The Dynamics of Dual Job Holding and Job Mobility

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This article concerns dual job holding and its link to job mobility. We present evidence from U.S. data on patterns of dual job holding, hours changes, and job mobility. We find that workers move into and out of second jobs frequently, that these movements are associated with large changes in work hours, and that hours constraints may prompt workers to take second jobs. Second, we review theories of dual job holding and present a stochastic dynamic model of dual job holding and job mobility in which decisions to take second jobs and/or change main jobs are made simultaneously.

I. Introduction

There has been extremely little research done on the economics of dual job holding. This lack of attention is surprising, given the prevalence of dual job holding in the United States. Data drawn from the 1976–89 waves of the Panel Study of Income Dynamics (PSID) indicate that in any one year roughly 20% of working males and 12% of working females hold a second job in addition to their main job or jobs. Furthermore, the same group of people do not hold second jobs year after year. More than 50%

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of continuously working males hold a second job some time during their working lives, and there is a great deal of movement into and out of second jobs.

This article is concerned with the characteristics and dynamics of dual job holding. There are two main goals. The first is to characterize dual jobs and dual job holders, with a focus on dynamics. For example, we examine patterns of mobility into and out of second jobs for individual workers over time and the hours changes that accompany movements into and out of second jobs. Our objective is to understand why and when workers move into and out of second jobs. We use for our analysis the 1976–89 waves of the PSID, where individuals are observed over time and asked each year a series of questions about the different jobs they held in the previous year. Whenever possible, we present parallel evidence from the May 1991 Current Population Survey (CPS), where individuals were asked about jobs they held in the week prior to the survey. Although the CPS has no panel element, it can be used to cross-check results from the PSID.

The second aim of the article is to examine models of dual job holding, in light of the evidence presented in Section II. The existing literature suggests several different motivations for dual job holding. Workers may face hours constraints on their main jobs. They may seek to assemble a "portfolio" of jobs that provide desirable bundles of job characteristics. They may use dual job holding to learn about new occupations or to gain training. Although some of our findings are consistent with several different reasons for dual job holding, none of these theories deals with our principal findings, namely, that dual job holding is a prevalent and dynamic process, that workers move in and out of dual job holding along their working careers, that both dual job holding and job change are used to adjust hours of work, and that a discrepancy between working hours and desired hours of work is a common phenomenon.

We present a stochastic dynamic model that seeks to explain why and when workers move into and out of second jobs, focusing on the link between dual job holding and job mobility. The model is one in which dual job holding is driven by hours constraints on jobs.[1] The hours desired by workers vary over time because of expected and unexpected changes in factors that determine the value of consumption relative to leisure. Hours required by employers may vary as well. If a worker wants to work more

[1] There are a variety of reasons why hours constraints might exist. Firms that must coordinate the schedules of many workers may impose hours constraints (see Siow 1990). Other reasons are discussed in Kahn and Lang (1987). Furthermore, the marginal productivity of a worker *within a job* may decrease with the number of hours worked, making dual job holding attractive even if hours constraints are not employer-imposed.

on his main job (but cannot), he or she must choose between moving to a new main job with higher hours and incurring a mobility cost or taking a second job at a lower wage. This decision is made in a dynamic context: the worker knows that desired hours will continue to evolve in the future, and decisions about dual job holding and job mobility are made accordingly. To our knowledge, this is the first article that analyzes joint decisions of job mobility and dual job holding in a dynamic framework.[2]

The article proceeds as follows. In Section II we describe the data and present descriptive evidence on characteristics of dual job holding for males and females. In Section III we discuss the different theories of dual job holding suggested in the literature and evaluate them in light of our findings. In Section IV we present our dynamic model of dual job holding and job mobility. Section V summarizes the article.

II. Empirical Analysis and Characteristics of Dual Job Holding

A. Data

The evidence in this section is based on data drawn from the 1976–89 waves of the PSID (Morgan, Duncan, Hill, and Lepkowski 1992). For information on an individual to be used in a specific year, the individual had to be a head of household or that person's spouse. The poverty subsample was excluded. We supplement the PSID with data from the May 1991 Current Population Survey. With the exception of table 1, we limit the CPS sample to heads of households ("reference person") and their husbands or wives so that it matches the PSID sample.

The accuracy of our results depends critically on whether "dual job holding" is measured correctly. We wish to define individuals as dual job holders if they held two or more jobs simultaneously. However, the PSID does not explicitly ask respondents about whether "extra" jobs are held simultaneously with main jobs. Specifically, the PSID asks the following question: "Did you (head) [your wife/"wife"][3] have an extra job or other way of making money in addition to your main job in [the year before the survey]?" This wording makes it possible that some of these "extra jobs" were actually main jobs. For example, a worker who had quit job A and moved to job B during the year before the survey might have reported job A as an "extra job."

We do not believe this to be a serious problem, for several reasons. First, the question on extra jobs is asked after a series of questions on "job

[2] The few papers that have been written on dual job holding and hours constraints have been conducted in a static framework (see, e.g., Shishko and Rostker 1976). We discuss these models in Section III below.

[3] The PSID uses the term "wife" (in quotes) in referring to these long-term female cohabitors.

Table 1
Rates of Dual Job Holding over Time, PSID and CPS

	PSID		CPS	
Year	Males	Females	Males	Females
1976	.229	.110	5.8	2.6
1977	.208	.141	6.2	3.4
1978	.214	.149	5.8	3.3
1979	.223	.098	5.9	3.5
1980	.210	.098	5.8	3.8
1981	.229	.116	...	...
1982	.230	.114	...	...
1983	.230	.114	...	...
1984	.202	.131	...	...
1985	.205	.148	5.9	4.7
1986	.203	.137	...	...
1987	.204	.134	...	...
1988	.181	.110	...	...
1989	.197	.130	6.4	5.9
1991	...	...	6.4	5.9
1976–91	.211	.122	...	...

NOTE.—The PSID sample includes heads of household and spouses, and reports the rate of dual job holding in the prior calendar year. The poverty subsample is excluded. The CPS sample include all employed individuals, and reports rates over the week prior to the survey. For details, see the U.S. Bureau of Labor Statistics (1991).

history," and in the context of the survey it seems clear that the question is meant to measure second jobs. Starting in 1981, the preceding employment history questions became more detailed, making it even more clear that the question was about a second job; table 1 indicates that there was no dramatic decrease, but rather an increase, in the rate of dual job holding after 1980. Our definition of dual job holders includes those whose second job is in the armed forces (i.e., the army reserves). When army reservists are not treated as dual job holders, rates of dual job holding over the 1976–91 period fall slightly, from .211 to .197 for males and from .122 to .115 for females, but there are no large changes in the time-series pattern of rates of dual job holding.

Second, the CPS and PSID data on dual job holding appear to be roughly comparable. Since the CPS asks about dual job holding in the week before the survey, answers are much less likely to reflect sequential jobs. However, it is not straightforward to compare the CPS and PSID numbers because they are based on different reference periods. We converted the "annual" rates of dual job holding from the PSID to "weekly" values by dividing the weeks of work on the second job by weeks employed in the previous year.[4] The mean "weekly" rates of dual job holding in the PSID, reported

[4] Weeks of employment is measured as 52 minus weeks of unemployment minus weeks out of the labor force. See the notes to table 2 for more details.

in table 2, were 9.5% for men and 6.2% for women, fairly close to the 7% and 6% reported in the CPS. The PSID and CPS also show similar rates of dual job holding within main job occupation groups.

Third, 70% of dual job holders from the PSID report more than 52 weeks worked on all jobs, an indication that they held the two (or more) jobs simultaneously at least part of the year. Twenty-one percent report total weeks between 96 and 104, indicating that they held more than one job for most of the year.

B. Rates of Dual Job Holding

Table 3 presents information on (1) the rate of dual job holding for males and females by occupation; (2) the percentage of cases in which the second job is in the same occupation as the main job; and (3) other occupations in which workers most frequently moonlight. Table 4 reports the same information for the CPS sample. Both samples show considerable variation in dual job holding across occupations, although with no clear relation to skill level. Not surprisingly, male teachers have the highest rates of dual job holding. This is *not* merely due to summer jobs held by teachers. Teachers had the highest rate of dual job holding in the May 1991 CPS, conducted when most schools would have been in session. In the PSID, no occupation has a rate of dual job holding less than 15.2% for males (and 5.6% for women). Rates are somewhat lower in the CPS, due to the weekly rather than annual reference period.

Table 3 indicates that nearly 78% of male and 72% of female dual job holders have second job occupations that differ from those on the main job (at a 2-digit level). In the CPS sample the rates are 83% and 77%, respectively. Medical professionals, accountants, lawyers, and craftsmen are most likely to take second jobs in their main occupation. However, even among these groups, a large fraction (around 40% for male accountants) take second jobs in different occupations.

The fact that people often go outside of the occupation of their main job when selecting second jobs is perhaps surprising. However, it is consistent with several models of dual job holding. First, it could easily be explained by a "portfolio" model, in which workers choose packages of jobs so as to optimize over the mean and variance of income. In this case, jobs in different occupations offer some insurance, insofar as the correlation between returns in different occupations is relatively low. Second, it is also consistent with models in which second jobs provide workers with training, professional contacts, or other desirable characteristics that cannot be obtained in the main job occupation. Finally, workers with hours constraints on their main jobs may seek second jobs in other occupations, simply because evening and weekend hours are not available in their main job occupations. The high fraction of female dual job holders who work (in

Table 2
"Weekly" Rates of Dual Job Holding by Main Job Occupation, PSID, Heads of Households and Spouses, 1984–89 (Excluding the Poverty Subsample)

	Males		Females	
Occupational Category	Frequency	Rate	Frequency	Rate
1. Physicians, dentists	112	.144	23	.258
2. Other medical and paramedical	103	.199	538	.080
3. Accountants and auditors	217	.104	138	.058
4. Teachers, primary and secondary school	278	.223	875	.103
5. Teachers (college), social scientists, librarians	191	.160	172	.129
6. Architects, engineers, scientists	692	.062	69	.064
7. Technicians	693	.110	468	.065
8. Public advisors	261	.095	251	.045
9. Judges, lawyers	175	.121	38	.056
10. Professional, technical and kindred workers, not above	152	.173	205	.157
11. Managers, nonfarm, not self-employed	1,967	.084	1,090	.052
12. Managers, nonfarm, self-employed	908	.085	231	.047
13. Secretaries, stenographers, typists	9	.256	1,093	.047
14. Other clerical workers	568	.107	2,430	.053
15. Sales workers	268	.075	243	.053
16. Foremen	323	.073	25	.072
17. Other craftsmen and kindred workers	2,583	.082	169	.054
18. Government protective service workers	247	.172	40	.053
19. Members of armed forces	296	.073	43	.021
20. Transport equipment operatives	799	.071	93	.067
21. Operatives, except transport	1,179	.078	963	.045
22. Unskilled laborers (nonfarm)	607	.079	90	.059
23. Farm laborers and foremen	160	.107	22	.139
24. Private household workers	1	.000	197	.057
25. Other service workers	545	.088	1,966	.057
26. Farmers (owner and tenant) and farm managers	375	.184	24	.063
Total	13,709	.095	11,496	.062

NOTES.—The "weekly" rate of dual job holding is defined as weeks of work last year in second (and third, when available) jobs divided by weeks employed last year. There is no direct measure of "total weeks employed" in the PSID, and so we measured it as 52 minus weeks unemployed minus weeks out of the labor force. This seemed preferable to using the variable "weeks worked on the main job" as the denominator since this does not include things like weeks of vacation and weeks of illness, during which the worker may have been employed at a main job and may actually have performed work on a second job. The variable "weeks out of the labor force" is not available prior to 1984, and so the numbers in this table are from 1984–89 only.

second jobs) in "other clerical," sales, and "other service" suggests that this may be the case.

