder as a result of random search outcomes and employer learning about worker quality.

In Table 4 we report estimates of the effect of paid weeks of vacation on the log hourly wage rate. The sample consists of men and women. Columns 1-3 report results for the combined sample of hourly and salary workers. Columns 4-6 are for hourly workers and columns 7-9 are for salary workers. The model in columns 1, 2, 4, 5, 7, and 8 contains the linear term *VP* and the dummy *1(VP > 0)*. In contrast to the simple compensating differentials story, for the hourly worker sample the coefficient on *VP* is .095 (.004), which is positive rather than negative (column 4). The coefficient on *VP* declines to .077 (.005) when demographic controls, seniority, union membership, and government employment are all controlled for. Results for the combined sample and for the salaried sample are similar.

Note, however, that the coefficient on *1(VP > 0)* is large and negative for the combined sample and for hourly workers, although it is positive for salary workers. Columns 3, 6, and 9 report estimates of a model containing dummy variables for each vacation category, with *VP* = 2 as the reference category. As one can see, the move from 0 to 1 week is associated with a decrease in wages in all three samples, as predicted by the theory of compensating differentials, but the decrease

[18] If workers are over employed at the standard level of vacation weeks, as some proponents of minimum vacation laws argue, the compensating differential for giving up a week of paid leave and working should be even larger than 1/50. To see this, assume that workers are not hours constrained at a job offering the wage rate $w(VP^*)$ and VP^* paid weeks of vacation. Let $w(VP^{**})$ for some $VP^{**} < VP^*$ be the wage rate at which the individual is indifferent between working $52 - VP^*$ weeks and receiving $52 \cdot w(VP^*)$ and working $52 - VP^{**}$ weeks for $52 \cdot w(VP^{**})$. Following along the lines of Abowd and Ashenfelter's (1981) analysis of hours constraints, one may show that

$$\frac{w(VP^{**}) - w(VP^*)}{W(VP^*)} \approx .5\frac{1}{e} \cdot \frac{(VP^* - VP^{**})^2}{52 \cdot (52 - VP^*)} + \frac{VP^* - VP^{**}}{52}$$

where e is the compensated labor elasticity. If e is .2 and VP^* is 5, then $w(2)$ should exceed $w(5)$ by about 6.7 percent of the $w(5)$ wage. If $VP^* = 5$, $w(2)$ should exceed $w(3)$ by about 2.3 percent of the $w(2)$ wage.

is unreasonably large for hourly and salary workers combined and for hourly workers. After that, wages rise substantially with additional weeks through the 5th week. We have already documented that the occupation and industry distribution of jobs with *VP* = 0 differs substantially from that of jobs which offer paid vacation. We have also shown that *VT* is higher and annual weeks worked is lower in jobs with *VP* = 0.

Appendix Table A3 reports similar results for the HRS. For example, for hourly workers the coefficients on *VP* and *1(VP > 0)* are .062 (.004) and -.061 (.015) in the specification corresponding to column 5 of Table 4.

Presumably, the positive wage coefficient in the HRS and the PSID reflects bias from unobserved skills of the worker and/or characteristics of the job that influence wages and paid vacation in the same direction. Such bias in wage level regressions is widely discussed in the compensating differentials literature. Adding two-digit occupation controls and two-digit industry controls reduces the coefficient on *1(VP > 0)* by about half but has little effect on the *VP* coefficient. A number of papers have used job changes to examine the link between wages and job characteristics, including early papers Brown (1980) and Duncan and Holmlund (1983) and recent papers by Usui (2004) and Villanueva (2004). The HRS sample is sufficient to permit estimation of wage change regressions of the form

$$(4.1)\quad \Delta W_{it} = a_0 + a_1 L_{it} + a_2 Q_{it}\Delta VP_{it} + a_3 Q_{it}\Delta[1(VP_{it} > 0)] + a_4 L_{it}\Delta VP_{it} + a_5 L_{it}\Delta[1(VP_{it} > 0)] + a_6 \Delta OCC_{it} + a_7 \Delta Z_{it} + u_{it}$$

where Δ is the first difference operator across time, W_{it} is the log wage, Q_{it} is 1 if the person changed jobs between surveys due to a quit and L_{it} is 1 if the person changed jobs due to a layoff, OCC_{it} is a vector of occupation dummies, and Z_{it} consists of a cubic in tenure, a quartic in experience, education times experience, health limitation dummies, and dummies for marital status, union membership, government employment, region, and year. We restrict the sample to job changers who were less than 60, had not retired, and worked more than 35 hours per week in both the current and previous survey years.

The estimates are reported in Table 5. Column 4 refers to the combined sample of hourly and salary workers. The estimate of a_2 is .038 (.010) and the estimate of a_4 is .046 (.014). The positive coefficients cannot be easily be attributed to bias from unobserved variation in worker skill and are also hard to square with a simple story about bias due heterogeneity in wage offers across job matches for a given value of *VP*.

The positive association between wages and *VP* is mirrored in the relationship between *VP*

and fringe benefits. Using fringe benefits data from the 1984 wave of the PSID, we obtain substantial positive coefficients when we regress dummies for whether the employer provides health insurance, paid sick days, dental benefits, life insurance, and a pension plan on *VP* and the full set of controls (not shown). In the HRS we also find a strong positive association between *VP* and presence of a pension plan. We have also used the HRS to study the relationship between changes in benefits and changes in *VP* following a quit or a layoff using a regression specification analogous to column 3 of Table 5. For both quits and layoffs the change in the probability of having a pension plan is positively related to the change in the number of weeks of *VP*. The change in the probability that the worker gets sick leave is also a positive function of *VP* in the case of quits.

In summary, we find that the wage and other job benefits vary positively with *VP*.

4.6 Hours Constraints and Vacation Time

We use a series of questions in the PSID about whether the individual would like to reduce hours "even if it meant less money" and whether the individual could have worked less if she wanted to to construct an overemployment indicator. We also used a parallel set of questions to construct a measure of underemployment. Precise estimates from separate probit models with controls for demographic characteristics, job seniority, union membership, government employment and *1(VP > 0)* show that the effect of *VT* and *VP* on the probability of reporting overemployment is essentially zero. Using similar questions in the HRS we find that one week of paid vacation raises the probability of overemployment by .006 (.003). In both the PSID and the HRS the probability of reporting underemployment falls with *VT* and with *VP*. In the PSID an extra week of *VP* is associated with a reduction of .022 (.005) in the probability of reporting underemployment, which compares to the mean probability of .268. Consequently, we have no evidence suggesting that vacation time alleviates overemployment or exacerbates underemployment, in contrast to what popular discussion of the "overworked American" might lead one to expect.[19]

4.7 The Effects of Experience, Seniority and Job Mobility on Vacation Time

In this section we measure the effects of experience and seniority on *VP* and *VT*, establish that vacation time is largely a function of tenure rather than labor market experience, and provide suggestive evidence that vacation time reflects broad firm policy rather than the preferences and

[19] In the PSID we obtain similar results for women with children under 12.

bargaining power of individual workers.

OLS and Instrumental Variables Estimates of the Experience and Tenure Profiles

In Table 6 we present estimates of the effects of labor market experience and tenure on *VT*, *VP*, and *VT – VP*. The estimates are based on regression models that a cubic in tenure, a quartic in experience, the interaction between experience and education, and a set of control variables. We estimate separate models for men and women.

Column 1 presents OLS estimates of the effects of 2, 5, 10, and 20 years of tenure and 5, 10, 20, and 30 years of experience prior to the start of the job. The results show that *VT* rises by .258 (.019) over the first two years on the job, 1.14 (.048) over the first 10 years, and 2.00 (.044) over the first 20 years. The relationship between *VT* and experience is flat.[20] Column 2 uses Altonji and Shakotko's (1987) instrumental variables strategy to deal with the possibility that tenure is correlated with unobserved person specific and job specific heterogeneity that also influences *VT*. The estimated effects of seniority on *VT* are about one third less than the OLS estimates, and the estimates of the effects of experience are close to zero.

The second panel of the table reports estimates for *VT* for the sample used to study *VP*. The estimates of the effect of seniority are very similar to estimates for the full set of years, although the standard errors are much larger in the IV case.

The third panel reports estimates of the effects of tenure and experience on *VP*. The OLS estimates and the IV estimates are very similar for both men and women through ten years of seniority. The IV estimates actually lie above the OLS estimates at 20 years, although the IV estimates are very noisy and the difference is not statistically significant. In general, the choice between the OLS and the IV estimator makes much less difference for vacation time than for wages. Paid vacation time varies very little with experience. Both the OLS and the IV estimates imply that for men paid vacation rises more rapidly with tenure and than weeks of vacation taken. The point estimates suggest the opposite for women, although standard errors are large for both groups, especially in the IV case for women.

Table 7 reproduces a table from the 1997 EBS that reports average paid holidays and paid vacation and average paid sick leave for full-time employees in medium and large private establishments by tenure. The table implies that vacation days increase by an average of about one

[20] Simple crosstabs of *VP* by experience and seniority in the previous year for full-time men also indicate that *VP* and *VT* rise by about 2 weeks over the first 15 years on the job and that *VP* has little to do with experience conditional on tenure (not shown).

half days per year over the first 20 years and very little after that.[21] One cannot tell from the Table 7 how uniform the policies are within the many firms, but the EBS is very consistent with the PSID based estimates of the tenure profile of *VP*.

