The Dynamics of Jobholding among Contingent Workers and the Effect on Family Earnings

by

Leslie R. Wallace
Department of Economics
University of California, San Diego
La Jolla, California

December 2007

Introduction

Current research on the dynamics of jobholding shows that job stability in the United States has remained fairly constant, that long-term relationships with employers are fairly common, and that the probability of job separation falls as work tenure with a firm increases.[1] These observed regularities call into question the perception that regular, full-time jobs are being supplanted by contingent jobs, but do beg the question as to the role of temporary and contract jobs in the dynamic labor supply choices of workers. In this paper I examine the effect of a change in work status, from regular, full-time employment to contingent employment, on family earnings. I also look specifically at the behavioral response by the spouse to this change in work status. The motivation for this paper arises from the fact that it is not known whether contingent work has a detrimental effect on family earnings. Anecdotal evidence suggests that economic uncertainty stemming from such factors as earnings variability, lack of benefits (e.g. health and retirement), and variability of employment contracts, assumed to be inherent in contingent work, lead to economic instability. In fact, a higher proportion of families of respondents who are contingent workers are living below the annual poverty level.[2] More specifically, families in which the respondent worked as a contingent worker were twice as likely to be found in poverty as families of respondents who worked on a regular basis.[3] In the next section, I synthesize the findings from research as to the motivations

[1] Schmidt and Svorny (1998), Farber (1998), Diebold, Neumark, and Polsky (1997). Note that the empirical regularity regarding the probability of separations falling as tenure increases could reflect either a genuine "tenure effect" or simply heterogeneity, with those most prone to leave doing so before they have built up much tenure.

[2] See U.S. Census Bureau for the annual poverty rate. Website source used is the U.S. Census Bureau http://www.census.gov/hhes/poverty/histpov/hstpov1.html . Refer to appendix table 3.

[3] I use the weighted average poverty thresholds for a 2 person household (age less than 65 years) for the years 1993, 1995, and 1997; the earnings levels are $9,728, $10,259, and $10,805 respectively. Refer to appendix table 2.

for why workers choose contingent work and the subsequent outcomes of their employment choice.

Literature Review

Farber (1999), Houseman and Polivka (1998), Rothstein (1996) and Ferber and Waldfogel (1998) focus on the labor market experiences of *individual workers* over time in order to examine how contingent employment fits in the overall work pattern. I use the results of these papers to link the effect of contingent work for the *individual* to its impact on the *family unit*; through its impact on family earnings and work hours of spouses. Table 1 provides a summary of some of the longitudinal studies cited above[4] including the data used, period of study, sample sizes and whether wages and employment status were examined.

Farber (1999) looks at whether displaced workers become reemployed as contingent workers subsequent to a job loss. By matching the workers in the February 1994 and 1996 Current Population Surveys: Displacement Work Supplements with the 1995 and 1997 Current Population Surveys: Contingent Work Supplements respectively, he finds that job losers are more likely than non-losers to become employed as part-time, temporary, or involuntarily part-time workers. Also, he finds that the probability of being employed as a temporary worker falls with time since job displacement.[5] This supports evidence from research as to the *length or duration* of temporary employment. In another study, Lyons (1999), using data from the 1995 and 1997 Contingent Work Supplements, finds that on average temporary help workers' tenure was fewer than 6 months. In a previous study, Segal and Sullivan (1997) examine the employment duration of temporary help workers using unemployment data from the state of

[4] An exception is the paper by Segal and Sullivan (1995) which uses the broad category of personnel supply workers, SIC 736.

[5] He does not, however, examine the wage change that accompanies contingent employment.

Washington. They find that most temporary work lasts for less than a year with the average duration being about six months.

In order to determine how much employment instability accompanies contingent work, Houseman and Polivka (1998) examine the job stability and employment variability for workers in various contingent work arrangements. They use data from an Upjohn survey and exploit the longitudinal aspect of the Current Population Survey.[6] They find that agency temporaries, on call and direct-hire temporaries have the least job stability and are more likely to change employers than regular, full-time workers. They also find evidence of much job instability for part-time workers; part-time workers are more likely than regular, full-time workers to change employers, become unemployed, or drop out of the labor market.

Rothstein (1996) and Ferber and Waldfogel (1998) use data from the NLSY79. The first of the two looks at the distribution of workers among various employment arrangements. She examines whether changes in marital status, birth of a child, the number of jobs held and the percent of weeks worked over two years prior to the start of the main job affects the likelihood of being in a nonstandard job or regular job.[7] For a sample of workers possessing three years or less of tenure, she provides cross-tabulations of each of these variables of interest by employment arrangement: nonstandard and regular employment. Cross tabulations of wages and hours for jobs held in the two years before the start of the main job by employment arrangement are also provided. The data from the cross-tabulations show that changes in marital status and number of children

[6] Unpublished paper, publicly unavailable data which uses household and unique person identification numbers to match March 1995 CPS to the February 1995 Contingent Work Supplement to February 1996 CPS data.