C. Wages on Main and Second Jobs

Different theories of dual job holding have different implications for the relationship between the wage on the main and second jobs. For example, the textbook model of dual job holding in the presence of hours constraints

assumes that the second job wage is lower than the wage on the main job. This produces a "kink" in the worker's budget constraint, given an hours ceiling on the main job. The standard result of this model is that not all workers who are bound by hours constraints on their main jobs will take second jobs.

The evidence on the relationship between main and second job wages is sketchy because questions about second job wages and earnings often yield missing data. For example, in the PSID, second job wages cannot be computed for 27% of the male dual job holders and 42% of the female dual job holders in table 3. The CPS fares even worse, with only about 15% of dual job holders having nonmissing wage data. It may be that the likelihood of having missing data is correlated with the true second job wage, and so the numbers presented below must be treated with caution.

Table 5 reports the means and medians, for each occupational group, of the ratio of the second to main job wage rate, and table 6 reports the same information using the CPS sample. This ratio may overstate the true ratio of wages on second and main jobs since fringe benefits are not included in either measure of wages.[5] The median wage ratio is positively correlated with skill level: for example, doctors, judges, lawyers, accountants, and self-employed managers have high wage ratios. Workers who are neither professionals nor managers tend to have lower wage ratios, although there are some exceptions to this rule. One interesting comparison is between college and university teachers (median ratio of 1.29 for males) and primary and secondary school teachers (median ratio of .75 for males). The variation in the wage ratios across occupations suggests that different groups of workers may be motivated to hold second jobs for very different reasons. Hours constraints models of dual job holding may be relevant to the group with a ratio less than one, whereas other models of dual job holding may be more appropriate for other groups. Our results in Subsection IIF below support this idea.

D. Prevalence of Dual Job Holding over Time and Job Mobility

The dramatically higher rates of dual job holding reported (on an annual basis) in the PSID relative to those reported in the CPS (on a weekly basis) indicate that many workers move into and out of second jobs over time. Table 7 extends this analysis over a longer period of time. For a sample of men from the PSID who had positive work hours in all years between 1976 and 1989 (and women between 1979 and 1989), 64.4% of the men and 42.7% of the women held a second job in at least one year. Presumably, the fraction of workers who hold a second job at some time during their

[5] If fringe benefits do not vary with hours, then this ratio is an accurate measure of the ratio of the marginal wages on the second and first job.

Table 3
Rate of Dual Job Holding and Second Job Occupations by Main Job Occupation, PSID, Heads of Households and Spouses, 1976–89

Occupational Category	OBS	%DJH	Same Occupation	Other Occupations			
				Code	%	Code	%
Males:							
1. Physicians, dentists	238	.246	.842	11	.070	10	.053
2. Other medical and paramedical	206	.332	.403	8	.224	26	.119
3. Accountants and auditors	491	.230	.559	11	.135	19	.090
4. Teachers, primary and secondary school	603	.517	.235	17	.156	10	.113
5. Teachers (college), social scientists, librarians	405	.457	.293	10	.232	6	.111
6. Architects, engineers, scientists	1,474	.152	.225	17	.165	12	.101
7. Technicians	1,368	.202	.279	26	.103	11	.077
8. Public advisors	542	.235	.129	10	.202	5	.137
9. Judges, lawyers	351	.237	.378	15	.232	10	.159
10. Professional, technical and kindred workers, not above	354	.371	.279	4	.109	5	.101
11. Managers, nonfarm, not self-employed	4,355	.176	.128	15	.119	17	.106
12. Managers, nonfarm, self-employed	1,620	.186	.122	26	.190	11	.160
13. Secretaries, stenographers, typists	28	.179	.200	10	.400	3	.200
14. Other clerical workers	1,383	.206	.075	25	.175	10	.118
15. Sales workers	1,044	.177	.193	11	.122	10	.111
16. Foremen	828	.166	.000	17	.256	26	.222
17. Other craftsmen and kindred workers	5,914	.210	.410	26	.106	25	.057
18. Government protective service workers	515	.326	.074	25	.228	19	.142
19. Members of armed forces	611	.176	.066	17	.160	25	.141
20. Transport equipment operatives	1,750	.165	.168	17	.186	22	.118
21. Operatives, except transport	3,059	.184	.077	17	.183	25	.115
22. Unskilled laborers (nonfarm)	1,291	.203	.227	25	.141	17	.129
23. Farm laborers and foremen	375	.243	.189	17	.211	26	.200
24. Private household workers	3	.333	.000	12	1.00	...	...
25. Other service workers	1,121	.213	.203	17	.198	22	.129
26. Farmers (owner and tenant) and farm managers	901	.325	.096	17	.186	15	.139
Total	30,830	.211	.223				

Table 3 (*Continued*)

Occupational Category	OBS	%DJH	Same Occupation	Other Occupations			
				Code	%	Code	%
Females:							
1. Physicians, dentists	26	.308	1.00	...	...	...	...
2. Other medical and paramedical	1,030	.142	.466	25	.115	19	.107
3. Accountants and auditors	240	.125	.393	14	.286	25	.107
4. Teachers, primary and secondary school	1,832	.202	.315	10	.110	14	.098
5. Teachers (college), social scientists, librarians	368	.275	.258	10	.138	4	.112
6. Architects, engineers, scientists	94	.143	.083	10	.250	2	.167
7. Technicians	759	.132	.322	25	.144	15	.122
8. Public advisors	485	.143	.125	4	.156	10	.156
9. Judges, lawyers	60	.123	1.00	...	...	...	...
10. Professional, technical and kindred workers, not above	344	.299	.255	4	.160	15	.128
11. Managers, nonfarm, not self-employed	1,918	.099	.059	14	.196	15	.149
12. Managers, nonfarm, self-employed	417	.132	.102	15	.184	25	.102
13. Secretaries, stenographers, typists	2,550	.106	.221	14	.186	25	.160
14. Other clerical workers	5,182	.098	.259	25	.227	15	.155
15. Sales workers	827	.132	.238	14	.190	25	.191
16. Foremen	52	.146	.000	14	.286	15	.286
17. Other craftsmen and kindred workers	296	.124	.118	14	.265	21	.177
18. Government protective service workers	68	.185	.182	25	.455	17	.182
19. Members of armed forces	75	.056	.000	10	.333	20	.333
20. Transport equipment operatives	197	.174	.069	21	.276	25	.207
21. Operatives, except transport	2,331	.062	.149	25	.422	14	.116
22. Unskilled laborers (nonfarm)	186	.086	.000	25	.357	4	.143
23. Farm laborers and foremen	64	.167	.250	21	.375	4	.125
24. Private household workers	358	.120	.256	25	.256	15	.103
25. Other service workers	4,292	.124	.462	15	.115	21	.090
26. Farmers (owner and tenant) and farm managers	46	.171	.000	15	.333	7	.167
Total	24,098	.122	.284				

NOTE.—The sample includes heads of households and spouses. The poverty subsample is excluded. Results where the poverty subsample is included are available on request. OBS = number of person*years; %DJH = % of observations in which individuals reported holding a second job in the year before the survey; Same Occupation = % of dual job holders with the same 2-digit second and main job occupation codes; Other occupation = Occupational code and % of dual job holders in the most frequent occupation of second job (beside same job).

Table 4
Rates of Dual Job Holding (over Last Week) and Other Occupations Held by Main Job Occupation, May 1991 CPS, Heads of Household and Spouses (Using Supplement Weights)*

Occupational Category	OBS	Rate	Same Occupation	Other Occupations			
				Code	%	Code	%
Males:							
1. Administrators and officials, public administrators	191	.112	.000	34	.230	2	.199
2. Other excecutives, administrators, and managers	3,768	.066	.121	12	.172	43	.118
3. Management related occupations	1,051	.068	.182	2	.141	19	.078
4. Engineers	934	.053	.144	33	.148	2	.140
5. Mathematical and computer scientists	309	.088	.311	15	.168	9	.145
6. Natural scientists	174	.044	.501	10	.239	43	.130
7. Health diagnosing occupations	386	.093	.492	43	.148	19	.118
8. Health assessment and treating occupations	146	.121	.264	12	.181	43	.121
9. Teachers, college and university	251	.197	.080	12	.310	3	.140
10. Teachers, except college and university	606	.193	.199	12	.164	2	.078
11. Lawyers and judges	363	.054	.263	9	.184	12	.139
12. Other professional specialty occupations	1,057	.101	.407	9	.095	2	.077
13. Health technicians	98	.144	.252	15	.143	2	.138
14. Engineering and science technicians	468	.086	.150	33	.127	12	.114
15. Technicians not health, engineering and science	338	.088	.169	12	.189	19	.105
16. Supervisors and proprietors, sales occupations	1,352	.049	.126	2	.118	43	.115
17. Sales representatives, finance and business service	721	.048	.219	12	.327	2	.167
18. Sales representatives, commodities, not retail	671	.059	.171	12	.135	19	.133
19. Sales, retail and personal services	729	.057	.138	26	.128	18	.104
20. Sales related occupations	18	.038	.000	29	.556	17	.444
21. Supervisors, administrative support	160	.074	.000	16	.214	5	.177
22. Computer equipment operators	125	.096	.000	19	.297	43	.183
23. Secretaries, stenographers and typists	28	.171	.000	44	.340	9	.292
24. Financial records, processing occupations	107	.099	.000	26	.187	12	.186
25. Mail and message distributing	278	.085	.000	19	.144	33	.133
26. Other administrative support and clerical	904	.082	.106	12	.151	19	.124
27. Private household service	12	.000	...	...	...	...	...
28. Protective service occupations	876	.144	.323	2	.095	34	.075
29. Food service occupations	523	.060	.350	19	.197	33	.071

Table 4 (*Continued*)