The Link between Vacation Weeks Across Jobs

If vacation time can be bargained over, then workers who had long vacations on their previous job will use this as a bargaining chip for more vacation time on the new job in much the same way that wage rates on a previous job influence reservation wages for any new job. Furthermore, if the amount of paid and unpaid leave is to some extent at the discretion of employees, then those who chose relatively long vacations on a previous job are likely to choose long vacations on the new job. On the other hand, if vacation time is set by rigid firm wide policy, then prior vacation time will have little influence on the vacation in the new job, other than through job selection.

In Table 8 we report the coefficient of the regression of *VT* on current job on the average of *VT* during the last two years of the previous job and a full set of controls, including current seniority and experience at the start of the job.[22] We average *VT* to reduce the effects of reporting error and random variation in when vacation on the previous job is taken. The coefficient on past *VT* is .216 (.056). Measurement error in the two-year averages probably biases these estimates downward, while fixed heterogeneity across workers in leisure preferences or in the prevailing vacation packages in particular occupations and industries biases them upward. When we add dummies for the current two-digit occupation, the coefficient falls to .094 (.057). When we restrict the sample to cases in which the previous job ended due to a quit, we obtain the estimates of .282 (.072) or .150 (.078) depending on whether or not we control for occupation (columns 4 and 5). The results for layoffs are .291 (.088) with occupation controls excluded and .176 (.090) with occupation controls included.

Table 9 reports similar regressions using *VP*. Because *VP* is only available for the years 1975-1977 and 1984, the sample size of job changers is small. When we use *VP* in the last year of the previous job rather than the average of the values for the last two years, we obtain a coefficient of .121 (.058) when occupation controls are excluded and only .010 (.058) when occupation controls are included. These coefficients rise to .338 (.093) and .251 (.106), respectively, when we use two year averages, although the sample size is only 158.

[21] Buckley (1989) presents summary tables on paid vacation time using the Employee Benefits Survey for 1983-1986. The CPS does not appear to have ever collected information about vacation weeks.
[22] We continue to drop an observation if tenure at the survey date is less than .5 or if it is the last observation on the job.

Taken at face value, the results suggest that prior vacation has only a small effect on vacation on the new job once occupation is controlled for. Some relationship would be expected to arise through the effect of vacation time in the old job on the reservation locus of job characteristics to induce a job change. It is fully consistent with the fact that tenure on the previous job has little to do with vacation time on the new job.[23] Evidently, people who had a lot of vacation on their old job are unable or unwilling to bargain for a similar vacation on the new job. To a large degree, vacation policy is set firm wide.

To put the results in perspective, the middle panel of Table 8 reports regressions of hours per week on the current job on the average of hours per week in the last two years on the previous job. The coefficient is .312 (.028) when occupation is not controlled for and .263 (.031) when occupation is controlled for. These coefficients are larger than the corresponding values for vacation time, but suggest that work hours are heavily influenced by the specific job and not easily amenable to bargaining. In contrast, the bottom panel presents regressions of the log of the hourly wage rate in the current job on the average for the last two years on the previous job. The coefficients are .682 (.028) without occupation controls and .668 (.028) with occupation controls. Part of the difference probably reflects a more important role for fixed individual heterogeneity in the determination of wage rates than in the preferences for hours. That is, even if people are perfectly free to choose hours per week and vacation time, there might be less heterogeneity in these variables than in the productivity factors underlying wage rates. Overall, the results suggest, in common with other evidence regarding work hours mentioned in the Introduction, that vacation time as well as work hours are governed by broad policies of the employer. They are not heavily influenced by the preferences or alternative opportunities of a particular worker.

4.8 The Effects of Union Membership, Government Employment, Industry and Occupation Characteristic, and Gender on Vacation Time

The above analysis suggests that vacation time reflects employer policy. We now examine variation in vacation time across job types. Conditional on demographic characteristics and experience and tenure, union membership boosts *VT* by .487 (.067) weeks and *VP* by only .183 (.037)

[23] For a sample of job changers, a tabulation of weeks taken (*VT*) on the new job by experience and tenure on the previous job shows little systematic variation with either experience or prior tenure (not shown). This is true for both quits and layoffs considered separately. These results indicate that seniority-based vacation is usually lost when a person changes employers. They reinforce our finding of a relatively weak link between vacation on the previous job and the current job controlling for seniority on the current job. They suggest that employees are unable or unwilling to negotiate vacation on the new job on the basis of vacation on the previous one.

weeks. Government workers take 1.20 (.065) more weeks of vacation per year and receive .681 (.038) more paid weeks (Table 3, columns 4 and 5). Perhaps unions and civil service structures suppress "rat races" and so reduce the incentive of employees to forgo paid vacation. Another potential explanation for government workers is that "comp" time is more prevalent in the public sector and that "comp" time is taken as additional vacation but is not reported as paid vacation. We do not have any evidence on this at this point.

Table 10 presents estimates of the effects of occupation on *VT*, *VP* and *VT – VP* when demographic characteristics, seniority, union membership, and government membership are controlled for. The reference occupation is "Operatives, Except Transport." For *VT* we report estimates using the sample for 1975-1991. The largest coefficient in the *VP* equation is 2.42 (.138), which is for armed forces. Interestingly, for that group the coefficient on *VT* is only .426 (.099). In general, one obtains positive coefficients for *VP* in professional occupations. The two largest coefficients on *VT* are, not surprisingly, 7.44 (.075) for K12 teachers and 2.61 (.113) for college teachers and librarians.[24]

Vacation Policy and Hours Preferences of the Median Worker: The Effect of Percent Female in Occupation on Vacation Time

Rosen (1969) and Deardorff and Stafford's (1976) analyses suggest that job characteristics will be determined in part by the preferences of the typical worker in a job. Women work fewer hours than men even among full-time workers. Usui (2004) shows that for both men and women average annual hours worked is negatively related to the proportion female in an occupation. In the PSID vacation time is positively related to the proportion female in an occupation. Did the large changes over the past 3 decades in the gender composition of the workforce and the sharp increase in women's work hours weaken the relationship? The coefficient on percent female in an occupation is .482 (.134) for men and 1.28 (.290) for women for the years 1975-1983 in regressions that controls for demographic characteristics, seniority, union membership, government employment, a detailed list of occupational characteristics based upon the Dictionary of Occupational Titles, and a dummy

[24] We also regressed *VP* on characteristics drawn from the Dictionary of Occupational Titles, entering characteristics one at a time in regressions with our full set of control variables (not shown). Measures of general education development - math, language, reason, and specific vocational preparation (SVP) all enter positively and are highly significant. Measures of strength, climbing, stooping, balancing, kneeling, crouching, crawling, reaching, handling, fingering, feeling, talking, hearing, tasting/smelling, near acuity, far acuity, depth perception, accommodation, color vision and field of vision are negative in most cases. Proxies for bad environmental conditions typically enter negatively and are statistically significant in some cases.

for whether the person is a teacher. For the period 1983-1991, the coefficient is .247 (.124) for men and .589 (.198) for women. One hypothesis is that the decline in coefficients is the result of a decrease in the desired number of weeks of vacation among women between the two periods, as the labor force attachment of women has increased. Unfortunately, we cannot examine changes in the link between *VP* and percent female over the same period.

4.9 Implicit Contracts, Intertemporal Substitution over the Business Cycle and Vacation Time

To the extent that leisure is substitutable over time at annual frequencies, one might expect *VT – VP* to be countercyclical. It is efficient for workers to shift *VT* from booms to periods when business is slow. Research on intertemporal substitution over the business cycle has generally failed to explain movements in hours as a response on the labor supply curve to procyclical movements in wage rates. However, Barro (1977) and others have argued that hours per week and annual weeks worked are governed by implicit contracts in which hours decisions respond to an unobservable shadow price of labor that equates marginal revenue production with the marginal utility of leisure rather than to the contractual wage, which reflects marginal revenue product over a longer horizon. Such models are difficult to assess, however, because the shadow price is not observed. An examination of *VT* relative to *VP* provides a window on this possibility. Under such an implicit contract the timing of vacations would respond to the needs of the firm as well as the needs of the worker. Under the reasonable assumption that firms do not change paid vacation policy in response to short-term business conditions, cyclical variation in *VT – VP* would be similar to variation in *VT*, ignoring compositional changes in the job mix and work force over the business cycle.

We examine this issue by regressing *VT* on state level business cycle indicators for 1975-1991. The indicators consist of the state unemployment rate and the change in the state unemployment rate. We control for individual fixed effects to guard against spurious correlation between the labor market indicators and unobserved compositional changes in the workforce that influence vacation time, as well as for education, experience, job seniority, union membership, government employment, marital status, disability status, city size, region, and a quadratic time trend. Standard errors account for clustering at the state year level. In separate regressions we obtain a coefficient of .013 (.007) when we use the state unemployment rate as our business cycle indicator and a coefficient of .025 (.008) when we use the change in the state unemployment rate. The results suggest that vacation time is in fact weakly countercyclical, as predicted by models of intertemporal substitution. In summary, we have a little evidence that firms and workers adjust weeks worked

through the timing of vacations in response to changes in demand, but the magnitudes are small.[25]

5. Discussion and Conclusions

Once one steps beyond the standard labor supply model of hours determination in which workers are free to choose how much to work at a parametric wage, the study of work hours becomes very complicated. Vacation policy is a key component of the regulation of work hours and is an important job attribute, but has been the subject of very little research. Using the PSID and the HRS, we have provided the first detailed analysis of paid vacation time and vacation time actually taken. Our main findings are as follows.