[7] Main job is as of 1994. For definition of "nonstandard jobs," see table 1, footnote c. Regular employment includes self-employment and full-time/part-time work.

have a more pronounced effect on the probability of being in regular employment for women than for men. She finds that childbirth decreases the likelihood of women being found in regular full-time work (compared to those who have not given birth). Also for women a change in marital status (to divorced, widowed, or separated) increases the probability of their working regular, full-time than for those who remain married. And overall, women who were self-employed working part-time or as temporary agency worker show smaller wage gains compared to their full-time counterparts. For men the birth of a child has no effect on the probability of their being in regular full-time employment, and a change in marital status has no effect on the probability of their working regular, full-time compared to those who remain married. One of the persistent patterns that exists among all the variables examined in the cross-tabulations of employment arrangements by the variables of interest is that, except for contract workers and the self-employed, on average, nonstandard workers spend less time working (compared to regular full-time workers) in the 2 years prior to the main 1994 job.

For a sample of men and women, Ferber and Waldfogel (1998) examine the long-term consequences of wage growth, returns to experience, benefits and earnings of workers employed in nontraditional work.[8] In order to measure how past nontraditional work affects current earnings and benefits, they run an OLS by regressing log hourly wages on demographic variables and dummies representing the various nontraditional employment arrangements. Unfortunately, they do not include a control for whether the current job is nonstandard because of the timing of the data. Receipt of pension/health insurance is for the year prior to the survey year; in this case 1993 for the 1994 survey year. No data are collected on nonstandard work status in 1993.

[8] For definition of "nontraditional jobs," see table 1, footnote d.

For benefits, they run a probit model using the same controls with the dependent variable being health/pension receipt. Some of their results include: all other forms of nontraditional employment (with the exception of self-employment and voluntary part-time work performed by women), result in lower than average wages in the current job (held as of 1994). They also find that returns to experience are positive for the self-employed. As far as wage growth, they find lower wage growth over time associated with part-time work for both men and women and positive and negative growth associated with self-employment and temporary work respectively. In addition, the likelihood of receiving benefits is lower for both men and women who have a history of nontraditional employment.

In sum, the studies using the Current Population Survey suggest that contingent work arrangements are only temporary and those using data from the NLSY79 suggest that a history of this type of work arrangement has a long-term negative effect on wage growth.[9] Evidence from both cross-sectional and longitudinal data sets indicates that individuals engage in contingent work as a result of job loss (see Farber, 1999 and Ferber and Waldfolgel, 1998).

In this paper I provide empirical evidence to answer the question, "How is the family unit affected by the transition into a contingent work arrangement?" More specifically, I examine how family earnings and the labor response of the spouse of the contingent worker are affected by the transition into contingent employment. The NLSY79, by providing three observations on contingent/non-contingent status over six

[9] This holds true at least for those who self-identified as having worked in a temporary job or whose job was temporary because it ended when work terminated. By construction, the definition that the authors use excludes individuals who were currently temporary workers.

years, promises to yield more information than we have had available in the past about the extent to which contingent employment affects the earnings of families.

Family Household Model

Similarly to Ashenfelter and Heckman (1974), I derive the labor supply functions of the spouses from a family utility model. I define the family as an opposite sex married couple living in the same household. The family chooses composite commodity Z and leisure (L_1 and L_2) in order to maximize its utility $U(Z, L_1, L_2)$ subject to a budget constraint, $pZ = w_1H_1 + w_2H_2 + V$, and time constraints, $T-H_1=L_1$ and $T-H_2= L_2$; where T=total time available. H_1 and H_2 are hours of work; p is price of the consumption good, and w_1 and w_2 are wages. V is nonlabor income. The subscript 1 refers to spouse 1 and the subscript 2 refers to spouse 2. I combine the constraints to form the full-income constraint : $(w_1+w_2)T+V=pZ + w_1L_1 + w_2L_2$.

The Lagrangian is $L= U(Z,L_1,L_2) +\lambda[(w_1+w_2)T+V-pZ-w_1L_1-w_2L_2]$

The First-Order Conditions:

$L_z= U_z- \lambda p = 0$

$L_{L1} = U_{L1} – \lambda w_1 = 0$

$L_{L2} = U_{L2} – \lambda w_2 = 0$

$L_\lambda = w_1(T_1-L_1)+w_2(T-L_2)+V-pZ= 0$

The optimal quantities of the choice variables are: $Z_i^*(p,w_1,w_2,V)$, $L_i^*(p,w_1,w_2,V)$. Since in the empirical section I focus on married spouses who are both employed, the optimal number of hours is given by an interior solution[10], $H_i^*=T-L_i^*$; where i = 1,2. For the labor supply functions of the spouses to satisfy the optimality conditions they must satisfy the conditions of the symmetry and positive definiteness of the Slutsky matrix. In order to examine the cross wage change in labor supply I differentiate the above first-

[10] Although I focus on the subsample of employed couples, there is a larger literature that looks at joint labor supply and labor force participation.

order conditions with respect to w_1. Simplified I get the following Slutsky equation which shows the substitution and income effects of a wage change for one spouse on the labor supply of the other spouse. Holding utility constant, I derive the substitution effect. See the appendix for the explicit derivation. The Slutsky decomposition is,

$$H_{2w1} = H_{2w1}\big|_{U=\bar{U}} + H_1 H_{2V} \qquad (1)$$

where the term on the left side is the derivative of hours of work for spouse 2 with respect to changes in the wages of spouse 1. H_{2V} is the effect of nonlabor income, V, on the labor supply of spouse 2.