Occupational Category	OBS	Rate	Same Occupation	Other Occupations			
				Code	%	Code	%
30. Health service occupations	99	.169	.122	44	.212	38	.136
31. Cleaning and building service occupations	819	.065	.300	28	.097	43	.079
32. Personal service occupations	216	.080	.114	19	.282	10	.144
33. Mechanics and repairers	2,180	.053	.181	43	.197	31	.081
34. Construction trades	2,530	.054	.248	43	.158	2	.100
35. Other precision production occupations	1,612	.055	.067	43	.115	2	.110
36. Machine operators and tenders, not precision	1,364	.058	.036	43	.138	33	.110
37. Fabricators, assemblers, inspectors, and samplers	793	.041	.044	43	.244	42	.131
38. Motor vehicle operators	1,673	.060	.144	34	.111	19	.103
39. Other transportation and material moving	646	.052	.068	43	.297	33	.157
40. Construction laborers	331	.044	.090	44	.279	43	.243
41. Freight, stock and material handlers	415	.106	.084	43	.136	12	.110
42. Other handler equipment cleaners and laborers	643	.053	.055	10	.099	17	.098
43. Farm operators and managers	752	.061	.043	38	.280	44	.100
44. Farm workers and related occupations	681	.061	.069	43	.402	34	.139
45. Forestry and fishing occupations	107	.061	.000	44	.493	1	.194
46. Armed forces, currently civilian	9	...	...	...	...	...	...
47. Total	31,514	.070	.1720				
Females:							
1. Administrators and officials, public administrators	158	.081	.000	12	.333	10	.175
2. Other excecutives, administrators, and managers	2,147	.059	.079	19	.146	24	.108
3. Management related occupations	1,069	.057	.223	19	.185	17	.062
4. Engineers	67	.068	.000	12	.856	19	.146
5. Mathematical and computer scientists	180	.037	.000	9	.306	19	.283
6. Natural scientists	64	.063	.224	19	.560	9	.216
7. Health diagnosing occupations	79	.090	.809	9	.191	...	...
8. Health assessment and treating occupations	1,162	.089	.636	30	.077	10	.071
9. Teachers, college and university	157	.131	.265	12	.223	3	.142
10. Teachers, except college and university	1,788	.069	.279	12	.201	19	.093
11. Lawyers and judges	96	.000	...	...	...	...	...
12. Other professional specialty occupations	1,152	.096	.377	9	.098	19	.067
13. Health technicians	640	.093	.528	19	.133	30	.066
14. Engineering and science technicians	155	.042	.000	38	.361	44	.247
15. Technicians not health, engineering, and science	232	.021	.000	3	.363	19	.236

Table 4 (*Continued*)

Occupational Category	OBS	Rate	Same Occupation	Other Occupations			
				Code	%	Code	%
16. Supervisors and proprietors, sales occupations	705	.039	.000	19	.342	29	.124
17. Sales representatives, finance and business service	512	.043	.098	12	.207	19	.190
18. Sales representatives, commodities, not retail	179	.045	.000	8	.391	32	.236
19. Sales, retail and personal services	1,798	.066	.209	2	.096	12	.080
20. Sales related occupations	31	.042	.000	19	.775	36	.225
21. Supervisors, administrative support	248	.056	.000	19	.518	23	.234
22. Computer equipment operators	224	.073	.094	19	.370	31	.128
23. Secretaries, stenographers and typists	2,427	.055	.138	19	.252	26	.110
24. Financial records, processing occupations	1,247	.062	.298	19	.290	29	.068
25. Mail and message distributing	179	.085	.085	19	.225	24	.177
26. Other administrative support and clerical	3,487	.062	.206	19	.180	29	.112
27. Private household service	298	.068	.057	19	.299	31	.216
28. Protective service occupations	127	.075	.000	31	.307	19	.279
29. Food service occupations	1,467	.053	.210	19	.244	43	.082
30. Health service occupations	988	.066	.398	31	.126	27	.104
31. Cleaning and building service occupations	729	.047	.369	19	.144	32	.105
32. Personal service occupations	1,099	.060	.168	19	.196	29	.132
33. Mechanics and repairers	75	.007	.000	2	1.000	...	...
34. Construction trades	56	.003	.000	19	1.000	...	...
35. Other precision production occupations	483	.046	.108	19	.241	16	.201
36. Machine operators and tenders, not precision	1,125	.039	.028	19	.212	29	.168
37. Fabricators, assemblers, inspectors and samplers	599	.037	.000	19	.288	43	.171
38. Motor vehicle operators	230	.062	.000	19	.410	43	.155
39. Other transportation and material moving	33	.000	...	...	...	...	...
40. Construction laborers	9	.000	...	...	...	...	...
41. Freight, stock and material handlers	142	.030	.000	37	.538	26	.342
42. Other handler equipment cleaners and laborers	277	.054	.000	29	.235	19	.230
43. Farm operators and managers	145	.078	.000	26	.275	23	.199
44. Farm workers and related occupations	222	.071	.179	43	.349	26	.122
45. Forestry and fishing occupations	5	.000	...	...	...	...	...
46. Armed forces, currently civilian	4	...	...	...	...	...	...
47. Total	28,296	.061	.233				

* See notes to tables 1 and 3.

Table 5
Wages on Second Job, Relative to Wages on Main Job by 2-Digit Occupational Classification, PSID 1976–89, Heads of Households and Spouses (Excluding the Poverty Subsample)

	Males			Females		
Occupational Category	Observations	Mean	Median	Observations	Mean	Median
1. Physicians, dentists	42	2.495	1.781	7	2.579	2.310
2. Other medical and paramedical	52	1.153	.996	91	1.491	1.115
3. Accountants and auditors	84	2.010	1.381	17	1.770	1.178
4. Teachers, primary and secondary school	246	.922	.751	210	1.068	.876
5. Teachers (college), social scientists, librarians	140	1.683	1.293	55	1.183	1.051
6. Architects, engineers, scientists	153	1.618	1.127	6	.846	.607
7. Technicians	206	1.626	1.072	67	1.464	1.132
8. Public advisors	88	2.072	1.233	40	1.859	1.027
9. Judges, lawyers	56	2.726	1.648	6	4.801	4.728
10. Professional, technical and kindred workers, not above	106	1.569	1.203	53	3.348	1.280
11. Managers, nonfarm, not self-employed	474	1.510	.992	112	1.463	.928
12. Managers, nonfarm, self-employed	189	3.615	1.807	16	4.198	1.593
13. Secretaries, stenographers, typists	5	1.078	.897	153	1.571	.956
14. Other clerical workers	207	1.475	.802	289	1.334	.995
15. Sales workers	108	2.196	1.167	36	1.799	.973
16. Foremen	86	1.395	1.012	5	.742	.704
17. Other craftsmen and kindred workers	856	1.527	1.071	22	1.321	.847
18. Government protective service workers	143	.982	.905	6	2.199	1.094
19. Members of armed forces	85	1.373	.886	3	3.457	1.365
20. Transport equipment operatives	208	1.445	.991	18	1.065	.910
21. Operatives, except transport	396	1.281	.863	86	1.432	.825
22. Unskilled laborers (nonfarm)	200	1.772	1.115	10	1.988	1.200
23. Farm laborers and foremen	52	1.779	1.212	5	1.953	1.814
24. Private household workers	1	1.799	1.799	31	2.230	1.204
25. Other service workers	177	1.561	1.091	269	1.460	1.074
26. Farmers (owner and tenant) and farm managers	200	6.517	2.350	4	3.636	1.361
27. All	4,724	1.839	1.050	1,716	1.715	1.005

NOTE.—"All" includes 164 cases for men and 99 cases for women in which the main job occupation code is missing. Wage on second job is the pay per hour, on average, on the first extra job, in the previous calendar year. Wage on the main job is the labor income in the previous calendar year, divided by total hours of work. Labor income includes income from (1) labor part of farm income, (2) labor part of business income, (3) wages income, (4) bonuses, overtime, commissions, (5) income from professional practice or trade, (6) labor part of market gardening income, and (7) labor part of roomers and boarders income. This variable is constructed by the PSID. For more detail, see the PSID Code books. We also calculated this table using the hourly wage reported at the time of the previous survey. The estimates are lower, with total means and medians of 1.528 and .972 for men, and 1.403 and .947 for women.

Table 6
Wage on Second Job Relative to Wage on Main Job, May 1991 CPS, Heads of Household and Spouses (Using Supplement Weights)

	Men			Women		
Occupational Category	Observations	Mean	Median	Observations	Mean	Median
1. Administrators and officials, public administrators	1	2.500	2.500	1	.400	.400
2. Other excecutives, administrators, and managers	26	1.181	.805	13	1.520	1.067
3. Management related occupations	11	.994	.893	8	1.755	1.315
4. Engineers	10	1.196	.953	0	...	...
5. Mathematical and computer scientists	5	2.149	2.500	3	1.303	.840
6. Natural scientists	2	1.969	1.372	2	.463	.761
7. Health diagnosing occupations	1	.780	.780	0	...	...
8. Health assessment and treating occupations	3	.581	.952	21	.973	.906
9. Teachers, college and university	5	2.271	1.584	4	1.813	1.478
10. Teachers, except college and university	20	.854	.739	17	1.117	1.067
11. Lawyers and judges	2	.448	.368	0	...	...
12. Other professional specialty occupations	18	2.410	1.143	11	1.193	.833
13. Health technicians	1	1.185	1.185	10	1.036	.978
14. Engineering and science technicians	5	.890	.829	0	...	...
15. Technicians not health, engineering and science	2	.329	.545	3	.549	.314
16. Supervisors and proprietors, sales occupations	7	2.893	.887	2	.500	.536
17. Sales representatives, finance and business service	4	.948	.950	0	...	...
18. Sales representatives, commodities, not retail	5	.871	.867	1	1.667	1.667
19. Sales, retail and personal services	11	1.927	2.174	15	1.358	1.083
20. Sales related occupations	0	...	...	0	...	...
21. Supervisors, administrative support	1	.755	.755	1	.600	.600
22. Computer equipment operators	2	2.019	2.222	6	.836	.884
23. Secretaries, stenographers, and typists	1	.215	.215	22	1.293	.932
24. Financial records, processing occupations	1	.516	.516	12	.982	.811
25. Mail and message distributing	2	1.020	.999	2	1.257	1.347
26. Other administrative support and clerical	11	.670	.694	36	.898	.722
27. Private household service	21	1.048	1.000	2	.438	.720

Table 6 (*Continued*)