1. There is substantial variation in both *VP* and *VT*. An increase in *VP* leads to an increase of one week in *VT*, but there is a significant amount of variation in *VT* around *VP*. There is little evidence that an extra week of *VP* is offset by increases in other dimensions of work hours, such as hours per week or annual hours on other jobs. An extra week of *VP* reduces annual hours worked by approximately one week.

2. Women take about one more week of vacation than men, but receive only slightly more paid vacation. Part of the gender difference in *VT – VP* is related to the high concentration of women in education and related field. *VP* and *VT* are both a bit higher for married people and about .26 weeks lower for blacks. There is weak evidence that married men take more vacation if their spouses have more paid vacation, holding their own *VP* constant, while married women take less vacation if their spouses have more paid vacation.

3. Hourly wage rates as well as our broad array of fringe benefits are positively related to *VP* both in the cross-section and across jobs.

4. Both *VP* and *VT* increase with seniority but are largely unrelated to labor market experience (conditional on seniority). For job changers vacation time on previous job has little relationship with vacation time on the new job. Our results suggest that vacation time is determined by firm wide policy and tends not to reflect the preferences and bargaining power of individual employees. Coordination costs do not provide a full explanation for the lack of heterogeneity, because within a firm vacation time varies with seniority. As noted in the introduction, a possible explanation is that correlation between hours preferences and unobserved factors that influence productivity and turnover may make workers reluctant to bargain.

5. Both *VT* and *VP* are higher for union members and government workers. *VT* and *VP* vary substantially across occupations and industries. *VT* is positively associated with percent female in an occupation controlling for the gender of the worker and other characteristics. The relationship between percent female and *VT* has declined

[25] If consumers are credit constrained, then complimentarity between market goods (travel fares, lodging, etc.) and time in the production of vacations is an offsetting force that could lead to procyclical variation in vacation time taken.

substantially over time, which is consistent with models in which the hours policy of the firm reflects the typical worker, and the work preferences of women and men have converged to some extent.

6. Vacation time taken is countercyclical, as predicted by some equilibrium business cycle models, but the relationship is weak.

A natural program for future research is the development and empirical testing of alternative models of the role of firms in determining work hours mentioned in the Introduction, with particular attention to leave policy.

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Appendix A: Description of Variables Used

Panel Study of Income Dynamics

Employment Variables:

1. *Paid vacation* (*VP*) is asked in 1975-1977, and 1984 for the heads and 1976 and 1984 for the wives. In 1975-1977, respondent is asked "How many weeks of paid vacation do you get each year?" In 1984, respondents who answered to "yes" to "Not counting holidays like Christmas and Labor Day, do you get paid vacation or personal days?" were asked "How much paid vacation or personal time do you get each year?" In 1984, respondents reported *VP* either in days per year, weeks per year, hours per year, or other (combination). We converted days per year and hours per year to 5 day weeks assuming 8 hours per day and rounded to the nearest integer.
2. *Vacation taken* (*VT*): Respondents who answered "yes" to "Did you take any vacation or time off during 19XX?" were asked "How much vacation or time off did you take?"
3. Indicators for quits and layoffs, job seniority and labor market experience are taken from Altonji and Williams (2005).
4. *Hourly rate of pay*: To reduce the influence of measurement error and outliers, wage rates are set to missing when they are less than $1.5.
5. *Industry and Occupation*: Coded based on three digit 1970 Census codes.
6. 0-1 indicators for union membership and government employment.
7. *Hours Constraints*: We construct the variables for overemployment and underemployment following Altonji and Paxson (1988, page 263, fn 7).

Demographic Variables:

1. *Marital status*: 0-1 indicator for married with spouse present and never married, divorced, separated, or deceased.
2. *Race*: Separate 0-1 indicators for black and nonwhite/nonblack. The excluded category in the regressions is white.
3. *Education*: 1-16 (fourth year college), 17 (at least some graduate work).
4. *Health limitation*: 0-1 indicator for whether the respondent has physical or nervous condition that limits the type of work or the amount of work.
5. *Region and urbanicity of current residence*: We include separate 0-1 indicators for northeast, north central, and west. The excluded category is south. Our urbanicity measures are a 0-1 indicator for whether the residence is in SMSA and a 0-1 indicator for whether the residence is in a large city more than 500,000 people.

The Health and Retirement Study

Information on age, gender, race, census region, education, current marital status, whether health limits work, labor force status, hours of work per week at current job, the wage rate, job seniority and labor market experience are taken from files produced by RAND Corporation.

Employment Variables:

1. *Paid vacation* (*VP*): Response to "How many weeks of paid vacation do you get each year?"
2. 0-1 indicators for quits and layoffs: The respondent was asked "Why did you leave that employer?" If the respondent reported either business closed or laid off/let go, then the separation is coded as layoff. If the respondent reported poor health/disabled, family care, better job, quit, family moved, divorce/separation, transportation, too much travel, and/or transferred, then the separation is coded as a quit. The respondent was allowed to report more than one

reason for leaving the employer. If the reasons given fall into both the quit and layoff categories we treated the separation as a quit.

3. *Hourly rate of pay*: Wage information is available for respondent who were working at the time of the interview. Wages are deflated to 1982-84 dollars using the CPI-U. To reduce the influence of measurement error and outliers, wage rates are set to missing when they are less than $1.5. For wage change specifications wages that are more than 800% or less than $1/8^{th}$ of the previous year's value are dropped as well.
4. 0-1 indicators for union membership and government employment.
5. *Industry and Occupation*: Industry is classified into 13 categories. Occupation is classified into 17 fields.
6. *Hours Constraints*: We construct the variable for overemployment and underemployment following Altonji and Paxson (1988, page 263, fn 7).

Demographic Variables:

1. *Marital status*: 0-1 indicator for married/married spouse absent/partnered and separated/divorced/widowed/never married.
2. *Race*: Separate 0-1 indicators for black and nonwhite/nonblack. The excluded category is white.
3. *Education*: 0-16 (fourth year college), 17 (at least some graduate work).
4. *Health limitation*: 0-1 indicator for whether an impairment or health problem that limits the kind or amount of paid work for the respondent.
5. *Region of current residence*: Separate 0-1 indicators for northeast, midwest, and west. The excluded category is south.

Proportion Female in an Occupation

Proportion female in an occupation is computed from the three digit occupation code in the Public Use Microdata 5-Percent Samples of the 1980 and 1990 US Censuses of Population. We match the proportion female to individuals on the basis of their recorded occupation in two ways. The first is to assign proportion female of an occupation to the worker's reported occupation using the 1980 Census. The second is to use a linear interpolation using the proportion female based on the 1980 and 1990 Censuses and the year of the survey.

Occupational Characteristics

The Dictionary of Occupational Titles (DOT) has the following information on occupational characteristics. General education development, which is measured by reasoning, math, language, and specific vocational preparation (SVP). Aptitudes are in 11 fields: general learning, verbal, numerical, spatial, form perception, clerical perception, motor coordination, finger dexterity, manual dexterity, eye-hand coordination, and color discrimination. Physical demands are in 20 fields: strength, climbing, balancing, stooping, kneeling, crouching, crawling, reaching, handling, fingering, feeling, talking, hearing, tasting/smelling, near acuity, far acuity, depth perception, accommodation, color vision, and field of vision. Environmental conditions are in 14 fields: weather, cold, hot, wet/humid, noise, vibration, atmospheric condition, move mechanic parts, electric shock, high exp. places, radiation, explosives, toxic caustic chemicals, and other environmental conditions.

Figure 1: Distribution of Vacation Weeks for Men

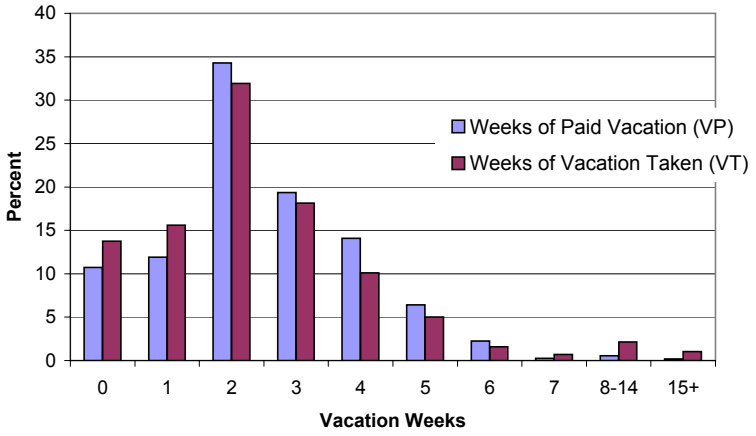


Figure 2: Distribution of Vacation Weeks for Women

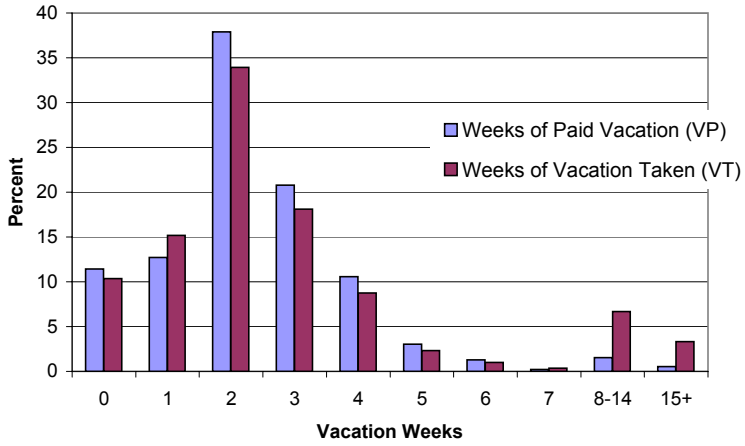
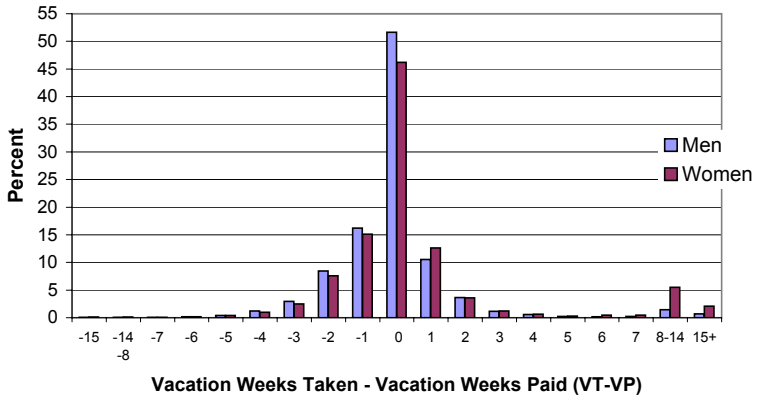