In equation (1) the first term of the Slusky decomposition represents the cross-substitution effect. The sign of this term can either be positive or negative depending on the functional relationship of the leisure hours of the spouses. If the leisure of spouse 1 and the leisure of spouse 2 are net complements then when the wage of spouse 1 increases then the labor supply of spouse 2 will increase and thus the term will be positive. However, if the leisure of spouse 1 and the leisure of spouse 2 are net substitutes then when the wage of spouse 1 increases the hours worked of spouse 2 will decrease and therefore this term will be negative. Under the assumption that leisure is a normal good, the second term in the Slutsky decomposition, the income effect, is negative.

I suppose that initially both spouses are employed on a regular basis and that one of the spouses becomes employed on a contingent basis. The reasons why one of the spouses accepts a contingent job are not modeled; the switch to contingent work may be

either exogenously imposed[11] or endogenously chosen[12]. Thus, if one of the spouses accepts a contingent job, (which generally offers a lower wage, lower benefits, and unstable tenure compared to the full-time job) then according to standard economic theory family income would fall as the opportunity cost of leisure has fallen; the other spouse (who is assumed to be able to adjust his employment hours) compensates by adjusting his labor supply to respond to the change in work status. Given this case, I hypothesize that the labor response of a person whose spouse has become a contingent worker is positive. Empirically this implies that the income effect outweighs the cross-substitution effect (or that the cross-substitution effect works in the same direction), (see Berndt, p. 607). In the empirical section, I formulate a model to test whether this holds.

[11] Motivations for this change in job status could come from a variety of sources; an example is local economic conditions.

[12] Alternatively, members of the household may choose jobs that are wage-hours packages. An example of such a tied wage-hour package is jobs requiring more hours paying higher wages. Thus, if say the husband is faced with a lucrative job that offers high wages but requires high hours, then his wife may optimally choose a contingent job that requires fewer hours (with lower wages) since the husband would contribute more time in the labor market.

Data

The data are from the National Longitudinal Study of Youth (NLSY), 1979-1998. The sample used in the regressions consists of working married couples living in the same household as of the 1994, 1996 and 1998 survey dates.[13] At the beginning of the NLSY survey these individuals were aged 14-21 and as of 1994 were between the ages of 29-36. Starting from 1994, the survey was administered biennially and included questions about the respondents' working status with their current employer. The intent was to distinguish the nature of the work relationship with their employer. Workers reported themselves as being in one of seven categories based on their current work arrangement: regular employee, temp worker, sent by a temporary agency; temp worker, hired directly by the company; consultant; contractor or employee of a contractor. For the purpose of this study, I first categorize workers into two groups: regular employees and contingent workers.[14] Also, the family unit is defined as married opposite sex couples living with or without blood relatives or adopted children in the same household. The sample excludes all observations that have missing data for the labor supply variables such as family earnings[15] and hours worked per week.

I examine the effects of changes in work status over the periods 1994-1998 on changes in log family earnings, log of personal earnings for the respondent and hours worked per week by the respondent's spouse. I construct a panel dataset from the NLSY

[13] The NLSY79 does not include the earnings of opposite or same sex partners in the calculation of family earnings. Partners are considered non-family members of a household for the enumeration of the constructed variable, family size.

[14] Based on the cross-tabulation of current work arrangement by year on whether self-employed using the NLSY79 data. Work arrangement is one of seven categories discussed in the paper. Results show that slightly more than half of those workers who were self-employed in the years 1994, 1996, and 1998 were classified as regular employees.

[15] Family earning is calculated as the sum of gross wages, salary, commissions, and tips, for both spouses.

1979-1998.[16] Dependent variables such as personal earnings of the respondent, total family earnings and hours worked by the respondent's spouse are surveyed and are coded as if they occurred in the even years, i.e. 1994, 1996 and 1998 although they are reported outcomes of the preceding years, i.e. 1993, 1995, and 1997. This is a timing issue to consider in the interpretation of the results; changes in the dependent variables are predicated on changes in work status.