Occupational Category	Men			Women		
	Observations	Mean	Median	Observations	Mean	Median
28. Protective service occupations	11	1.771	1.000	1	.778	.778
29. Food service occupations	5	1.098	.750	9	1.437	1.350
30. Health service occupations	7	.799	.775	6	.677	.695
31. Cleaning and building service occupations	0	...	...	7	1.117	.933
32. Personal service occupations	12	1.130	1.159	10	1.167	.960
33. Mechanics and repairers	19	1.000	.909	0	...	...
34. Construction trades	11	.642	.522	0	...	...
35. Other precision production occupations	13	.801	.694	5	.702	.491
36. Machine operators and tenders, not precision	5	.737	.609	8	1.658	1.213
37. Fabricators, assemblers, inspectors, and samplers	14	.874	.667	2	.936	.854
38. Motor vehicle operators	3	.733	.875	1	.909	.909
39. Other transportation and material moving	2	.570	.525	0	...	...
40. Construction laborers	9	.888	.594	0	...	...
41. Freight, stock and material handlers	1	1.000	1.000	1	.521	.521
42. Other handler equipment cleaners and laborers	0	...	...	2	.865	1.026
43. Farm operators and managers	8	2.021	1.953	0	...	...
44. Farm workers and related occupations	0	...	...	0	...	...
45. Forestry and fishing occupations	0	...	...	0	...	...
46. Armed forces, currently civilian	0	...	...	0	...	...
47. Total	298	1.205	.871	244	1.135	.959

NOTE.—Wages are calculated as weekly earning divided by weekly hours of work. Out of 1,949 males who had a second job and were either heads or spouses of household, only 298 had all information required to be included in the table. For women, the numbers are 1,553 and 244, respectively.

lives is higher. There is also evidence of substantial movements into and out of second jobs. For example, of men who held second jobs in 6 out of the 14 years sampled, only 14.3% held a second job in 6 consecutive years. The data suggest a nonlinear relationship between dual job holding and mobility on the main job. Workers who either never or almost always hold second jobs have low separation rates from their main jobs. Those who move into and out of second jobs often also change their main jobs more often. Although this fact does not provide direct evidence on an hours constraints model (and could simply indicate that some workers are

Table 7
Dual Job Holding over Time and Job Mobility, for Individuals Who Worked in All Years from 1976 to 1989

Number of Years in a Second Job	Observations (1)	% of Sample (2)	Annual Hours		Sepn Rate (5)	No. of Spells of Second Jobs (% of Row)		
			Mean (3)	CV (4)		1 (6)	2 (7)	3+ (8)
Males (sample: 1,017 people):								
0	362	35.6	2,214.6	13.7	.064	...	...	...
1	149	14.7	2,233.6	17.0	.108	100.0	...	...
2	99	9.7	2,367.3	17.7	.118	44.4	55.6	...
3	61	6.0	2,406.1	18.9	.146	29.5	57.4	13.1
4	58	5.7	2,424.7	18.6	.115	32.8	36.2	31.0
5	48	4.7	2,356.2	20.2	.138	16.7	43.8	39.5
6	35	3.4	2,308.4	19.8	.159	14.3	28.6	57.1
7	35	3.4	2,446.3	23.2	.139	8.6	42.9	48.5
8	43	4.2	2,389.1	21.6	.123	23.3	30.2	46.5
9	22	2.2	2,357.3	18.7	.152	45.5	27.3	27.2
10	26	2.6	2,478.4	17.2	.047	30.8	42.3	26.9
11	22	2.2	2,491.5	17.3	.062	27.3	50.0	22.7
12	23	2.3	2,591.5	17.6	.071	43.5	39.1	17.4
13	14	1.4	2,422.1	22.9	.071	42.9	57.1	...
14	20	2.0	2,786.6	16.3	.050	100.0	...	...
Females (sample: 627 people):								
0	359	57.3	1,753.4	16.9	.074	...	...	...
1	98	15.6	1,780.4	21.8	.120	100.0	...	...
2	45	7.2	1,780.5	26.7	.194	62.2	37.8	...
3	32	5.1	1,868.8	19.6	.148	43.8	46.9	9.4
4	26	4.2	1,881.8	25.0	.164	7.7	50.0	42.3
5	11	1.8	1,917.2	23.0	.116	27.3	54.6	18.2
6+	56	8.9	1,891.6	25.8	.162	37.5	33.9	28.6

NOTE.—The samples consists of individuals who worked positive hours in each year between 1976 and 1989 (males) and 1979 to 1989 (females). Individuals could have experienced spells of unemployment or spells out of the labor force. The number of years in a second job is the number of years from 1976 to 1989 that the person reported at least one job in addition to his or her main job or jobs. The number of spells of second jobs is the number of groups of contiguous years in which the individual was a dual job holder. The data do not indicate whether individuals changed their second jobs, so a single spell of dual job holding could consist of several dual jobs held contiguously. The mean and coefficient of variation (CV) of hours is the average, over all individuals, of each person's mean and coefficient of variation of total annual hours over the sample period. Sepn Rate is the mean, over all individuals, of each person's separation rate from his or her *main* job. Information on tenure and separation in the PSID is problematic (see Brown and Light 1992). Details of how we constructed these variables to ensure reliability and consistency of the data are available on request.

more stable than others), it does indicate that a joint analysis of dual job holding and job mobility is warranted.

E. Hours of Work

Dual job holding is related to higher average annual work hours (table 7, col. 3, and table 8). Furthermore, workers who move in and out of second jobs more frequently have more variable work hours. For example,

Table 8
Hours of Work and Dual Job Holding

	Dual Job Holders			Non Dual Job Holders
	Main Job	Second Job	Total	Main Job
Males—hours levels:				
N			5,307	25,413
Annual hours:				
Median	2,000.0	240.0	2,336.0	2,040.0
Mean	2,013.5	405.9	2,419.4	2,099.1
SD	606.2	467.4	749.2	631.2
Hours/week:				
Median	40.0	15.0	. . .	42.0
Mean	43.5	17.9	. . .	45.3
SD	10.7	17.9	. . .	10.7
Weeks/year:				
Median	49.0	19.0	. . .	49.0
Mean	46.1	24.6	. . .	46.1
SD	7.4	18.8	. . .	8.0
Females–hours levels:				
N			2,142	18,289
Annual hours:				
Median	1,575.0	192.0	1,852.0	1,739.0
Mean	1,488.0	314.7	1,802.7	1,540.6
SD	649.5	344.3	748.9	659.1
Hours/week:				
Median	37.0	12.0	. . .	40.0
Mean	34.0	15.6	. . .	36.0
SD	12.5	12.7	. . .	11.3
Weeks/year:				
Median	48.0	17.0	. . .	48.0
Mean	43.4	22.7	. . .	42.1
SD	9.5	17.7	. . .	11.8

NOTE.—The sample consists of heads or spouses who were not in the poverty subsample, had positive work hours in the survey year, and nonmissing information on dual job holding status and second job hours. Data for females are drawn from 1979–89 only. The definition of hours/week and weeks/year on the second job changes slightly between 1983 and 1984. Up to 1983, dual job holders who had more than one second job were not asked separate questions about hours on each second job, and for these workers reported second job hours presumably reflect an aggregation across all second jobs. After 1983, workers were asked about hours/week and weeks/year on up to two second jobs, but since they were not asked whether multiple second jobs were held simultaneously or sequentially it is not possible to compute hours/week and weeks/year for all second jobs (although second job annual hours can be constructed.) For these later years, second job hours/week and weeks/year refers to time spent on the first second job reported.

the average coefficient of variation of annual work hours is 13.7% for those who never held a second job, and 23.2% for those who held a second job in 7 out of the 14 years. This fact is consistent with the idea that second jobs may be an important source of hours adjustments for workers.

Table 8 and figure 1 compare the distributions by sex of working hours on main and second jobs, for dual job holders and nondual job holders. Several important observations can be made. First, dual job holders have higher average total annual work hours than nondual job holders and slightly lower annual hours on their main jobs. They work on their main

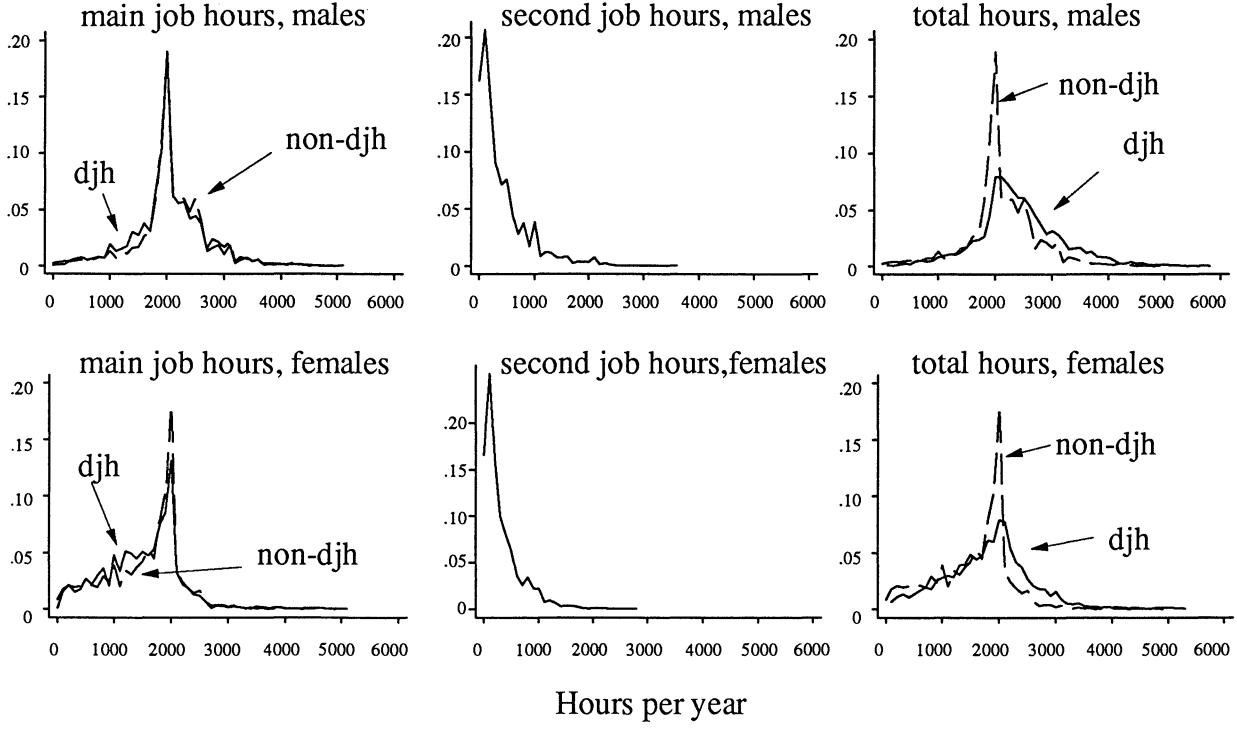

FIG. 1.—Distribution of annual work hours, dual job holders, and nondual job holders

job only about 2 hours per week less than nondual job holders and spend about 15 hours per week on their second job. The spike in their total annual hours is around 2,300 hours for men and 1,850 hours for women. Second, dual job holders spend a large fraction of their working time on second jobs. Average weeks of moonlighting are 24.6 for men and 22.7 for women. Median weeks are 19 and 17 weeks, respectively. Average annual hours on second jobs account for about 17% of total work hours, for both men and women.