Figure 3: Distribution of Vacation Weeks Taken - Vacation Weeks Paid



Notes: The sample contains individuals who work 35 or more hours per week in their main job, were between age 19 to 59, had left school and not returned, had not retired, and were not self-employed. It also restricts to persons who have at least .5 years of seniority at the time of the survey and exclude observations if the job ended prior to the next interview.

Table 1
The Effect of Vacation Weeks Paid on Vacation Weeks Taken

Estimation Method		*Control Variables* None (1)	None (2)	Add Demographic Variables (3)	Add Demographic Variables (4)	Add Tenure, Union and Government (5)	Add Tenure, Union and Government (6)
OLS	VP	0.467	0.799	0.329	0.671	0.105	0.430
		(0.019)	(0.023)	(0.020)	(0.024)	(0.022)	(0.027)
	1(VP > 0)		-2.800		-2.623		-2.153
			(0.110)		(0.108)		(0.109)
2 Step. Use lagged VP to predict VP	VP	0.521	1.098	0.358	1.037	0.100	0.979
		(0.024)	(0.034)	(0.028)	(0.040)	(0.034)	(0.052)
	1(VP > 0)		-3.153		-3.138		-3.023
			(0.156)		(0.157)		(0.173)
IV, tenure used as Instruments	VP	0.846	0.985	1.067	1.278		
		(0.041)	(0.045)	(0.054)	(0.059)		
	1(VP > 0)		-3.310		-4.170		
			(0.152)		(0.175)		

Notes: The top panel reports OLS estimates. The second panel uses a two step estimator in which weeks of paid vacation are predicted using weeks of paid vacation in the previous year and the other controls in the model. The third panel uses an IV estimator with a cubic in tenure as the excluded instrumental variables. The column headings identify the controls. Column 1 includes only an intercept. Column 2 includes an intercept and an indicator equal to 1 if a worker receives paid vacation. Column 3 includes a set of demographic characteristics: education, experience (a quartic and an interaction between education and experience), dummies for sex, marital status, residence in SMSA, residence in city more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. Column 4 adds the indicator for $VP > 0$. Column 5 includes a set of demographic characteritics, tenure (a cubic), and dummies for union membership and government employment. Column 6 adds the indicator for $VP > 0$.
When $\mathbf{1}(VP_t > 0)$ is included as a control in the two step estimation (columns 2, 4, and 6), the regression in the first step controls for $\mathbf{1}(VP_t > 0)$ and $\mathbf{1}(VP_{t-1} > 0)$. The sample size for the OLS and IV estimates is 10,752. The sample sizes for the two step estimates are 3,795 in the first step and 8,821 (3,788) in the second step when $\mathbf{1}(VP_t > 0)$ is (not) controlled for. The sample contains individuals who work 35 or more hours per week in their main job, were between age 19 to 59, had left school and not returned, had not retired, and were not self-employed. It also restricts to persons who have at least .5 years of seniority at the time of the survey and exclude observations if the job ended prior to the next interview. Standard errors are in parentheses.

Table 2
The Effect of Vacation Weeks Taken and Weeks of Paid Vacation on Hours Measures

	Weeks Worked, Main Job	Hours / Week, Main Job	Overtime hours, Main Job	Annual Hours Worked, Main Job	Annual Hours Worked, Extra Jobs	Annual Hours Worked, All Jobs
	Effect of Vacation Weeks Taken (VT) on Hours Measures					
Controls	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
1. None	-1.029	-0.084	-0.588	-54.451	3.992	-44.259
	(0.012)	(0.017)	(0.327)	(1.200)	(0.633)	(1.098)
2. Add Demographic	-1.088	-0.195	0.697	-60.037	3.644	-51.617
Variables	(0.012)	(0.017)	(0.353)	(1.231)	(0.682)	(1.131)
3. Add Tenure, Union and	-1.047	-0.067	-0.055	-52.670	3.166	-45.309
Government	(0.013)	(0.019)	(0.380)	(1.316)	(0.735)	(1.214)
N	55506	55611	30157	33727	33727	55611
	Effect of Weeks of Paid Vacation (VP) on Hours Measures					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
1. None	-0.054	-0.004	2.397	9.866	-1.277	0.396
	(0.035)	(0.048)	(1.218)	(4.682)	(2.386)	(3.162)
2. Add Demographic	0.015	-0.116	3.045	9.397	-4.458	-7.031
Variables	(0.038)	(0.051)	(1.298)	(4.747)	(2.532)	(3.299)
3. Add Tenure, Union and	0.273	-0.048	3.013	29.168	-6.549	8.789
Government	(0.042)	(0.055)	(1.416)	(5.072)	(2.759)	(3.632)
N	10761	10769	3500	3500	3500	10769

Table 2a
The Effect of Weeks of Paid Vacation on Hours Measures
Controls: Demographic Variables

			OLS: Regression Coefficient (Standard Error)			
Vacation Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Paid Vacation (VP)	-0.626	-0.011	1.881	-4.309	2.471	-24.542
	(0.046)	(0.061)	(1.588)	(5.796)	(3.093)	(4.026)
1(VP > 0)	4.918	-1.472	9.766	115.147	-58.120	134.793
	(0.202)	(0.270)	(7.683)	(28.038)	(14.961)	(17.795)
N	10761	10769	3500	3500	3500	10769
	IV using Tenure, Tenure^2, and Tenure^3 as Excluded Instruments: Regression Coefficient (Standard Error)					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Paid Vacation (VP)	-1.095	-0.298	-0.351	-79.573	-2.375	-60.769
	(0.108)	(0.143)	(3.962)	(14.800)	(7.716)	(9.479)
1(VP > 0)	6.115	-0.741	15.988	324.983	-44.610	227.065
	(0.321)	(0.426)	(12.707)	(47.467)	(24.746)	(28.214)
N	10761	10769	3500	3500	3500	10769

Notes: Each Panel of Table 2 reports three specifications. The first specification includes only an intercept. The second specification contains a set of demographic characteristics. These consist of education, experience (a cubic and an interaction between education and experience), dummies for sex, marital status, residence in SMSA, residence in city more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. The third specification adds seniority (a cubic) and dummies for union membership and government employment. The top panel of Table 2a reports OLS estimates of the effects of paid vacation and an indicator equal to 1 if paid vacation is greater than zero. The equations include the demographic controls used in specification 2 of Table 2. The bottom panel of Table 2a reports IV estimates, with weeks of paid vacation treated as endogenous and the **1**(VP > 0) treated as exogenous and the tenure variables as the excluded instruments. We have fewer observations for columns 3-5 because only observations from year 1984 are available.

Table 3
Personal Characteristics and Vacation Time

	Dependent variables					
Variable	**Vacation Taken (VT) (1)**	**Vacation Paid (VP) (2)**	**Taken-Paid (VT-VP) (3)**	**Vacation Taken (VT) (4)**	**Vacation Paid (VP) (5)**	**Taken-Paid (VT-VP) (6)**
Female	0.973	0.070	0.902	1.043	0.123	0.920
	(0.072)	(0.043)	(0.076)	(0.071)	(0.041)	(0.077)
Education	0.494	0.193	0.301	0.454	0.175	0.279
	(0.023)	(0.014)	(0.024)	(0.023)	(0.013)	(0.025)
Marital Status	0.276	0.066	0.209	0.223	0.019	0.204
	(0.077)	(0.046)	(0.081)	(0.074)	(0.043)	(0.081)
Disability Status	-0.344	-0.019	-0.325	-0.366	-0.030	-0.336
	(0.117)	(0.070)	(0.123)	(0.112)	(0.065)	(0.123)
Black	-0.154	-0.185	0.031	-0.300	-0.255	-0.045
	(0.071)	(0.043)	(0.075)	(0.069)	(0.040)	(0.076)
Non white, Non black	-0.188	-0.415	0.226	-0.084	-0.320	0.236
	(0.195)	(0.116)	(0.205)	(0.188)	(0.109)	(0.205)
Residence in SMSA	-0.009	0.257	-0.266	-0.067	0.199	-0.266
	(0.069)	(0.041)	(0.073)	(0.067)	(0.039)	(0.073)
Union Membership				0.487	0.183	0.304
				(0.064)	(0.037)	(0.070)
Government Employment				1.202	0.681	0.521
				(0.065)	(0.038)	(0.072)
Control for Tenure	No	No	No	Yes	Yes	Yes
Adjusted R^2	0.108	0.126	0.042	0.175	0.238	0.049
N	10752	10752	10752	10752	10752	10752

Notes: All models control for experience (a cubic and an interaction between education and experience), dummy variables for residence in SMSA, residence in a city with more than 500,000 people, 3 regions, and 3 calendar year. Columns 4-6 also include tenure (a cubic), dummies for union membership and government employment. The sample selection criteria are described in the note to table 1. Standard errors are in parentheses.