Regression Model

In the regression models, the dependent variables are the logarithm of personal earnings, the logarithm of total family earnings, and the number of hours worked per week during the number of weeks worked by the respondent's spouse. The dependent variable, total family earnings, is the sum of the earnings for both spouses living in the same household during the time period. I estimate a fixed-effect model of the following form,

$$y_{it} = \alpha_i + \beta_1 contingent_{it} + \beta_2 health_{it} + Z^1_{it}\beta_3 + Z^2_i\beta_4 + \beta_5 V + \varepsilon_{it}$$

The *it* subscript designates variables that vary across time and individuals. y_{it} is one of the dependent variables: the log of personal earnings for the respondent, log of total family earnings or is the number of hours worked per week by the respondent's spouse. α_i, is the fixed effect which represents the individual/family heterogeneity, a component of the error term that captures the unobserved time unvarying effect between individuals/families. $Contingent_{it}$ is a dummy variable equaling one if the respondent is a

[16] These data are in wide form, i.e. observation per respondent.

contingent worker and zero otherwise. *Health* is a dummy variable that equals one if the respondent's health limits.[17] Controls included in the matrix (1) Z^1 are time-varying between individuals: regional dummies, age of the respondent and the respondent's spouse, and the level of education for the respondent and his spouse. (2) Z^2 includes controls that are time-invariant and thus are differenced out of the model: sex of the respondent, sex of the respondent's spouse, and race of the respondent. V is nonlabor income pooled by the family unit.[18] Finally, ε_{it} represent another component of the error term that captures unobserved heterogeneity across time and individuals/families.

I suspect that *contingent,* the binary variable representing the choice to work on a contingent basis, is endogenous, i.e. correlated with unobserved factors not accounted for in my model specification. Possible factors could be the unemployment rate in the respondent's region of residence, the unobserved ability of the individual respondent, and the criminality of the respondent. An increase in the unemployment rate in a region is likely to contribute to a higher incidence of contingent employment among workers in that same region as employers hire relatively fewer regular workers to contingent workers. Because of this decreased relative demand, workers faced with a pool of relatively more contingent jobs to regular jobs or the choice between working or not may choose contingent work; this is in part substantiated by the literature (See Farber, 1999). A high level of criminality among workers makes it more likely that the workers will choose contingent employment. Examples include illegal workers or ex-convicts who are

[17] The survey question is a composite of two separate survey questions about health limitations to working. The questions are: "(Are you/would you be) limited in the KIND of work you (could) do on a job for pay because of your health?" and "(Are you/would you be) limited in the AMOUNT of work you (could) do because of your health?"

[18] Nonlabor income includes business/farm, unemployment benefits, alimony, child support, AFDC, food stamps, SSI/Public Assistance, VA Benefits/Disability, Inheritance, Gifts, Parent or Relative Support, Other Income (Interest, Dividends, and Rent), other household members' income ,and/or rental subsidy.

more likely to become contingent workers due to the relatively stricter hiring practices. Although I note the potential endogeneity problem, I was not able to control for it by finding valid instrumental variables for *contingent*; I thus retain the ordinary least squares estimates.

In the discussion that follows I first present the ordinary least squares regression results of the effect of work status on individual/family earnings and then draw a comparison of the two outcomes. Lastly, I examine the labor response of the spouse associated with the change in the work status of his partner in the family unit.

Results

The Effect of the Transition into Contingent Work on the Individual and the Family

Tables 2-5 present the distribution of workers among the various work arrangements as of the 1996 and 1998 survey dates by job type held in 1994. They show that most contingent workers make the transition into regular employment within the two and four year periods examined. It is interesting to note that between the two and four year transition periods starting from 1994 and 1996, 17-23% of workers who were contractors in those years remained so two and four years subsequently. Also, approximately a half to two-thirds of workers in contingent work shift into full-time employment within two to four years respectively.[19]

As I suspect that there is unobserved heterogeneity within individuals and families, I test each of the models for the inclusion of a fixed effect.[20] The null hypothesis is that there is no heterogeneity that is fixed over time between persons and households. Across all model specifications shown in table 6 the null hypothesis is rejected at the 1% level of confidence. Therefore, the unobserved factors are not negligible in explaining the differences across individuals/families and thus the fixed-effects approach is the proper model specification.

The fixed-effect ordinary least squares regression coefficient on *contingent* in column 1 of table 6 shows that, on average, the change in total earnings from wages and salary of the respondent associated with a change to contingent work is approximately -0.17 log points; the coefficient is highly statistically significant. I note that in the

[19]Calculations based on the subsamples used in the estimations (table 6 and table 7) show that two-thirds and three-quarters of workers in contingent work shift into full-time employment within 2 to 4 year respectively. See appendix table 5 and appendix table 6.

[20] That is I perform the F test for the null hypothesis that all $v_i = 0$. See model specification.

literature the consensus (using cross-sectional data to examine the effect of contingent work on the individual workers' earnings) is that the effect is negative and significant; regression estimates range from 15-20% lower earnings for those employed on a contingent basis compared to those regularly employed full-time. As shown in column 2, the effect on the family is that a change to contingent is associated with a decrease in total family earnings of 0.03 log points compared to that if the respondent is a regular worker. However, this effect is not significantly different from zero. I document that the contingent employment arrangement has a more profound effect on earnings at the individual respondent level than for the family unit. This result is both unsurprising and intuitive. One explanation for this is that the income effect, discussed previously, outweighs the substitution effect. Thus, the wage change of the one spouse (resulting from a switch to contingent work) on the labor supply of the other spouse is positive. Column 3 shows that the change to contingent work status is associated with the spouse working longer hours. The coefficient on *contingent* is positive but not statistically different from zero at any acceptable level of confidence.