Table 9 presents information on the relationship between hours changes and movements into and out of second jobs. These numbers indicate that movements into second jobs are associated with large increases in average total annual hours (roughly 14%) and only negligible reductions in main job hours. Likewise, movements out of second jobs result in large total hours reductions and small increases in main job hours. Similar patterns appear for average hours per week and weeks per year. These numbers are consistent with the results of table 8 and indicate that dual job holding may be an important source of hours adjustment.

F. Hours Constraints, Quits, and Dual Job Holding

In this section we examine the hypothesis that workers use dual job holding and job mobility to adjust their working hours when faced with hours constraints on their main job. Respondents to the PSID were asked if they would have liked to work more (or fewer) hours on their job at the current wage. We use this information to examine whether the patterns of job mobility and dual job holding that are observed can be predicted by hours constraints.

We selected a sample of males from the 1976–89 waves of the PSID who were (1) between the ages of 18 and 65, (2) had positive work hours, and (3) held only one main job and no second jobs in the year before the survey. The series of questions from the PSID on hours constraints were used to construct measures of whether workers wanted to work more (but could not), and whether they wanted to work less (but could not).[6] We then

[6] The questions on hours constraints in the PSID are not ideal. First, workers are asked whether they were constrained on *any* of the jobs they held in the year before the survey. We therefore cannot measure whether workers who changed jobs or held dual jobs faced hours constraints on their *main* job. Second, the questions are sequenced in such a way that individuals who indicate that they would have liked to work more (but could not) were not asked if they would have liked to work less (but could not). It is possible that some workers may have faced upper constraints in part of the year and lower constraints in another part of the year, and the questionnaire would not have picked this up. The number of workers who indicate that they would have liked to work more (but could not) is approximately three times larger than the number who indicate that they would have liked to work less (but could not), and this may be due to the sequence of the

Table 9
Hours Change and Transitions into and out of Dual Job Holding

	$DJH_{t-1} = 0$, $DJH_t = 0$	$DJH_{t-1} = 0$, $DJH_t = 1$	$DJH_{t-1} = 1$, $DJH_t = 0$	$DJH_{t-1} = 1$, $DJH_t = 1$
Males:				
Change in annual hours:				
Main job:				
Median	0	0	35	0
Mean	12.8	−8.0	78.8	23.3
SD	508.6	632.3	599.6	488.9
Second job:				
Median	. . .	160	−160	0
Mean	. . .	302.1	−306.1	11.36
SD	. . .	383.4	386.2	448.9
Total:				
Median	0	200	−155	10
Mean	12.8	294.1	−227.4	34.7
SD	508.6	704.4	691.6	634.3
Change in hours/week:				
Main job:				
Median	0	0	0	0
Mean	.1	−.6	1.1	.2
SD	8.3	10.5	10.2	8.9
Second job:				
Median	. . .	14	−15	0
Mean	. . .	17.7	−18.6	−.2
SD	. . .	15.0	15.5	14.7
Change in weeks/year:				
Main job:				
Median	0	0	0	0
Mean	.2	.6	.6	.3
SD	7.7	9.6	9.1	6.8
Second job:				
Median	. . .	12	−12	0
Mean	. . .	19.4	−18.8	.6
SD	. . .	17.4	17.1	17.8
Observations	19,604	1,584	1,695	2,560
Females:				
Change in annual hours:				
Main job:				
Median	0	0	30	0
Mean	37.3	46.9	65.3	56.8
SD	510.0	608.3	571.5	492.6
Second job:				
Median	. . .	156	−160	0
Mean	. . .	275.8	−274.1	18.7
SD	. . .	330.3	323.9	386.9
Total:				
Median	.0	205.0	−155.0	34.0
Mean	37.3	322.7	−208.8	75.5
SD	510.0	683.8	645.4	602.2
Change in hours/week:				
Main job:				
Median	.0	.0	.0	.0
Mean	.3	−.7	1.4	.8
SD	7.7	11.3	10.5	9.3
Second job:				
Median	. . .	13.0	−14.0	.0
Mean	. . .	15.9	−16.0	−.4
SD	. . .	12.7	12.3	12.7

Table 9 (*Continued*)

	$DJH_{t-1} = 0$, $DJH_t = 0$	$DJH_{t-1} = 0$, $DJH_t = 1$	$DJH_{t-1} = 1$, $DJH_t = 0$	$DJH_{t-1} = 1$, $DJH_t = 1$
Change in weeks/year:				
Main job:				
Median	.0	.0	.0	.0
Mean	.8	2.4	−.1	.8
SD	11.4	11.6	11.6	8.6
Second job:				
Median	...	13.0	−13.0	.0
Mean	...	19.3	−19.4	1.2
SD	...	16.4	16.7	19.1
Observations	13,201	827	857	794

NOTE.—For details, see table 8 notes. DJH = dual job holder.

looked forward 2 years in the data to see which of these men had changed jobs and increased hours, changed jobs and decreased hours, taken second jobs at lower wages (and not quit), taken second jobs at higher wages (and not quit), or had neither changed jobs nor taken second jobs.[7]

questions. Third, it is not clear whether the questions are relevant for salaried workers. To be classified as facing an upper constraint on hours, a worker first had to indicate that no more work hours were available on his job and then indicate that he would have liked to work more. Salaried workers who could have worked more hours, but would have earned no more money from doing extra work, may have indicated that "more work was available" and would therefore be classified as being unconstrained (even if they would have liked to work more had they been paid for doing so). More details are given in the notes to table 10 below. See also Altonji and Paxson (1988) for further discussion of the constraint variables.

[7] The sample consisted of those who had neither quit nor been laid off in t or $t - 2$ and who held no second job in $t - 2$. The job mobility indicator was constructed by seeing if the worker quit to a new job in $t - 1$. Layoffs were excluded from the sample. To see if a quit led to greater or fewer work hours, we compared total annual hours in t with those in $t - 2$. An individual was said to move into dual job holding if a second job was held in t. We then compared the reported wage on the second job in t with the reported wage on the main job in t. We looked forward 2 years, rather than 1, so we could be sure that hours measures referred to one job only, rather than a mixture of two jobs for those who changed jobs. We eliminated those who changed main jobs in t and $t - 2$ so that hours measures would not reflect spells of unemployment between jobs. Dual job holders with missing wages on the second job were excluded. The fraction of dual job holders who report no wage on the second job is high (roughly 40%). Many of these workers were self-employed in their second job or worked on several second jobs in the year before the survey. Estimation of models that include this sample (as a separate outcome) indicates that movements into second jobs with missing wages are not influenced by hours constraints. We did not attempt to do the analysis for women because not all variables are available for wives in 1977 and 1978 and because modeling movements into and out of the labor force poses special difficulties.

We estimated a multinomial logit model with each of these transitions as one possible state. The independent variables (all measured in the base period) included the two indicators of hours constraints, tenure, age, and age squared. The top panel of table 10 shows results from the full sample of workers. The lower panel excludes workers who were salaried in $t - 2$ since it is not clear that the hours constraints variables are meaningful for this group. The results we report do not control for changes in time-varying characteristics of workers (such as marital status, number of children, etc.) on the theory that these variables should influence mobility only through their effects on the discrepancy between desired and actual hours (reflected in the hours constraint indicators). We experimented with adding controls for occupation, the survey year, union status, whether the individual was a government employee, and other personal characteristics such as marital status and number of children. These additions had little effect on the results.

The results in table 10 provide some evidence that hours constraints affect both job mobility and dual job holding. Using the full sample, the variable "wants to work more" is positively and significantly related to taking a second job at a lower wage. The variable "wants to work less" is negatively related to taking a second job at a lower wage and is also positively related to quitting to a main job with lower work hours. However, hours constraints have insignificant effects on quitting and increasing hours and on taking second jobs at higher wages. It may be that those who take second jobs at lower wages do so for different reasons than those who take second jobs at higher wages, and a different model of dual job holding is necessary to explain the behavior of the latter group. The finding that people who want to work more are *not* more likely to quit to jobs with higher work hours is more puzzling. The results shown in the lower panel, which exclude salaried workers, are similar to those in the top panel but have coefficients that are much less precisely estimated.

It should be kept in mind when interpreting these results that the information on hours constraints is far from ideal (see n. 6 above). The questions on which the constraint indicators are based may be interpreted differently from respondent to respondent and may also be "job-specific." For example, a worker who dislikes his current job for reasons *other* than required hours may report that he would "like to work less," even though he might like to work more hours on a more desirable job. This could account for our finding that "wants to work less" is positively (although not significantly) related to quitting to jobs with higher hours. Another potential problem is that workers who face severe hours constraints may change jobs or take second jobs soon after the constraints appear. Our analysis examines mobility behavior in the year *after* constraints are reported. We cannot measure hours constraints in the year the person changed jobs or took a second job since it is then unclear to which job the hours

constraints apply. Our results may therefore underestimate the true effects of hours constraints on job mobility and dual job holding.

III. Theories of Dual Job Holding

The standard textbook model of dual job holding is an hours constraints model (e.g., Perlman 1969). The few papers that have been written on dual job holding and hours constraints have been conducted in a static framework (see, e.g., Shishko and Rostker 1976). The standard assumptions are that individuals cannot increase the hours they work on their main jobs but have the option of taking a second job at a typically lower wage. Workers who want to work more on their main job but cannot will take a second job if the wage on the second job exceeds the shadow wage at the main job hours level.

The evidence presented in Section II above is broadly consistent with the hypothesis that hours constraints motivate dual job holding. First, there is evidence that those who want to work more (but cannot) are more likely to take second jobs. Second, movements into second jobs result in large increases in total hours, movements out of second jobs result in large hours declines, and workers do not decrease their main job hours when they take second jobs. These are the patterns of hours changes one would expect if workers face hours constraints on their main jobs.

There are a variety of other possible reasons for dual job holding in addition to hours constraints. Two jobs could complement each other, where one job is the main source of income while the other provides professional training, contacts, or prestige. Typical examples include physicians who work in a hospital and have a private practice, or professors who engage in consulting. Dual job holding can also be viewed within a portfolio framework. For example, one job might provide a steady but low income, and the second might have wages that are high on average but more variable. Second jobs could also be used by workers to gain experience in or to learn about new occupations.