Table 4
The Effect of Weeks of Paid Vacation on the Log of the Hourly Wage

	Sample								
	Hourly and Salary			**Hourly Only**			**Salary Only**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
VP	0.068	0.054		0.095	0.077		0.038	0.027	
	(0.003)	(0.003)		(0.004)	(0.005)		(0.004)	(0.005)	
1(VP > 0)	-0.061	-0.049		-0.138	-0.134		0.088	0.111	
	(0.013)	(0.013)		(0.016)	(0.015)		(0.023)	(0.024)	
VP=0			-0.067			-0.031			-0.156
			(0.011)			(0.013)			(0.020)
VP=1			-0.125			-0.110			-0.158
			(0.011)			(0.012)			(0.023)
VP=3			0.084			0.080			0.086
			(0.009)			(0.011)			(0.015)
VP=4			0.152			0.158			0.130
			(0.012)			(0.016)			(0.017)
VP=5			0.209			0.217			0.172
			(0.017)			(0.022)			(0.025)
VP=6			0.048			0.195			-0.039
			(0.023)			(0.037)			(0.031)
VP=7+			0.090			0.215			0.014
			(0.029)			(0.073)			(0.033)
Controls for tenure, union and government	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adjusted R^2	0.492	0.517	0.526	0.456	0.510	0.512	0.501	0.523	0.540
N	9500	9500	9500	5732	5732	5732	3768	3768	3768

Notes: The table reports OLS regression coefficients relating log hourly wage rate to measures of weeks of paid vacation. The wage measure is based on direct questions about rate of pay and refers to the main job at the time of the survey. In columns 1,2,4,5,7, and 8 the vacation variables are the number of weeks (VP and and indicator for VP > 0. Columns 3, 6, and 9 contain dummy variables for each number of weeks of paid vacation with VP=2 as the reference category. All models include education, a cubic in experience, education * experience, dummies for sex, marital status, residence in SMSA, residence in city more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. Column 2,3,5,6,8, and 9 also include a cubic in tenure , dummies for union membership and government employment. The sample selection criteria are described in the note to table 1. Standard errors are in parentheses.

Table 5

The Effect of Weeks of Paid Vacation on the Log of the Hourly Wage, First Difference Specification, Job Changers, HRS Sample

	Sample			
	Hourly and Salary			
	(1)	**(2)**	**(3)**	**(4)**
ΔVP	0.046	0.043		
	(0.008)	(0.008)		
Δ**1**(VP > 0)	-0.015	-0.025		
	(0.029)	(0.029)		
Quit × ΔVP			0.039	0.038
			(0.010)	(0.010)
Quit × Δ**1**(VP > 0)			-0.045	-0.059
			(0.037)	(0.038)
Layoff × ΔVP			0.051	0.046
			(0.014)	(0.014)
Layoff × Δ**1**(VP > 0)			0.0002	-0.002
			(0.045)	(0.045)
Layoff			-0.107	-0.097
			(0.022)	(0.022)
Control for occupation dummies	No	Yes	No	Yes
Adjusted R^2	0.123	0.154	0.155	0.180
N	747	747	747	747

Notes: The vacation variables are the change in the number of paid vacation weeks (ΔVP) and the change in the indicator 1(VP > 0). All models include education, a cubic in experience, education * experience, dummies for sex, marital status, and health limitation, 2 race dummies, 3 regional dummies, tenure (a cubic), dummies for union membership, government employment, and calendar years. The samples contain job changers who work 35 or more hours per week on the job in both current and previous interview years, were less than 60, had not retired, and were not self-employed. Standard errors are in parentheses.

Table 6: The Effects of Tenure and Experience on VT and VP, OLS and IV estimates

	Panel I				Panel II			
	Weeks of Vacation Taken (VT) 1975-1991				Weeks of Vacation Taken (VT) 1975-1977, 1984			
	Men		Women		Men		Women	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2 Years of Tenure	0.258	0.191	0.329	0.383	0.261	0.181	0.373	0.295
	(0.019)	(0.032)	(0.042)	(0.073)	(0.041)	(0.102)	(0.108)	(0.285)
5 Years of Tenure	0.615	0.446	0.755	0.797	0.615	0.438	0.834	0.692
	(0.037)	(0.069)	(0.080)	(0.151)	(0.080)	(0.221)	(0.205)	(0.595)
10 Years of Tenure	1.136	0.797	1.314	1.157	1.124	0.824	1.383	1.251
	(0.048)	(0.110)	(0.097)	(0.236)	(0.103)	(0.359)	(0.250)	(0.932)
20 Years of Tenure	1.996	1.306	2.062	1.313	1.971	1.407	1.932	2.104
	(0.044)	(0.180)	(0.093)	(0.411)	(0.093)	(0.584)	(0.251)	(1.579)
5 Years of Experience	-0.088	-0.167	0.230	0.143	-0.006	-0.074	0.486	0.493
	(0.040)	(0.045)	(0.084)	(0.102)	(0.086)	(0.101)	(0.209)	(0.263)
10 Years of Experience	-0.056	-0.178	0.250	0.117	-0.006	-0.094	0.504	0.518
	(0.042)	(0.053)	(0.087)	(0.119)	(0.091)	(0.108)	(0.219)	(0.286)
20 Years of Experience	0.023	-0.163	0.226	0.065	-0.050	-0.180	0.030	0.051
	(0.042)	(0.063)	(0.096)	(0.131)	(0.089)	(0.123)	(0.228)	(0.273)
30 Years of Experience	-0.076	-0.372	-0.024	-0.239	-0.198	-0.441	-0.875	-0.860
	(0.076)	(0.106)	(0.192)	(0.229)	(0.157)	(0.254)	(0.440)	(0.538)
Adjusted R^2	0.175	0.163	0.204	0.200	0.178	0.167	0.184	0.183
N	35522	35522	20089	20089	7697	7697	3055	3055

	Panel III				Panel IV			
	Weeks of Paid Vacation (VP) 1975-1977, 1984				Weeks of Vacation Taken Minus Weeks of Paid Vacation (VT-VP) 1975-1977, 1984			
	Men		Women		Men		Women	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2 Years of Tenure	0.306	0.231	0.342	0.240	-0.045	-0.050	0.031	0.055
	(0.025)	(0.063)	(0.059)	(0.156)	(0.045)	(0.112)	(0.118)	(0.312)
5 Years of Tenure	0.712	0.561	0.754	0.543	-0.097	-0.123	0.081	0.149
	(0.050)	(0.136)	(0.111)	(0.325)	(0.088)	(0.242)	(0.223)	(0.651)
10 Years of Tenure	1.273	1.071	1.221	0.905	-0.149	-0.246	0.161	0.346
	(0.064)	(0.221)	(0.136)	(0.510)	(0.113)	(0.393)	(0.273)	(1.021)
20 Years of Tenure	2.129	1.982	1.697	1.149	-0.158	-0.575	0.235	0.954
	(0.058)	(0.361)	(0.136)	(0.863)	(0.102)	(0.640)	(0.274)	(1.728)
5 Years of Experience	-0.055	-0.080	0.025	-0.041	0.049	0.005	0.461	0.533
	(0.054)	(0.063)	(0.114)	(0.144)	(0.095)	(0.111)	(0.228)	(0.288)
10 Years of Experience	-0.056	-0.079	0.016	-0.069	0.050	-0.015	0.488	0.587
	(0.056)	(0.067)	(0.119)	(0.157)	(0.099)	(0.118)	(0.239)	(0.314)
20 Years of Experience	0.033	0.022	-0.012	-0.083	-0.083	-0.202	0.043	0.135
	(0.055)	(0.076)	(0.124)	(0.149)	(0.098)	(0.135)	(0.249)	(0.299)
30 Years of Experience	0.043	0.003	0.004	-0.101	-0.241	-0.444	-0.879	-0.760
	(0.098)	(0.157)	(0.239)	(0.294)	(0.172)	(0.278)	(0.480)	(0.589)
Adjusted R^2	0.306	0.305	0.127	0.118	0.022	0.011	0.082	0.077
N	7697	7697	3055	3055	7697	7697	3055	3055

Notes: All models control for education, a quartic in experience, education * experience, a cubic in seniority, dummies for sex, marital status, union membership, government employment, residence in SMSA, residence in city more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. The IV results in columns 2 and 4 treat both the time trend and the tenure variables as endogenous and are based on Altonji and Shakotko's (1987) methodology. The deviation of the tenure variables from their job means are used as instruments, along with the deviation of time from its mean for each individual. The sample selection criteria are described in the note to table 1. Standard errors are in parentheses.