Table 7 presents separate regressions on hours worked for the subsamples of male and female spouses of the respondents. The results show that the average effect on *contingent* is negative/positive for the male and female (spouses of the respondents) respectively. However, neither of the coefficients has any statistically significant effect on the labor response of the spouse, that is the number of weekly hours worked.

As a test of robustness, I use an alternative specification of first differences. [21]

[21] I run a first difference model $\Delta \text{lnfaminc}_t = \alpha + \beta_1 \Delta \text{cont}_t + \beta_2 \Delta \text{reg}_t + \beta_3 \Delta \text{child}_t + \beta_4 \Delta \text{educ}_t + \lambda \Delta \text{region}_{ti} + \Delta \varepsilon_t$ where $\Delta lnfaminc$ is the change in the log of personal earnings/family income between periods. Family income in this model includes nonwage income. $\Delta cont$ is a dummy variable for the change to contingent work status from regular employment; Δreg is a dummy variable denoting the change to regular

In the first difference model I matched the change in the independent variables (over the 1993-1997 periods) with the change in the independent variables (over the 1994-1996 periods). The timing issue then is that the 1994-1996 change in work status takes place after the initial earnings period and before the final earnings period of 1993-1997; in this case, the labor response clearly occurs within the earnings period and the effects plausibly extend to the year after the change has taken place. The results are similar; the coefficient on contingent is negative and significant.

Conclusion

Although these findings may seem unsurprising, care must be taken in the interpretation of these results due to the timing of the data used in the analysis herein. This research finds no evidence that families are unfavorably affected by a change to contingent work. However, it does show that the individual worker is adversely affected; this suggests a policy prescription for individual workers designed to insure them. Some recommendations for mitigating the effect of a change to contingent work for individuals are the provision of health insurance and extended unemployment insurance. Other measures which might fruitfully be the continued focus of policy makers are: programs

---

employment from contingent work status. $\Delta child$ represents the change in the number of children in the household; $\Delta educ$ is the change in the level of education for the respondent; $\Delta region_{ti}$ is a vector of 12 regional dummies each equaling 1 if the respondent lived in a different region[21] from that reported by the respondent in the previous year under examination and zero otherwise. Other controls include race, sex, initial age, and the change in the level of education for the respondent. The time period of change for the dependent variable is 1993-1997 and for the independent variables, 1994-1996. A comparison of the impact of changing to contingent status on family income versus personal earnings shows that the percentage effect of a change to contingent work probably has an equal change, within the confidence interval, as it does on the family versus the individual. For example, for the period 1993-1997, the change in log family income caused by a change to contingent work is approximately, -0.11 log points and the effect on the change in log personal earnings for the respondent is approximately -0.09 log points; the coefficients on the change to contingent work status in the regressions for the change in family income and the change in personal earnings are significant at the 10 percent level and 5 percent level of confidence respectively.

that facilitate the transition into regular employment, job creation, job training, and the promotion of economic stability. To the extent that individuals voluntarily choose contingent employment in response to positive shocks to the spouse's earnings, these policy prescriptions become less relevant. Finally, considering that the periods under this study came at the time of economic expansion[22] the potentially detrimental effect of contingent employment on the family should be examined further.

[22] Per the National Bureau of Economic Research the expansion lasted 120 months; from March 1991 to March 2001. See http://www.nber.org/cycles.html/#announcements.

Table 1: Longitudinal Studies of Contingent Workers by Author and Data Source

Study	Data[a]	Period of Study	Sample Size	Number of Contingent Workers	Wages Examined?	Employment Status?
Farber (1999)	Matched DWS and CWS	1994-1997	102,318 ages 20-66	17,906[b]	no	yes
Ferber and Waldfogel (1998)	NLSY	1979-1993	8,324	6,207[c]	yes	no
Houseman and Polivka (1998)	CWS, CPS	1995-1996	not provided	not provided	no	yes
Rothstein (1996)	NLSY	1979-1994	8,891 ages 29-37	613[d]	yes	yes
Segal and Sullivan (1995)	CPS	1983-1993	390,000 (1983) to 689,000 (1993)	1,122 (1983) to 1,823 (1993)[e]	yes	yes

a. CWS: Current Population Survey: Contingent Work Supplement, February; DWS: Current Population Survey: Displaced Worker Supplement; NLSY: National Longitudinal Survey of Youth 1979-1998; CPS: Current Population Survey, March. b. The author classifies contingent workers in three categories: independent contractors, other self-employed workers and temporary workers. These in turn are classified as follows: independent contractors are independent contractors, consultants, and free-lancers. Other self-employed workers are other than the former classification. And, temporary workers consist of temporary, on-call, and contract workers. c. Nontraditional workers are defined as the self-employed, part-time and temporary workers. d. Defines nonstandard workers as contract workers as well as agency and direct hire temporary workers. See footnote 4.