The diversity of possible reasons for dual job holding is illustrated by data from the CPS survey, which asked dual job holders their reasons for holding a second job. Twenty-nine percent of males (37% of females) answered "to meet regular household expenses," 8% (8.4%) said "to pay off debts," 10% (6%) said "to save for the future," 6.4% (8%) said "extra money for something special," 3.7% (6%) said "to help a friend," 9% (8.5%) said "to get experience in a different occupation or build up business," and 19.7% (16%) said they "enjoy work on second job." The rest specified "other." These answers clearly imply that there are multiple reasons for dual job holding. Of the answers given, the first four are consistent with hours constraints on main jobs and with other models of dual job holding as well. Our finding that a substantial number of workers moonlight in a different occupation than their main job also supports the "complemen-

Table 10
Hours Constraints, Quits, and Transitions into Second Jobs, Multinomial Logit Estimation Results (Standard Errors Are in Parentheses)

Variable	Quit to Higher Hours (1)		Quit to Lower Hours (2)		Take Second Job at Lower Wage (3)		Take Second Job at Higher Wage (4)		Sample Mean (5)
	Estimated Coefficients	Marginal Probabilities	Estimated Coefficients	Marginal Probabilities	Estimated Coefficients	Marginal Probabilities	Estimated Coefficients	Marginal Probabilities	
Full sample (15,251 observations; log likelihood = 6,743):									
Age	−.0558	−.0010	−.0860	−.0005	−.0087	−.0014	−.0015	−.0004	39.8
	(.0392)		(.0433)		(.0363)		(.0334)		
Age²	.0002	...	.0006	...	−.0004	...	−.0002	...	
	(.0005)		(.0005)		(.0004)		(.0004)		
Tenure	−.1549	−.0029	−.1304	−.0012	−.0101	.0003	−.0170	−.0016	7.7
	(.0375)		(.0373)		(.0261)		(.0308)		
Tenure²	.0023	...	.0035	...	.0008	.0000	−.0023	...	
	(.0021)		(.0017)		(.0011)		(.0016)		
Schooling	.0651	.0015	−.0111	−.0003	.0990	.0034	.0812	.0025	12.3
	(.0226)		(.0256)		(.0190)		(.0187)		
Up	.0445	.0009	−.2740	−.0050	.3636	.0131	.0423	.0011	.236
	(.1353)		(.1752)		(.1081)		(.1199)		
Low	.2391	.0066	.5313	.0096	−.7691	−.0280	−.0842	−.0023	.055
	(.2336)		(.2416)		(.3096)		(.2295)		
Constant	−2.0639	−.0446	−1.1661	−.0144	−3.7790	−.1277	−3.8663	−.1207	
	(.7265)		(.8338)		(.6763)		(.6539)		
Observations	327		221		468		431		
P	.0260		.0176		.0372		.0343		

Nonsalaried in $t-2$ (observations = 8,958; log likelihood = −3,714):									
Age	−.0523	−.0010	−.0090	−.0005	.0261	−.0012	−.0095	−.0004	39.6
	(.0497)		(.0601)		(.0469)		(.0410)		
Age^2	.0001	...	.0000	...	−.0008	...	−.0001	...	
	(.0006)		(.0007)		(.0006)		(.0005)		
Tenure	−.1477	−.0027	−.1563	−.0011	.0083	.0000	−.0548	−.0022	7.3
	(.0521)		(.0476)		(.0371)		(.0445)		
Tenure^2	.0013	...	.0049	...	−.0010	...	−.0023	...	
	(.0032)		(.0021)		(.0018)		(.0026)		
Schooling	.0366	.0006	−.0617	−.0010	.1050	.0030	.1232	.0031	11.3
	(.0319)		(.0364)		(.0273)		(.0268)		
Up	.0999	.0019	−.2731	−.0040	.3769	.0110	.1447	.0035	.308
	(.1578)		(.2083)		(.1306)		(.1446)		
Low	.0550	.0014	.4721	.0068	−.7215	−.0215	.2121	.0059	.046
	(.3724)		(.3568)		(.4585)		(.3068)		
Constant	−1.6934	−.0302	−1.8757	−.0221	−4.4741	−.0126	−4.1191	−.1028	
	(.9354)		(1.1671)		(.8830)		(.8271)		
Observations	195		126		271		242		
P	.0218		.0141		.0302		.0270		

NOTE.—The basic sample is of male heads of households who (1) were not dual job holders in $t-2$, (2) did not change their main jobs in t or $t-2$, and (3) were not laid off in $t-1$. QUIT = 1 if a quit occurred in $t-1$. TAKE 2d = 1 if the individual held a second job in t and did not quit. Hours increases and decreases are based on total annual work hours. Four percent of the sample who quit and did not change hours were included in category 1; putting them in category 2 did not change the results. "Higher wage" and "Lower wage" refers to whether the second job wage is higher or lower than the main job wage. Observations for which second job wages were missing were excluded. All controls were measured in $t-2$. Marginal probability is calculated as $P_j[\beta_j - \Sigma_k p_k\beta_k]$. The coefficients for state no. 5 (no quits and no dual job holding) are normalized to be zeros. Construction of "hours constraints" variables: the set of questions in 1976–78 is different than that in 1978–87 (in 1988 and 1989 these questions were not asked). These are the questions asked in 1976–78: (1) "Was there more work available on (your job/any of your jobs) so that you could have worked more if you had wanted to?" If the answer to (1) was "no," then the respondent was asked, (2) "Would you have liked to work more if you could have found more work?" If the answer to (1) was "yes," then the respondent was asked, (3) "Could you have worked less if you had wanted to?" If the answer to (3) was "no," the respondent was asked, (4) "Would you have preferred to work less even if you had earned less money?" Starting in 1979, the order of the questions is changed, and two additional questions are asked. Specifically, those who indicated that they face upper hours constraints were asked whether they could work less, and (if not) whether they wanted less work. We use the above input variables to construct the following variables that we use in the analysis: (1) UP = 1 if the respondent cannot work more and wants to, UP = 0 if the respondent does not want to work more, whether one can work more or not. (2) LOW = 1 if the respondent cannot work less and wants to, LOW = 0 if the respondent does not want to work less, whether one can or not. Notice that it is not possible to construct values for the lower constraints (i.e., for those who want to work less but cannot) that are comparable across survey years. Note, also, that before 1979, "low" is problematic: people who said they wanted to work more but could not were never asked whether they wanted to work less and could not. We assume that (for these years) such people did not want to work less.

tarity" and "portfolio" hypotheses (although it does not contradict the hours constraints model). However, the fact that most dual job holders do not work less on their main jobs is inconsistent with these explanations.

Although the data appear to be broadly consistent with the textbook "hours constraints" model of dual job holding, there are several issues that this simple model does not address. First, it does not explain how workers come to be working in main jobs with hours that are unsatisfactory: the choice of the main job (and the hours that go along with it) are taken to be exogenous. Second, it does not explain why workers do not change main jobs to avoid hours constraints, rather than take second jobs. These questions can only be addressed by a dynamic model, which we develop in the next section.

IV. A Model of Job Mobility and Dual Job Holding

A. Overview of the Model

Two key ideas underlie our analysis of dual job holding and job mobility. First, we start with the idea that hours adjustments cannot be made within jobs. The truth of this assumption is likely to vary from job to job. However, there are both theoretical reasons and empirical evidence in support of the idea that hours constraints may be prevalent.[8] If hours cannot be adjusted within jobs, then workers who want to work greater or fewer hours must change jobs (or add or drop second jobs) in order to alleviate hours constraints. Furthermore, if jobs are costly to change, then workers may continue in jobs with unsatisfactory hours.[9] Data from the PSID support this idea. In any given year, approximately 30% of employed males report dissatisfaction with their work hours.[10]

The second key point in the model is that desired hours of work vary over time. Some of this variation may be predictable, reflecting life-cycle changes in desired hours. However, a portion of the variation in desired work hours may be random. The idea is that desired hours are determined by a set of individual-specific factors (in addition to the wage) that affect the value of leisure relative to consumption and that these factors can vary unexpectedly. For example, nonwage labor supply determinants might

[8] See Card (1987) for a survey. Further references on the theoretical literature are in Altonji and Paxson (1992). Empirical studies include Ham (1979, 1982, 1986), Gustmann and Steinmeier (1983, 1984), Moffitt (1984), and Kahn and Lang (1987). Siow (1990) argues that workers whose hours differ from those they work will incur wage penalties.

[9] Costs might include search costs, forgone returns to firm-specific human capital, or lost deferred benefits, such as pensions.

[10] Similar findings on the frequency of hours constraints, using other data sets, both in the United States and other countries, were made by Katona, Strumpel, and Zahn (1971) and Bell and Freeman (1994).

include such things as the value of financial wealth, the health status of the worker or of family members, marital status, and number of children. Variations in each of these factors over time contain random elements, producing stochastic variations in desired work hours. A good example might be changes in the employment status of a spouse: if one spouse unexpectedly loses a job, the other might want to increase work hours, at least until the spouse can find a new job (see Krishnan 1990). Imperfections in either insurance or credit markets may accentuate the links between changes in labor supply determinants and desired hours. For example, with perfect credit markets, the effects of a spouse's job loss on consumption can be spread over the full lifetime of the household. For credit-constrained consumers, however, the effect of such a job loss on current consumption will be much larger unless the other spouse increases his work hours.

In Subsection IVB below, we analyze how stochastic preferences, together with inflexible hours within jobs and mobility costs, affect job mobility decisions when dual job holding is not an option. Inflexible hours within jobs and costs associated with changing jobs imply that desired hours and actual hours within a job may at times diverge. Controlling for wages, workers will change to new jobs only if the expected gain in welfare due to having more desirable hours outweighs the fixed cost of mobility. The implication is that there will be a *range* of work hours around desired hours that, if required by the employer, would not provoke a job change. The presence of stochastic, rather than static, preferences will generally broaden the range of hours over which no mobility occurs. With ongoing uncertainty as to what desired hours will be in the future, workers will take into account the positive probability that desired hours will move back toward current work hours sometime in the future. Specifically, the presence of uncertainty increases the value of not changing jobs (despite current hours constraints) and waiting to see how desired hours continue to evolve in the future. Furthermore, if future desired hours are uncertain, workers who do change jobs may choose hours on their new jobs differently than if expectations had been static.

In Subsection IVC below, we allow for the possibility that second jobs can be used by workers to alleviate hours constraints. The major assumption made is that workers can always find, at no cost, a lower wage job at any hours level. The addition of second jobs alters the analysis of job mobility in several respects. First, for workers who are dissatisfied with their hours, dual job holding and job mobility represent alternative methods of adjusting hours. In general, the availability of second jobs should lower mobility. Second, dual jobs add asymmetry to the model. Second jobs can be used to increase but not reduce hours. This fact has implications for the hours levels workers will choose given that they change main jobs. Specifically, the availability of second jobs reduces the cost of choosing a new main

job with "low" hours since the worker knows that hours can be supplemented with a second job if necessary.