Table 7:

Average paid holidays and days of paid vacation and paid sick leave, full-time employees in medium and large private establishments, 1997

Leave category	All employees	Professional, technical, and related employees(1)	Clerical and sales employees(2)	Blue-collar and service employees(3)
Paid holidays	9.3	9.6	8.8	9.4
Paid vacation days after specified years of service:(4)				
1 year	9.6	12.4	9.9	7.9
3 years	11.5	13.3	11.4	10.5
5 years	13.8	16.0	14.2	12.4
10 years	16.9	18.9	17.0	15.6
15 years	18.8	20.7	19.4	17.4
20 years	20.3	21.9	20.5	19.2
25 years	21.5	23.1	21.7	20.3
30 years	21.7	23.4	22.0	20.6
Paid sick leave days after specified years of service:(4)				
1 year	11.2	13.3	10.1	9.9
3 years	13.0	16.1	12.1	10.4
5 years	15.2	19.3	14.5	11.5
10 years	17.6	22.6	17.3	12.6
15 years	18.8	24.7	18.1	13.2
20 years	20.5	27.3	20.2	13.6
25 years	21.1	28.0	20.8	14.1

1 Includes professional, technical, executive, and administrative occupations.
2 Includes clerical, administrative support, and sales occupations.
3 Includes production, craft, repair, laborer, and service occupations.
4 A specific number of days per year granted after completion of the indicated service or accrued during the next 12-month period.

NOTE: Computed averages exclude days at partial pay and workers in plans that do not stipulate at least 1 full day.

Source: Employee Benefits in Medium and Large Private Establishments, 1997
Bureau of Labor Statistics, USDL 99-02. http://www.bls.gov/news.release/ebs3.nws.htm, Table 4.

Table 8

The Link Across Jobs in Vacation Weeks Taken, Hours Worked Per Week and Hourly Rate of Pay

Effects of Vacation on Previous Job on Vacation in New Job

	All Job Changers			Quits			Layoffs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Avg. of Vacation Taken in last two years	0.216 (0.056)	0.094 (0.057)	0.076 (0.056)	0.282 (0.072)	0.150 (0.078)	0.086 (0.075)	0.291 (0.088)	0.176 (0.090)	0.224 (0.086)
Occupation Index	No	No	0.647 (0.079)	No	No	0.627 (0.086)	No	No	1.427 (0.278)
Occupation Dummies	No	Yes	No	No	Yes	No	No	Yes	No
Adjusted R^2	0.113	0.158	0.158	0.131	0.195	0.189	0.114	0.175	0.181
N	1235	1235	1235	770	770	770	347	347	347

Effects of Hours Worked Per Week on Previous Job on Hours Worked Per Week in New Job

	All Job Changers			Quits			Layoffs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Avg. of Hours/Week in last two years	0.312 (0.028)	0.263 (0.031)	0.264 (0.031)	0.329 (0.043)	0.297 (0.047)	0.296 (0.046)	0.383 (0.051)	0.305 (0.059)	0.316 (0.055)
Occupation Index	No	No	0.447 (0.107)	No	No	0.281 (0.158)	No	No	0.599 (0.204)
Occupation Dummies	No	Yes	No	No	Yes	No	No	Yes	No
Adjusted R^2	0.174	0.200	0.185	0.146	0.157	0.149	0.209	0.232	0.228
N	1287	1287	1287	776	776	776	350	350	350

Effects of Hourly Rate of Pay on Previous Job on Hourly Rate of Pay in New Job

	All Job Changers			Quits			Layoffs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Avg. of Log Wage in last two years	0.682 (0.028)	0.668 (0.028)	0.629 (0.029)	0.700 (0.035)	0.689 (0.036)	0.649 (0.036)	0.653 (0.054)	0.654 (0.057)	0.595 (0.056)
Occupation Index	No	No	0.453 (0.075)	No	No	0.413 (0.095)	No	No	0.478 (0.146)
Occupation Dummies	No	Yes	No	No	Yes	No	No	Yes	No
Adjusted R^2	0.667	0.695	0.677	0.685	0.717	0.694	0.648	0.692	0.661
N	1078	1078	1078	636	636	636	303	303	303

Notes: Two specifications are used to control for the occupation of the previous job. The first specification includes 27 occupation dummies, including a dummy for missing data on occupation. Occupation index is based on the coefficients on the occupation dummies in a cross section regression for vacation weeks taken (VT) on which are obtained from a cross sectional regression, as a variable to control for occupation. Sample sizes for the cross section regression are 51,835, 51,942 and 47,733 for vacation time, hours worked per week, and hourly rate of pay, respectively. All models control for education, experience (a cubic and an interaction between education and experience), seniority (cubic), and dummies for sex, marital status, union membership, government employment, residence in SMSA, residence in city more than 500,000 people, disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. The sample selection criteria are described in the note to table 1. Standard errors are in parentheses.

Table 9

The Link between Vacation Weeks Paid Across Jobs

The Effect of Paid Vacation on Previous Job on Paid Vacation in New Job

Sample: All Job Changers

	(1)	(2)	(3)	(4)	(5)	(6)
Paid Vacation in last year	0.121	0.010	0.072			
	(0.058)	(0.058)	(0.058)			
Avg. of Paid Vacation in last two years				0.338	0.251	0.263
				(0.093)	(0.106)	(0.098)
Occupation Index	No	No	1.008	No	No	0.817
			(0.265)			(0.377)
Occupation Dummies	No	Yes	No	No	Yes	No
Adjusted R^2	0.221	0.330	0.257	0.316	0.373	0.334
N	302	302	302	158	158	158

Notes: Two specifications are used to control for the occupation of the previous job. The first specification includes 27 occupation dummies, with missing occupation treated as a seperate category. The second specification (occupation index) uses coefficients on occupation dummies, which are obtained from a cross sectional regression (N=9,657), as a more parsimonious control for aspects of occupation of the previous job that are related to vacation. All models control for education, a cubic in experience, education * experience), a cubic in seniority, dummies for sex, marital status, union membership, government employment, residence in SMSA, residence in city more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. The sample selection criteria are described in the note to table 1. Standard errors are in parentheses.

Table 10
The Effects of Occupation on Vacation Weeks Taken, Vacation Weeks Paid, and Vacation Weeks Taken - Vacation Weeks Paid

	Vacation Taken (VT)		Paid Vacation (VP)		Vacation Taken - Paid Vacation (VT-VP)	
Variable	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.
Physician, Dentist	0.213	0.268	0.784	0.386	-0.148	0.669
Other Medical & Paramedical	0.423	0.101	0.994	0.160	-0.590	0.276
Accountant & Auditor	-0.055	0.110	0.261	0.162	-0.047	0.281
Teacher K12	7.436	0.075	0.548	0.110	7.727	0.191
Teacher College, Librarian	2.613	0.113	0.255	0.182	2.574	0.315
Architects, Physical & Biological	0.014	0.079	0.245	0.111	-0.060	0.192
Technician	0.134	0.064	0.466	0.098	-0.325	0.170
Public Advisor	-0.223	0.091	0.370	0.137	-0.461	0.237
Judge, Lawyer	-0.485	0.171	0.565	0.290	-0.786	0.501
Other Professional	1.544	0.143	0.182	0.213	1.597	0.369
Manager, Official & Proprietor (not self)	-0.059	0.050	0.273	0.073	-0.216	0.126
Manager, Official & Proprietor (self-emp)	0.639	0.631	-0.955	1.136	-0.211	1.967
Secretary, Typists	-0.053	0.069	0.203	0.105	-0.348	0.182
Other Clerical Workers	0.146	0.047	0.314	0.066	-0.064	0.114
Retail Store Salesman & Sales Clerk	-0.148	0.071	-0.150	0.101	0.133	0.175
Craftsmen, Foreman	0.093	0.082	0.356	0.109	-0.116	0.188
Other Craftsmen	-0.145	0.045	-0.225	0.060	0.119	0.105
Government Protective Service Worker	0.087	0.097	0.319	0.139	-0.011	0.240
Armed Force	0.426	0.099	2.418	0.138	-1.865	0.239
Transport Equipment Operative	-0.042	0.059	0.042	0.080	-0.005	0.138
Unskilled Laborer	-0.374	0.064	-0.302	0.084	0.084	0.146
Farm Laborer & Foreman	-0.417	0.130	-1.065	0.161	1.119	0.280
Private Household Worker	-0.773	0.217	-1.131	0.293	-0.014	0.508
Other Service Worker	-0.011	0.051	-0.078	0.071	0.243	0.123
Farmers & Manager	0.147	0.352	-0.882	0.509	1.401	0.882
Adjusted R^2	0.352		0.273		0.236	
N	55182		10386		10386	

Notes: The reference category for the occupational dummies is operatives, except transport. All models control for education, a cubic in experience, education * experience), a cubic in seniority, dummies for sex, marital status, union membership, government employment, residence in SMSA, residence in a city of more than 500,000 people, and disability status, 2 race dummies, 3 regional dummies, and calendar year dummies. The sample selection criteria of the data are described in the note to table 1.