Table 2: Work Arrangement by Year

Work Arrangement	1994	1996	1998
Regular employee	6770	6968	6913
Temp worker (sent by a temporary agency)	92	122	99
Temp worker (hired directly by the company)	120	128	111
Consultant	22	24	33
Contractor	99	112	120
Employee of a contractor	41	30	48
Other	209	247	189
Total	7353	7631	7514

Note: Survey question asked, "Is R temporary/contractual worker?" Reference numbers from survey instrument are R45881, R52711, and R59384 for the years 1994, 1996, and 1998 respectively. Put in % too or only % and list total sample size at bottom.

Table 3: Two Year Transition, Percentage Distribution of Workers in Work Arrangement in 1996 by Work Arrangement in 1994

	Work Arrangement in 1996						
Work Arrangement in 1994	Regular	Agency Temporary	Direct Hire Temporary	Consultant	Contractor	Employee of Contractor	Other
Regular employee	88.33%	0.95%	0.86%	0.21%	0.86%	0.27%	1.94%
Agency Temporary	63.04	18.48	8.70	0	0	0	1.09
Direct Hire Temporary	62.5	6.67	12.5	0	0.83	0.83	4.17
Consultant	40.91	0	9.09	18.18	9.09	0	13.64
Contractor	56.57	0	0	0	22.22	2.02	9.09
Employee of a contractor	68.29	7.32	0	0	2.44	9.76	0
Other	56.46	0	1.91	0.48	7.18	0	21.53

Source: National Longitudinal Survey of Youth 1979-1998. Percentages across rows sum to 100% when accounting for noninterview and nonresponse categories which this table excludes.

Table 4: Four Year Transition, Percentage Distribution of Workers in Work Arrangement in 1998 by Work Arrangement in 1994

	Work Arrangement in 1998						
Work Arrangement in 1994	Regular	Agency Temporary	Direct Hire Temporary	Consultant	Contractor	Employee of Contractor	Other
Regular employee	84.39%	0.78%	1.02%	0.34%	0.99%	0.43%	1.73%
Agency Temporary	65.22	8.70	1.09	0	2.17	3.26	1.09
Direct Hire Temporary	65.83	5.00	1.67	0.83	0	1.67	1.67
Consultant	59.09	4.55	0	4.55	4.55	0	9.09
Contractor	62.63	1.01	1.01	0	17.17	3.03	5.05
Employee of a contractor	58.54	4.88	0	2.44	4.88	4.88	2.44
Other	61.24	0.48	1.91	0.96	6.70	0.96	11.48

Source: National Longitudinal Survey of Youth 1979-1998. Percentages across rows sum to 100% when accounting for noninterview and nonresponse categories which this table excludes.

Table 5: Two Year Transition, Percentage Distribution of Workers in Work Arrangements in 1998 by Work Arrangement in 1996

	Work Arrangement in 1998						
Work Arrangement in 1996	Regular	Agency Temporary	Direct Hire Temporary	Consultant	Contractor	Employee of Contractor	Other
Regular employee	86.70%	0.89%	1.00%	0.32%	1.08%	0.47%	1.55%
Agency Temporary	60.66	12.30	7.38	0	0	0.82	1.64
Direct Hire Temporary	60.94	4.69	8.59	0.78	0	0.78	2.34
Consultant	54.17	0	4.17	8.33	8.33	0	8.33
Contractor	58.04	0.89	0.89	0.02	22.32	1.79	8.93
Employee of a contractor	56.67	6.67	6.67	0	3.33	16.67	3.33
Other	60.73	0.40	1.62	1.62	4.05	0.40	19.43

Source: National Longitudinal Survey of Youth 1979-1998. Percentages across rows sum to 100% when accounting for noninterview and nonresponse categories which this table excludes

Table 6: OLS w/ Fixed Effect Regression of Work Status on Personal Earnings, Total Family Earnings and Weekly Hours Worked

	(1) Personal Earnings	(2) Total Family Earnings	(3) Weekly Hours Worked by Spouse	Means[+]
Contingent	-0.1650***	-0.0321	0.1280	1.2753
	(0.0318)	(0.0210)	(0.5031)	[1.1342]
Northeast	-0.0275	0.0024	-5.3866**	0.1510
	(0.1423)	(0.0899)	(2.1433)	[0.3581]
North Central	0.0487	0.0443	-5.7626***	.258966
	(0.1201)	(0.0802)	(2.0877)	[0.4381]
South	-0.0440	-0.0331	-5.0922***	.390786
	(0.0979)	(0.0661)	(1.6247)	[0.4880]
Health	-0.0755*	-0.0819***	0.0765	.0493132
	(0.0394)	(0.0271)	(0.6482)	[0.2165]
Education	0.0286	0.0210	-0.8982**	13.52442
	(0.0279)	(0.0192)	(0.4438)	[2.4966]
Kids Ages 0-2	-0.0620***	-0.0228**	-0.9797***	.2552461
	(0.0166)	(0.0112)	(0.2797)	[0.4857]
Kids Ages 3-5	-0.0383***	-0.0219**	-0.6972***	.3202022
	(0.0140)	(0.0094)	(0.2348)	[0.5408]
Nonlabor Income	0.0007	-0.0002	-0.0115	2.291325
	(0.0028)	(0.0019)	(0.0976)	[3.1370]
Constant	8.2722***	9.4383***	57.8746***	
	(0.3833)	(0.2765)	(6.4688)	
Observations	10769	10484	10215	10484
Number of ID# (1-12686) 79	4857	4736	4629	
Adjusted R-squared	0.0350	0.0396	0.0059	