The ideas discussed above are similar to those in a series of papers on topics such as pricing decisions, *S-s* inventory decisions, and investment decisions.[11] All of these papers investigate adjustment behavior in the presence of fixed costs in a stochastic dynamic setting. For example, in the menu cost model developed in Dixit (1991*a*), firms must decide whether to adjust their prices (at a fixed cost), given that the general price level follows a stochastic process. In the model presented in this article, workers must decide whether to adjust hours (by changing jobs) at a fixed cost, given that desired hours follow a stochastic process. Our model offers a twist on those in the papers cited above in that there is more than one method of adjustment available: workers may change their work hours by changing jobs or by moving into and out of second jobs. Second jobs operate as release valves for hours constraints, and the availability of second jobs should result in less job mobility.

Our model is also similar in some respects to the theory of job matching and turnover (Jovanovic 1979). For example, in the Jovanovic model job mobility is driven by the discrepancy between the value of the current job relative to outside opportunities, where the value of the job match is a function of the worker's productivity on the job. In this model, the true value of the job match is fixed but, ex ante, not known. Workers and employers learn more about the value of the match over time. In the context of our model, a "good match" can be interpreted as a job in which desired hours match required hours. However, unlike that in the Jovanovic model, the value of a job match is stochastic and varies as desired hours evolve. Moreover, opportunities for dual job holding also affect the value of the current match since dual job holding provides dissatisfied workers with an alternative means of changing work hours.

In the following subsections we sketch a model that shows how workers make job mobility and dual job holding decisions. For ease of exposition we do not provide all the technical details of the model (which are available in Paxson and Sicherman [1992]). We also discuss the assumptions we make about functional forms to yield tractable results. The model should be thought of as a specific example, which can be used to illustrate the general points discussed above.

B. A Model of Job Mobility with No Second Jobs

We begin by developing a model of job mobility when second jobs cannot be used to increase hours. This model is then modified to allow for dual job holding.

[11] For example, Grossman and Laroque (1990); Caplin and Leahy (1991); and Dixit (1991*a*, 1991*b*, 1992).

The basic assumptions of the model are that (1) the preferred hours level is stochastic, (2) the wage rate is fixed, and (3) work hours are inflexible within jobs but can be altered to any level by changing jobs at a fixed cost. The rationale for the first of these assumptions was discussed above. The assumption of a fixed wage rate is made to focus attention on mobility due to changes in desired hours. The third assumption, of fixed hours within jobs, is obviously somewhat unrealistic. Even if firms fix the hours that workers must provide, firms may change required work hours in response to fluctuations in output demand. We discuss, below, how the model can be altered to allow for fluctuations in required work hours.

The worker's instantaneous utility function is represented as

$$U_t = wH_t - \beta(X_t)H_t^2, \tag{1}$$

where H_t is hours of work at time t and w is the wage rate; X_t is a set of stochastic labor supply determinants, and $\beta(X_t)$ measures the effects of these variables on the marginal utility of work hours. In what follows, $\beta(X_t)$ will be shortened to β_t. However, it should be kept in mind that we do not consider the underlying parameters of the utility function to be stochastic. Variations in β_t do not represent variations in tastes but, rather, changes in the labor supply variables X_t. The utility function that is chosen is linear in consumption but concave (specifically, quadratic) in work hours. This utility function is actually less restrictive than it appears to be. For example, a utility function that is quadratic in both consumption and hours can be written in the form of equation (1) if the worker earns no nonlabor income.[12] However, it should be noted that we assume that there is neither borrowing nor lending, so that wH_t equals consumption. The model would be much more difficult to solve without this assumption since savings and job mobility decisions would be jointly determined.

If changing jobs was costless, or if hours were perfectly flexible within jobs, then hours would be chosen at each instant simply by maximizing (1) with respect to H_t, given β_t. The result of this maximization yields a desired hours level H_t^* equal to $w/2\beta_t$. It is useful, in what follows, to express the utility function in terms of H_t^* rather than β_t:

$$U_t = \frac{wH_t^*}{2}[2x_t - x_t^2], \tag{2}$$

where x_t is the ratio of actual to desired hours ($x_t = H_t/H_t^*$).

[12] Specifically, suppose that $U_t = wH_t - \alpha_{1t}(wH_t)^2 - \alpha_{2t}H_t^*$. Define $\beta_t = (\alpha_1 w^2 + \alpha_2)$ to get a utility function of the same form as that specified in (1).

The assumptions that hours are inflexible within jobs and that there are costs associated with changing jobs imply that workers will not always work hours equal to H_t^*. Instead, workers will change hours (and jobs) only if the expected welfare gain associated with the change exceeds the fixed cost of the change. Furthermore, the worker makes this decision knowing that desired hours will continue to evolve in the future. The value function associated with this maximization problem can be written as

$$V(H, H^*) = \max E\left\{\int_0^\infty [(w/2)H_t^*(2x_t - x_t^2)]e^{-rt}dt - \sum_i Ke^{-rt_i}\right\}, \quad (3)$$

where initial hours and desired hours are denoted as H and H^*, respectively, r is the interest rate, K is the cost of changing jobs, and t_i denotes the times at which the job is changed. Thus, given initial values for hours and desired hours, the worker must decide both whether to change jobs and, if so, what hours level to pick on the new job.

In order to derive a solution for the worker's optimization problem, the stochastic process that H^* follows must be specified. We assume that desired hours follows a geometric Brownian motion,[13] such that

$$\frac{dH^*}{H^*} = \mu dt + \sigma dz. \quad (4)$$

Equation (4) implies that the logarithm of desired hours follows an arithmetic Brownian motion with a trend term of $\mu - (1/2)\sigma^2$ and variance of σ^2. The basic assumption underlying this choice of stochastic process is that random changes in the variables X_t that underlie the change in desired hours display a great deal of persistence. This seems to be a sensible assumption for some variables, such as changes in financial wealth or health status, that might drive movements in desired hours. However, one can also imagine desired hours following a process that is much less persistent. For example, desired hours could fluctuate randomly around a fixed mean, with no correlation in desired hours across years. In general, the greater the degree of persistence in desired hours, the more attractive job mobility will be given a discrepancy between desired and actual hours.

The solution to (3) consists of three numbers, denoted x_1, x_2, and x_3, where $x_1 < x_2 < x_3$. The term x_1 is defined as the lowest ratio of actual to desired hours that will not induce a job change: if desired hours rise enough such that H/H^* is less than x_1, the worker will quit to a new job with

[13] A simple Brownian motion can be derived as the continuous limit of a discrete-time random walk. For the usefulness and various uses of geometric Brownian motion, see Dixit and Pindyck (1994).

higher hours. Likewise, x_3 is the highest acceptable ratio of actual to desired hours. If H/H^* rises above x_3, the worker moves to a new job with lower hours. The term x_2 describes the ratio of actual to desired hours that will be chosen given that the job is changed. Thus, if a change is made, new hours are chosen such that $H = H^*x_2$.

In Paxson and Sicherman (1992), we solve the model, discuss some of the assumptions we make, and use simulations to analyze its implications.[14] In what follows we present our main results.

The first result is that there is a wide range of desired hours over which hours are not changed. Increases in the costs of mobility widen the range of inactivity and reduce the quit probability. Even a very modest cost results in a substantial range of inactivity. For example, with no trend in desired hours (and relatively low variance of $\sigma = .05$) and a discount rate of 10%, a mobility cost of only 2.5% of income can generate a range of inactivity where individuals will not quit until actual hours are less than 78% of desired hours or more than 126% of desired hours.

Second, an increase in the variance of desired hours results in a wider range of inaction. However, an increase in the variance of desired hours *increases* the probability that a quit will occur. Thus, although individuals with more variable hours will accept larger deviations between actual and desired hours, the increase in x_3 and reduction in x_1 is not large enough to reduce the quit probability. Our finding of a positive correlation between the coefficient of variation of annual hours of work and quit probabilities supports this result.

As might be expected, trends in desired hours have an asymmetric effect on x_1 and x_3. An individual who expects desired hours to fall over time will be less likely to quit from a job that demands fewer hours than are currently desired and more likely to quit from a job that demands more hours than are currently desired. Furthermore, positive trends in desired hours are associated with higher hours choices given that a quit occurs, and negative trends result in lower hours choices given a quit. Overall, larger absolute trends in desired hours result in higher quit rates.

How does the model change if the hours required by firms are allowed to vary? Adding variability in required hours does little to alter the basic implications of the model. Workers make mobility decisions taking into account the fact that hours constraints on the current job may be alleviated in the future, through changes in either required or desired hours. We do not extend the analysis to the case in which the hours required by all firms fluctuate together (owing to, e.g., common macroeconomic shocks). Economywide fluctuations in hours requirements are likely to produce econ-

[14] Due to the nature of the problem, a closed-form solution for x_1, x_2, and x_3 cannot be derived. As is commonly done, we use simulations as a substitute.

omywide fluctuations in the real wage, calling for a model in which wages are endogenously determined.

The solutions to the problem with and without variation in required hours are similar. The major differences are as follows. First, the worker takes into account variability in both his desired hours and in required hours when making mobility decisions. In all of the equations presented above, it is the *sum* of these variances that affects mobility decisions and the choice of hours. Second, trends in required and desired hours have opposite effects on mobility decisions. Workers will be more likely to separate when the different trends diverge. As expected, trends in required hours produce asymmetric effects in x_1 and x_3. All else being equal, workers who want to work more will be less likely to quit if required hours trend up and more likely to quit if required hours trend down.

C. The Model with Second Jobs

Next, we modify the model described above to allow for dual job holding. For simplicity, we assume that required hours are nonstochastic, although extending the model to allow for stochastic variation in required hours is straightforward. Assume that (1) second jobs are costless to obtain, and (2) the wage on second jobs is lower than that on main jobs. The assumption that second jobs are costless to obtain implies that hours constraints on second jobs do not exist: even if a specific second job has a fixed hours requirement, the worker can easily move to a different second job if a different hours level is desired. The assumption that the wage on the second job is less than the wage on the main job is crucial. Without this assumption, workers would always prefer to take second jobs as their main jobs, and no one would face hours constraints. The data presented in tables 5 and 6 indicate that, although for many workers second job wages are lower than main job wages, this is not true for all workers, especially those in more skilled occupations. It should also be kept in mind, however, that our calculations of relative wages ignore fringe benefits that are likely to be much more important on main jobs, and the ratio of the second job wage to the main job wage is likely to be overestimated.

The addition of second jobs means that the utility function becomes

$$U_t = wH_t + w_2H_{2t} - \beta_t(H_t + H_{2t})^2, \tag{5}$$

where w_2 is the second job wage, and H_{2t} is the hours on the second job.

Since hours on the second job are perfectly flexible, H_{2t} will be chosen to maximize utility at each instant. The solution for H_{2t} is

$$H_{2t}^* = \max(\lambda H_t^* - H_t, 0), \tag{6}$$

where λ is the ratio of the second job wage to the main job wage ($\lambda = w_2/w$). By assumption, λ is less than one. Equation (6) implies that the worker will take a second job only if $x_t < \lambda$.