Appendix:

Figure A1: Distribution of Vacation Weeks for Part Time Men

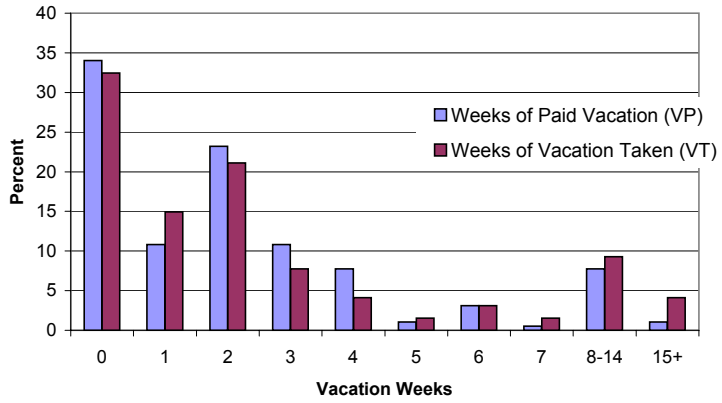


Figure A2: Distribution of Vacation Weeks for Part Time Women

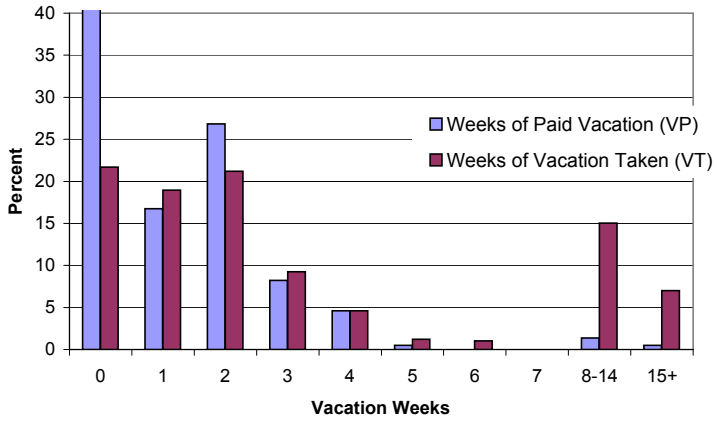
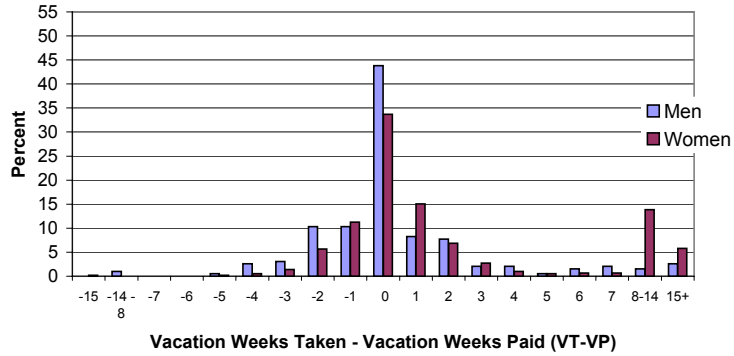
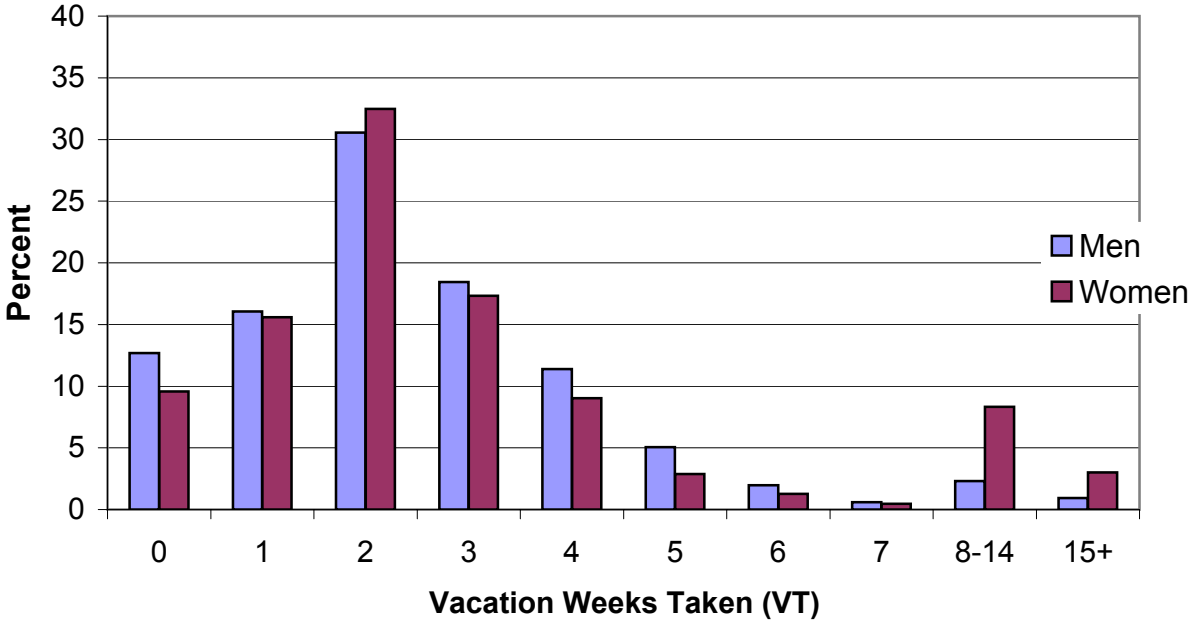


Figure A3: Distribution of Vacation Weeks Taken - Vacation Weeks Paid, Part Time



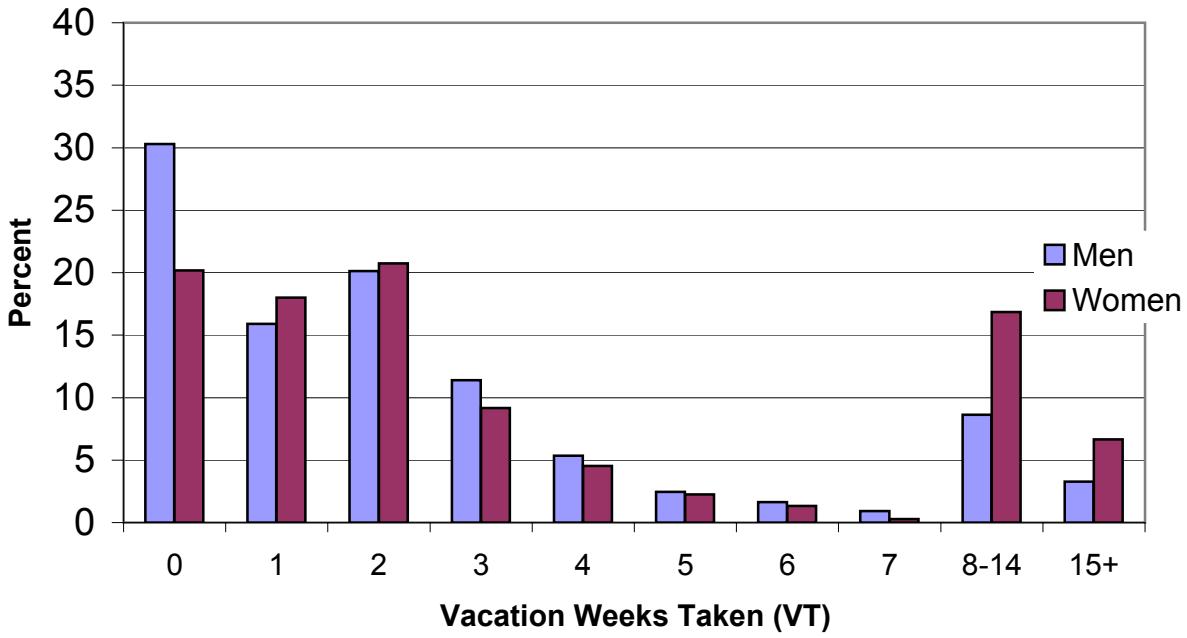
Note: The sample contains individuals who work between 15 and 34 hours per week in their main job. The other restrictions are same as in the note to Figures 1, 2 and 3. That is, individuals were between age 19 to 59, had left school and not returned, had not retired, and were not self-employed. It also restricts to persons who have at least .5 years of seniority at the time of the survey and exclude observations if the job ended prior to the next interview.

Figure A4: Distribution of Vacation Weeks Taken 1975-1991



Notes: We use all the years available from the PSID. The sample design is the same as in the note to Figures 1, 2 and 3.

Figure A5: Distribution of Vacation Weeks Taken 1975-1991, Part Time Workers



Note: The sample contains individuals who work between 15 and 34 hours per week in their main job. We use all the years available from the PSID. The sample selection criteria are the same as Figures 4, 5 and 6, except that we use years 1975-1991.