Standard errors in parentheses. + Means calculated from the sample used in column 1. Standard deviations are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Regressions include controls: (1) industry: agriculture; mining; construction; manufacturing; transportation; wholesale and retail trade; financial, insurance and real estate; business and repair services; personal services; entertainment; professional services, public administration (omitted category). (2) Respondent's demographic variables: race, sex and age (3) Respondent's Spouse's demographic variables: age and level of education. (4) Regional dummies: northeast, north central, south, and west (omitted category). The additional regressors included in column 1 are: (1) and (2). Column 2 includes regressors: (2) and (3). Column 3 includes (2) and (3). Note: *contingent* is a dummy variable equaling one if the respondent is a contingent worker and zero otherwise. *health* is a dummy variable that equals one if the respondent's health limits the kind and/or amount of work he/she can perform.

Table 7: OLS w/Fixed Effect Regression of Contingent Status on Weekly Hours Worked by Both Spouses

	(1)	(2)
Dependent Variable: Weekly Hours Worked	Weekly Hours Husband	Weekly Hours Wife
Contingent	-0.0457	0.1519
	(0.6618)	(0.7750)
Kids Ages 0-2	0.2476	-2.2367***
	(0.3969)	(0.3922)
Kids Ages 3-5	0.0111	-1.3518***
	(0.3378)	(0.3240)
Health	-0.3086	1.0620
	(0.8037)	(1.1046)
Northeast	-9.2392***	-2.8138
	(3.3751)	(2.7485)
North Central	-9.9184***	-2.2838
	(3.0081)	(2.9866)
South	-8.2288***	-2.9772
	(2.5349)	(2.1012)
Education	-0.3101	-1.9347***
	(0.5678)	(0.7136)
Nonlabor Income	0.0526	-0.0941
	(0.1341)	(0.1418)
Constant	54.8449***	69.5187***
	(8.3450)	(10.4204)
Observations	5495	4720
Number of ID# (1-12686) 79	2453	2176
Adjusted R-squared	-0.8029	-0.8241

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Columns 1 and 2 include regressors: the age and level of education of the respondent's spouse.

Appendix

Table 1: The NLSY79 has 12,686 observations. For the regressions in tables the sample was restricted as follows:

Sample Selection Criteria (table 6, column 1)
married couples
respondent's personal earnings > 0
hours worked by respondent's spouse > 0

Total # of Observations: 10,769

Sample Selection Criteria (table 6, column 2)
married couples
total family earnings > 0
hours worked by respondent's spouse > 0
hours worked by the respondent > 0

Total # of Observations: 10, 484

Sample Selection Criteria (table 6, columns 3)
married couples
hours worked by respondent's spouse > 0
hours worked by the respondent > 0

Total # of Observations: 10,215

Sample Selection Criteria (table 7, column 1)
married couples
hours worked by respondent's spouse > 0
hours worked by the respondent > 0
respondent's sex is male

Total # of Observations: 5495

Sample Selection Criteria (table 7, column 2)
married couples
hours worked by respondent's spouse > 0
hours worked by the respondent > 0
respondent's sex is female

Total # of Observations: 4720

Appendix

Table 2: Proportion of Families in Poverty by Work Status

	Work Arrangement in 1994	Work Arrangement in 1996	Work Arrangement in 1998
Regular	5.63%	6.99%	6.95%
Contingent	12.29%	16.16%	15.26%
Annual Poverty Rate	13.6%	12.3%	11.6%

Source: National Longitudinal Study of Youth 1979-2004. Poverty status based on total net family income in the years 1993, 1995, and 1997 by work status in 1994, 1996, and 1998 respectively. Other source is the U.S. Bureau of the Census. See footnotes 10 and 11.

Appendix

Table 3: Mean Percentage Distribution of Spousal Earnings to Family Earnings, by Work Arrangement of Respondent in Years 1994, 1996 and 1998

	Work Arrangement		
Year	Regular	Contingent	All Workers
1994	43.46%	50.83%	47.35%
	(30.33) n = 2959	(39.71) n = 228	(36.35) n = 3187
1996	41.84%	47.38%	48.15%
	(34.93) n = 2913	(36.48) n = 226	(197.27) n = 3139
1998	41.21%	82.33%	46.79%
	(30.78) n = 2776	(468.19) n = 199	(121.00) n = 2975

Note: Standard deviation in parentheses. n = number of observations.