The solution to the worker's maximization problems consists of three numbers, which will now be denoted xx_1, xx_2, and xx_3 to distinguish them from the solutions when there is no dual job holding. As before, these three numbers denote the minimum acceptable ratio of actual to desired hours, the ratio of actual to desired hours chosen in the case of a quit, and the maximum acceptable ratio of actual to desired hours. There are three possible types of solutions for xx_1–xx_3:

CASE 1. $\lambda < xx_1 < xx_2 < xx_3$. The worker will never accept a second job. If desired hours increase relative to actual hours such that $x < xx_1$, the worker will prefer to change to a new job rather than accept a second job. In this case, the solutions for xx_1, xx_2, and xx_3 are identical to the solutions for x_1, x_2, and x_3.

CASE 2. $xx_1 < \lambda < xx_2 < xx_3$. In this case, the worker will take a second job if x lies between xx_1 and λ. However, when the worker does change to a new job, any second job previously held will be quit. In other words, at the optimal hours level given that a quit takes place the worker will not want a second job.

CASE 3. $xx_1 < xx_2 < \lambda < xx_3$. In this case, as in case 2, the worker will hold a second job if $x < \lambda$. Furthermore, since xx_2 is less than λ, the worker who quits for a new main job will also simultaneously take a second job, even if a second job was not held before the quit. For example, a person for whom x exceeds xx_3 (indicating that the person wants to work less on the main job) will quit for a new main job with lower hours *and* take a second job to supplement hours. Such behavior, which may seem odd, actually makes sense in the context of a dynamic model. The worker may prefer to move to main jobs with lower-than-desired hours to guard against the possibility that desired hours decline in the future and supplement these hours with a second job.

Simulations of xx_1, xx_2, and xx_3 show that the availability of second jobs affects the quit rate from the main job. Specifically, as the wage on the second job relative to that on the main job increases, the quit probability declines. Furthermore, increases in the second job wage have asymmetric effects on the threshold levels of hours at which a quit occurs. As λ increases, xx_1, xx_2, and xx_3 decline. In words, as the wage opportunities on second jobs rise, workers become more willing to stay in jobs that require fewer hours than are desired, less willing to stay in jobs that require greater than desired hours, and will choose new jobs with lower hours levels (relative to desired hours). As λ increases, the decline in xx_1 is much larger than the decline in xx_3, and the probability that a quit occurs declines. Thus, workers who can command high wages on second jobs should have less mobility in their main jobs, all else being equal.

As might be expected, increases in the variance of desired hours increase both job mobility and dual job holding. Workers with "unstable" desired hours are more likely to move from main job to main job, and into and out of second jobs. This finding is consistent with the evidence in table 7, which shows that the group of people who move into and out of second jobs frequently also change main jobs frequently. In the context of this model, these people would be characterized as those with highly variable desired hours levels.

Another prediction of the model is that increases in the costs of changing jobs reduce job mobility and increase the probability of dual job holding. Again, this is consistent with the evidence in table 7. Those workers who consistently hold second jobs year after year (but who change main jobs infrequently) should be those with high mobility costs. It should be noted that if costs are low enough, workers may choose never to hold second jobs (as in case 1 above).

As in the case of no dual job holding, trends in hours increase mobility rates between jobs. However, the effects of trends in desired hours on rates of dual job holding depend on the value of λ chosen. When λ is relatively low, workers with downward trends in desired hours are less likely to hold second jobs, and workers with upward trends are more likely to hold second jobs. By contrast, when λ is close to 1, workers with downward trends hold second jobs *more* frequently than workers with no trends. The reason is that, with high λ, workers who quit will simultaneously take a second job (i.e., $x_2 < \lambda$). This is the outcome described in case 3 above. The pattern for workers with downward trends in hours and high λ is to quit for a new main job with lower hours, take a second job to supplement hours, and then give up the second job as desired hours continue to fall. When λ is low, workers who quit and reduce main job hours do *not* simultaneously take a second job. Therefore, downward trends in desired hours reduce the likelihood of dual job holding.

The model also yields predictions about the relationship between job tenure and the likelihood of dual job holding. However, the nature of these predictions depends on which of the three cases described above is applicable. In case 1, individuals never hold second jobs, and so the probability of holding a second job is zero at all tenure levels. In case 2, when individuals choose new main jobs, they do not simultaneously take second jobs, so when tenure is zero the probability of dual job holding is also zero. The likelihood of dual job holding rises with tenure since the probability that desired hours rise to the threshold at which second jobs are accepted increases over time. In case 3, individuals with new main jobs also hold second jobs, and the probability of being a dual job holder falls with tenure.

The data provide little guidance as to which of these cases is most relevant. As seen in table 10, there is not a strong relationship between tenure and

dual job holding. The effect of tenure on the probability of taking a second job at a lower wage is positive (when evaluated at sample means) but is also quite small; the effect is negative (at sample means) and small for those who take second jobs at higher wages. These results could reflect underlying heterogeneity in the data, so that for some individuals the probability of dual job holding rises with tenure whereas for others it does not. It may also be that many of the parameters of the model change with tenure. For example, workers with more seniority may have greater mobility costs due to greater firm-specific human capital, or they may have more flexible required work hours. In this case the range of desired hours over which a second job is accepted would change with tenure. Our model cannot account for these effects since the parameters of the model are assumed to remain constant over time.

V. Conclusions

The commonly cited rate of dual job holding in the United States is around 6%. This rate is based on data drawn from the CPS, where individuals are asked about their employment in the week prior to the survey. However, the incidence of dual job holding increases as one looks over longer time periods. Using the PSID, we find that in any one year roughly 20% of working males and 12% of working females hold a second job in addition to their main job. More than 50% of working men hold a second job sometime during their working lives. There is also a great deal of movement into and out of dual job holding. Mobility into and out of second jobs is associated with large changes in weekly and annual hours, and there is evidence that dual job holding is prompted by hours constraints on the main job.

Much of the empirical literature on second jobs is motivated by a simple model of labor supply in which workers face upper constraints on main job hours: a worker who would like to work more on his main job, but cannot, will take a second job provided the second job wage is high enough. Such models do not account for the fact that workers may also avoid hours constraints by finding new main jobs with higher hours. We develop a stochastic dynamic model of dual job holding and job mobility in which decisions to take second jobs and/or change main jobs are made simultaneously. This model is consistent with our findings, especially those that are not dealt with in a static framework: namely, that dual job holding is a prevalent and dynamic process, that workers move into and out of dual job holding along their working careers, that both dual job holding and job change are used to adjust hours of work, and that a discrepancy between working hours and desired hours of work is a common phenomenon.

References

Altonji, Joseph, and Paxson, Christina H. "Labor Supply, Hours Constraints, and Hours Wages Trade-off." *Journal of Labor Economics* 6 (1988): 254–76.

———. "Labor Supply, Hours Constraints and Job Mobility." *Journal of Human Resources* 27 (Spring 1992): 256–78.

Bell, Linda, and Freeman, Richard. "Why Do Americans and Germans Work Different Hours?" Working Paper no. 4808. Cambridge, MA: National Bureau of Economic Research, July 1994.

Brown, James N., and Light, Audrey. "Interpreting Panel Data on Job Tenure." *Journal of Labor Economics* 10 (July 1992): 219–57.

Caplin, Andrew, and Leahy, John. "State Dependent Pricing and the Dynamics of Money and Output." *Quarterly Journal of Economics,* 106, no. 3 (August 1991): 683–708.

Card, David. "Supply and Demand in the Labor Market." Industrial Relations Section Working Paper no. 228. Princeton, NJ: Princeton University, November 1987.

———. "Analytical Approximations in Models of Hysteresis." *Review of Economic Studies* 58 (1991): 141–51. (*a*)

Dixit, Avinash. "Irreversible Investment with Price Ceilings." *Journal of Political Economy* 99, no. 3 (June 1991): 541–57. (*b*)

———. "Investment and Hysteresis." *Journal of Economic Perspectives* 6, no. 1 (Winter 1992): 107–32.

Dixit, Avinash, and Pindyck, Robert. *Investment under Uncertainty.* Princeton, NJ: Princeton University Press, 1994.

Grossman, Stanford J., and Laroque, Guy. "Asset Pricing and Optimal Portfolio Choice in the Presence of Illiquid Durable Consumption Goods." *Econometrica* 58, no. 1 (January 1990): 25–51.

Gustman, A., and Steinmeier, T. "Minimum Hours Constraints and Retirement Behavior." *Contemporary Policy Issues* 1, no. 3 (July 1983): 77–91.

———. "Partial Retirement and the Analysis of Retirement Behavior." *Industrial and Labor Relations Review* 37 (1984): 403–15.

Ham, J. "Rationing and the Supply of Labor: An Econometric Approach." Industrial Relations Section Working Paper no. 103A. Princeton, NJ: Princeton University, May 1979.

———. "Estimation of a Labor Supply Model with Censoring due to Unemployment and Underemployment." *Review of Economic Studies* 49 (1982): 335–54.

———. "Testing Whether Unemployment Represents Life-Cycle Labor Supply." *Review of Economic Studies* 53 (1986): 559–78.

Jovanovic, Boyan. "Job Matching and the Theory of Turnover." *Journal of Political Economy* 87 (October 1979): 972–90.

Kahn, S., and Lang, K. "Constraints on the Choice of Work Hours: Agency versus Specific Capital." Working Paper no. 2356. Cambridge, MA: National Bureau of Economic Research, 1987.

Katona, G.; Strumpel, B.; and Zahn, E. *Aspirations and Affluence: Comparative Studies in the U.S. and Western Europe.* New York: McGraw-Hill, 1971.

Krishnan, Pramila. "The Economics of Moonlighting: A Double Self-Selection Model." *Review of Economics and Statistics* 72 (May 1990): 361–67.

Moffitt, R. "The Estimation of a Joint Wage-Hours Labor Supply Model." *Journal of Labor Economics* 2 (1984): 550–66.

Morgan, James N.; Duncan, Greg J.; Hill, Martha S.; and Lepkowski, James. *Panel Study of Income Dynamics, 1968–1989* (Waves I–XXII) (computer file). Ann Arbor, MI: Survey Research Center (producer), Inter-University Consortium for Political and Social Research (distributor), 1992.

Paxson, Christina H., and Sicherman, Nachum. "The Dynamics of Job Mobility and Dual-Job Holding." First Boston Working Paper no. FB-92-04. New York: Columbia University, January 1992.

Perlman, Richard. *Labor Theory.* New York: Wiley, 1969.

Shishko, Robert, and Rostker, Bernard. "The Economics of Multiple Job Holding." *American Economic Review* 66 (June 1976): 298–308.

Siow, Aloysius. "The Use of Wages in Coordinating Hours of Work." Unpublished manuscript. New York: Columbia University, 1990.

U.S. Bureau of Labor Statistics. "News Bulletin." USDL no. 91-547. Washington, DC: Government Printing Office, October 1991.