Appendix Table A1
Means of Selected Variables in the Panel Study of Income Dynamics (PSID)

	Values of VP					
	Men			**Women**		
Variable	**VP = 0**	**VP > 0**	**All**	**VP = 0**	**VP > 0**	**All**
Weeks of Vacation Taken (VT)	2.386	2.581	2.560	5.547	3.021	3.310
Weeks of Paid Vacation (VP)	0.000	2.818	2.516	0.000	2.765	2.450
Marital Status	0.846	0.888	0.884	0.542	0.494	0.499
Age	35.47	36.51	36.40	37.13	36.60	36.66
Education	11.14	12.22	12.10	12.52	12.29	12.32
Experience	16.48	17.59	17.48	14.24	14.58	14.54
Tenure	6.439	9.311	9.003	6.063	6.832	6.745
Wage	9.352	11.18	10.99	6.772	8.023	7.891
Government Employment	0.178	0.230	0.224	0.421	0.284	0.299
Union	0.248	0.344	0.334	0.092	0.160	0.152
Proportion Female	0.196	0.211	0.209	0.680	0.661	0.663
Teacher	0.071	0.014	0.020	0.258	0.045	0.069
Black	0.389	0.281	0.293	0.467	0.415	0.421
Nonblack/Nonwhite	0.046	0.023	0.025	0.017	0.016	0.016
Disability	0.062	0.063	0.063	0.069	0.064	0.064
SMSA	0.526	0.673	0.657	0.602	0.713	0.700
Large City	0.237	0.306	0.298	0.218	0.342	0.328
Northeast	0.104	0.169	0.162	0.103	0.161	0.154
North Central	0.201	0.266	0.259	0.183	0.221	0.217
West	0.149	0.153	0.153	0.095	0.157	0.150
South	0.545	0.410	0.425	0.616	0.459	0.477
Overemployment	0.027	0.047	0.045	0.032	0.044	0.043
Underemployment	0.374	0.263	0.275	0.209	0.162	0.167
Reasoning	3.202	3.478	3.448	3.555	3.467	3.477
Math	2.255	2.628	2.588	2.554	2.509	2.514
Language	2.588	2.898	2.865	3.149	3.029	3.043
SVP	4.788	5.273	5.222	5.032	4.904	4.918
Strength	1.843	1.363	1.415	1.144	0.934	0.957
Climbing	0.547	0.265	0.295	0.081	0.074	0.074
Balancing	0.361	0.161	0.183	0.073	0.055	0.057
Stooping	0.905	0.532	0.571	0.522	0.383	0.398
Kneeling	0.643	0.286	0.324	0.186	0.137	0.143
Crouching	0.727	0.361	0.400	0.193	0.195	0.195
Crawling	0.118	0.058	0.065	0.011	0.012	0.012
Reaching	1.929	1.910	1.912	1.780	1.911	1.896
Handling	1.946	1.926	1.929	1.812	1.933	1.919
Fingering	1.315	1.425	1.414	1.442	1.606	1.587
Feeling	0.145	0.141	0.141	0.200	0.181	0.183
Talking	0.818	0.970	0.954	1.528	1.289	1.316
Hearing	0.956	1.045	1.035	1.579	1.338	1.365
Weather	1.055	0.496	0.556	0.128	0.114	0.116
Wet/humid	0.128	0.101	0.104	0.101	0.109	0.108
Noise	3.485	3.304	3.323	3.040	2.962	2.971
Atmospheric condition	0.435	0.182	0.209	0.038	0.045	0.044
Vibration	0.026	0.010	0.012	0.002	0.002	0.002

Note: The numbers in the table are means of the row variables conditional on column segments on VP. These are calculated across individuals between 1975-1991. The sample selection criteria are described in the note to table 1.

Appendix Table A1 contd.

Means of Selected Variables in the Health and Retirement Study (HRS)

	Values of VP					
	Men			**Women**		
Variable	**VP = 0**	**VP > 0**	**All**	**VP = 0**	**VP > 0**	**All**
Weeks of Paid Vacation (VP)	0.000	3.669	3.259	0.000	3.560	3.114
Marital Status	0.828	0.884	0.878	0.768	0.734	0.738
Age	55.05	55.31	55.28	53.51	53.31	53.34
Education	11.87	12.88	12.77	12.98	13.00	13.00
Experience	34.42	35.66	35.52	26.60	28.77	28.50
Tenure	9.828	16.13	15.43	10.16	12.46	12.17
Wage	10.54	12.03	11.86	8.465	9.858	9.688
Hours/Week	46.02	45.71	45.75	43.32	41.98	42.15
Weeks Worked (counting VP)	45.99	51.53	50.92	43.93	51.10	50.22
Paid Sick Days	1.931	9.610	8.475	4.475	9.848	9.031
Days Missed due to Illness	0.636	0.971	0.934	0.657	1.074	1.021
Government Employment	0.011	0.073	0.066	0.027	0.072	0.066
Union	0.285	0.319	0.315	0.259	0.218	0.223
Black	0.125	0.124	0.124	0.149	0.190	0.185
Nonblack/Nonwhite	0.053	0.043	0.044	0.044	0.039	0.040
Health Limitation	0.092	0.073	0.075	0.087	0.065	0.068
Northeast	0.144	0.167	0.165	0.114	0.180	0.172
Midwest	0.230	0.257	0.254	0.238	0.240	0.240
West	0.170	0.160	0.161	0.162	0.141	0.143
South	0.455	0.415	0.420	0.485	0.440	0.445
Overemployment	0.091	0.134	0.129	0.081	0.190	0.176
Underemployment	0.162	0.138	0.141	0.157	0.129	0.132

Note: The numbers in the table are means of the row variables conditional on column segments on VP. These are calculated across individuals between 1992, 1994, 1996, 1998, 2000, and 2002. The sample selection criteria are described

Appendix Table A2

Means of Vacation Weeks Taken, Weeks Worked on Main Job, Hours/week on Main Job, Annual Hours Worked on Extra Jobs, and Annual Hours Worked on All Jobs by Weeks of Paid Vacation

Men

Weeks Paid Vacation (VP)	(1) Vacation Weeks Taken (VT)	(2) Weeks Worked, Main Job	(3) Hours / Week, Main Job	(4) Overtime Hours, Main Job	(5) Annual Hours Worked, Main Job	(6) Annual Hours Worked, Extra Jobs	(7) Annual Hours Worked, All Jobs
0	2.39	44.88	46.30	23.98	2128.24	143.37	2190.50
1	1.38	48.39	44.47	48.43	2135.32	54.50	2262.96
2	1.94	48.26	44.43	42.58	2173.64	63.40	2259.88
3	2.77	47.55	43.92	54.63	2135.70	58.90	2205.63
4	3.44	47.08	44.27	47.17	2065.48	87.33	2199.50
5	4.48	46.09	44.05	55.05	2075.55	39.36	2144.56
6	3.89	46.90	47.17	39.36	2324.01	83.37	2354.32
7+	8.20	41.05	46.99	49.14	1852.62	158.05	2104.56
Total	2.56	47.37	44.58	45.36	2135.06	74.25	2226.99

Women

Weeks Paid Vacation (VP)	(1) Vacation Weeks Taken (VT)	(2) Weeks Worked, Main Job	(3) Hours / Week, Main Job	(4) Overtime Hours, Main Job	(5) Annual Hours Worked, Main Job	(6) Annual Hours Worked, Extra Jobs	(7) Annual Hours Worked, All Jobs
0	5.55	42.48	40.42	25.56	1703.62	47.76	1781.08
1	2.08	47.08	40.61	24.45	1898.92	39.65	1953.05
2	2.41	47.22	40.54	30.72	1937.41	22.88	1961.63
3	3.35	46.33	40.31	25.41	1890.47	29.96	1915.13
4	3.66	46.04	40.89	31.93	1904.24	41.39	1941.70
5	3.78	46.16	40.77	26.25	1881.83	28.83	1959.43
6	4.31	45.69	42.13	26.52	1990.32	70.00	1998.92
7+	10.64	40.16	42.29	31.68	1794.37	61.37	1740.30
Total	3.31	46.14	40.59	28.06	1888.57	33.50	1923.53

Notes: The numbers in the table are means of the column variable conditional on the row value of weeks of paid vacation. The number of observations for men (women) are 7,697 (3,055) for vacation weeks taken, 7,702 (3,059) for weeks worked on main job, 7,708 (3,061) for hours per week on main job and hours worked on all jobs, 2,093 (1,407) for overtime hours, annual hours worked on main job, and annual hours worked on extra jobs. We have fewer observations for columns 4-6 because only observations from year 1984 are available.

Appendix Table A3
The Effect of Weeks of Paid Vacation on the log of the Hourly Wage: HRS

Men and Women	*Sample*								
	Hourly and Salary			**Hourly Only**			**Salary Only**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
VP	0.101	0.064		0.110	0.062		0.075	0.048	
	(0.002)	(0.003)		(0.003)	(0.004)		(0.004)	(0.004)	
1(VP > 0)	-0.189	-0.094		-0.154	-0.061		-0.171	-0.070	
	(0.013)	(0.014)		(0.015)	(0.015)		(0.023)	(0.024)	
VP=0			-0.023			-0.078			0.026
			(0.012)			(0.013)			(0.021)
VP=1			-0.145			-0.122			-0.188
			(0.014)			(0.014)			(0.030)
VP=3			0.118			0.069			0.156
			(0.010)			(0.012)			(0.016)
VP=4			0.191			0.132			0.216
			(0.011)			(0.014)			(0.017)
VP=5			0.264			0.184			0.320
			(0.013)			(0.017)			(0.020)
VP=6			0.320			0.266			0.313
			(0.019)			(0.026)			(0.026)
VP=7+			0.132			0.151			0.064
			(0.019)			(0.031)			(0.025)
Controls for tenure, union and government	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adjusted R^2	0.445	0.467	0.477	0.384	0.428	0.431	0.382	0.401	0.425
N	15454	15454	15454	8393	8393	8393	7061	7061	7061

Notes: The table reports OLS regression coefficients relating log hourly wage rate to measures of weeks of paid vacation. In columns 1,2,4,5,7, and 8 the vacation variables are the number of weeks (VP and and indicator for VP > 0. Columns 3, 6, and 9 contain dummy variables for each number of weeks of paid vacation with VP=2 as the reference category. All models include education, experience (a cubic and an interaction between education and experience), dummies for sex, marital status, and health limitation, 2 race dummies, 3 regional dummies, and calendar year dummies. Column 2,3,5,6,8, and 9 also tenure (a cubic), dummies for union membership and government employment. The sample contains individuals who work 35 or more hours per week on the job, were less than age 60, had not retired, and were not self-employed.