Appendix

The Slutsky equation for the effect on leisure of spouse 2 to a change in the wage of spouse 1 is given by the following,

$$L_{2w_1} = \frac{-\lambda[w_1(-w_2U_{ZZ} + pU_{L2Z}) - p(-w_2U_{ZL1} + pU_{L2L1})]}{|M|} + H_1\frac{L_{2V}}{|M|}$$

The Slutsky decomposition is derived by taking the derivative of the first-order conditions with respect to the change in wage 1. I then use Cramer's rule to solve for L_{2w_1} which is the comparative static, the leisure of spouse 2 in response to a change in the wage rate of spouse 1. The signs of each term are discussed in the paper.

$|M|$ is the determinant of the bordered Hessian from the differentiation of the first-order conditions with respect to the change in wage, w_1; by the second-order condition it is positive semi-definite.

$$|M| =$$
$$-p[-w_2(U_{ZL1}U_{L1L2} - U_{L1L1}U_{ZL2}) + w_1(U_{ZL1}U_{L2L2} - U_{L2L1}U_{ZL2}) + p(U_{L1L1}U_{L2L2} - U_{L2L1}U_{L1L2})] -$$
$$w_1[p(U_{L1Z}U_{L2L2} - U_{L2Z}U_{L1L2}) + w_1(U_{ZZ}U_{L2L2} - U_{L2Z}U_{ZL2}) - w_2(U_{ZZ}U_{L1L2} - U_{L1Z}U_{ZL2})] +$$
$$w_2[p(U_{L1Z}U_{L2L1} - U_{L2Z}U_{L1L1}) + w_1(U_{ZZ}U_{L2L1} - U_{L2Z}U_{ZL1}) - w_2(U_{ZZ}U_{L1L1} - U_{L1Z}U_{ZL1})]$$

The numerator for the income effect is:

where

$$L_{2V} = -1[w_2(U_{ZZ}U_{L1L1} - U_{L1Z}U_{ZL1}) - p(U_{L1Z}U_{L2L1} - U_{L2Z}U_{L1L1}) - w_1(U_{ZZ}U_{L2L1} - U_{L2Z}U_{ZL1})]$$

References

Ashenfelter, O. and Heckman. "The Estimation of Income and Substitution Effects in a Model of Family Labor Supply." *Econometrica*. vol. 42, no. 1 (January 1974): 73-85.

Berndt, The Practice of Econometrics. Addison-Wesley Publishing Company. (1991).

Blank, Rebecca M. "Contingent Work in a Changing Labor Market." *Generating Jobs: How to Increase Demand for Less-Skilled Workers*. New York: Russell Sage Foundation (1998): 258-294.

Blank, Rebecca M. "Labor Market Dynamics and Part-Time Work." in John Robst editor, *Research in Labor Economics* volume 17, Stamford, Conn. and London: JAI Press (1998): 57-93.

Davidson, Russell and James G. MacKinnon. *Estimation and Inference in Econometrics*, Oxford University Press (1993).

Diebold, Francis X., David Neumark, and Daniel Polsky. "Job Stability in the United States." Journal of Labor Economics 2 (April 1997): 206-23.

Farber, Henry S. "Alternative and Part-time Employment Arrangements as a Response to Job Loss." *Journal of Labor Economics* 17, no. 4 (Part 2 October 1999): S142-S169.

Farber, Henry S. "Mobility and Stability: The Dynamics of Job Change in Labor Markets." Working Paper #400, Princeton: Industrial Relations Section (June 1998).

Ferber, Marianne and Jane Waldfogel. "Longterm Consequences of Nontraditional Employment." *Monthly Labor Review* 121, no. 5 (May 1998): 3-12.

Houseman, Susan N. and Anne E. Polivka. "The Implications of Flexible Staffing Arrangements for Job Security." *U.S. Department of Labor, Bureau of Labor Statistics*, BLS Working Paper No. 317, June 1998.

Killingsworth, Mark R. *Labor Supply*, Cambridge: Cambridge University Press (1983).

Lyons, Max. "Long-Term Temps: A Rare Breed." Employment Policy Foundation Paper. (1999).Rothstein, Donna. "Contingent Entry into and consequences of nonstandard work arrangements." *Monthly Labor Review*, (October 1996): 75-82.

Schmidt, Stefanie R. and Shirley V. Svorny. "Recent Trends in Job Security and Stability." *Journal of Labor Research* 19, no. 4 (Fall 1998): 647-668.

Segal, Lewis M. and Sullivan, Daniel G. "The Temporary Labor Force." *Economic Perspectives* 19, no. 2 (March/April 1995): 2-19.

Wallace, Leslie. "Survey of the Literature on Temporary Workers." part of *dissertation in progress* University of California, San Diego, Department of Economics (January 2007).

Wallace, "Are_Contingent_Workers_Hours_Constrained." part of *dissertation in progress* University of California, San Diego, Department of Economics (October 2002).