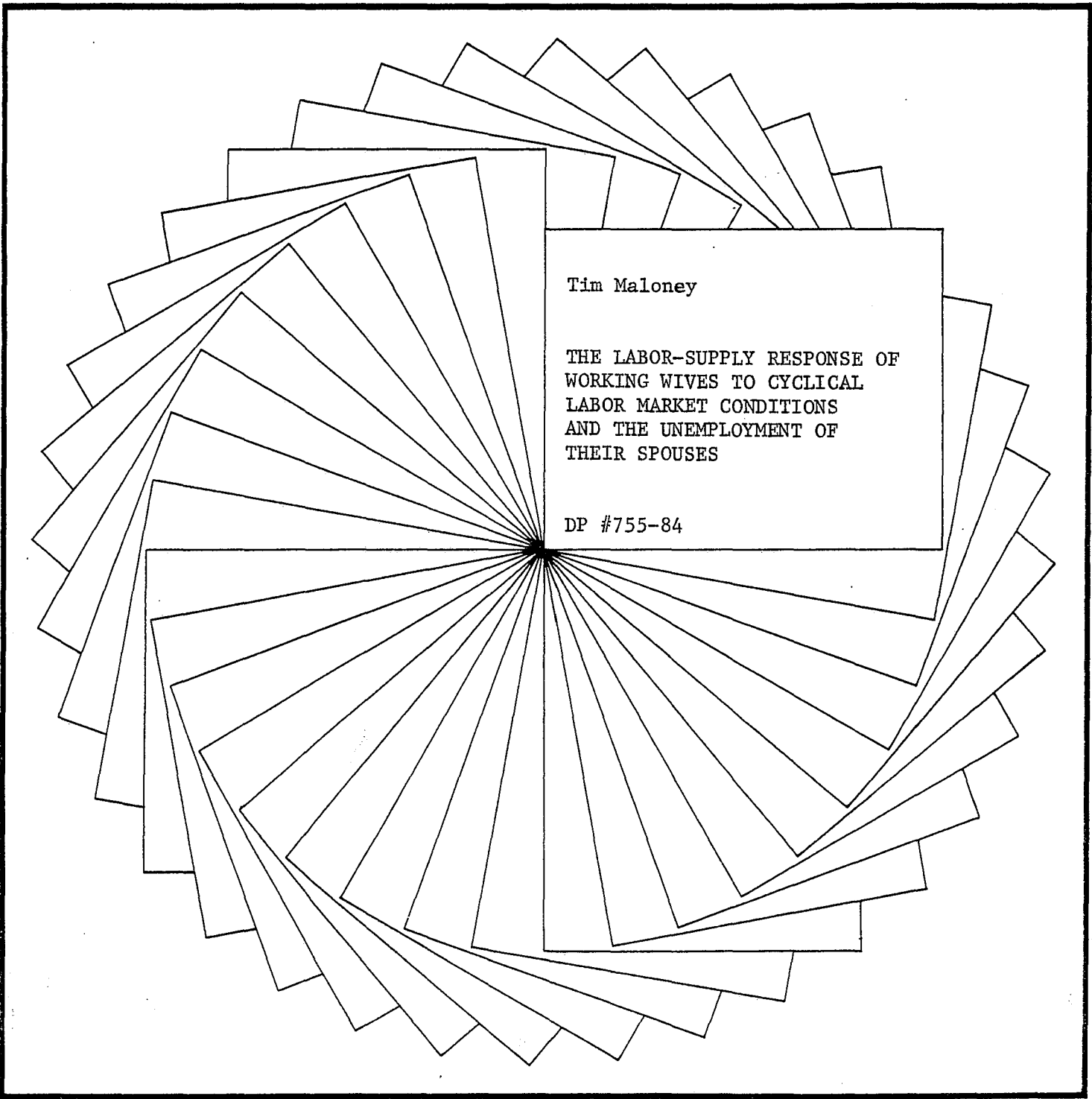# IRP Discussion Papers

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WORKING WIVES TO CYCLICAL
LABOR MARKET CONDITIONS
AND THE UNEMPLOYMENT OF
THEIR SPOUSES

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THE LABOR-SUPPLY RESPONSE OF WORKING WIVES
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ABSTRACT

This study analyzes the cyclical and short-term determinants of the labor supply of married women in two-earner families. Working wives often face conflicting signals in responding to cyclical downturns in labor market conditions and the unemployment of their spouses; they may, for example, want to increase hours of work because of lower family income but find themselves unable to do so because of poor labor market conditions. A sample of married couples taken from the Michigan Panel Study of Income Dynamics is used to disentangle the determinants of this labor supply behavior.

The analysis finds that married women who worked in each of six successive years (1975-1980) reduced their hours of work during recessionary periods. The assumption that the unemployment of husbands encourages their wives to work more hours in the labor market is not borne out by this study. Wives tended to work _fewer_ hours in the years that their spouses experienced unemployment. This result may be caused by unmeasured local demand conditions that brought about the husband's unemployment and also limited or discouraged the wife's ability to work in the marketplace. Examples of local demand conditions not fully captured by measured unemployment rates might be the concurrent layoffs of the spouses in the same industry, or the indirect impact that the husband's layoff would have on the wife's employment opportunities in the immediate area.

THE LABOR-SUPPLY RESPONSE OF WORKING WIVES
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The involvement of married women in the labor market has increased steadily over the past few decades. About 30 percent of wives whose husbands were present participated in the labor force in 1960. By 1980 this figure had grown to more than 50 percent. Consequently, there has been a proliferation in two-earner families in society, and in 1981 the labor market earnings of wives constituted more than 25 percent of total family income.[1] It has become increasingly important to understand the labor supply behavior of these working wives.

This study examines the cyclical and transitory determinants of the labor supply of a group of married women who maintained their attachment to employment over an observed portion of their lifetimes. Two particular factors affecting this labor supply behavior are considered: the impact of labor market conditions and the effect of unemployment experienced by the husbands.

A sample of married couples is chosen from the Panel Study of Income Dynamics (PSID) and followed over a six-year period. With family-specific data, we can observe the wife's response to local labor market conditions and a variety of personal and family circumstances. With multiple observations, the transitory and permanent determinants of this behavior can be disentangled.

The motivation for this study comes from earlier research on family-specific income fluctuations (Gottschalk and Maloney, 1983). In supplemental regressions it was found that family incomes dropped precipitously with the unemployment of the husband, even among two-earner families

(similar results from the sample in the present study are reported in Appendix I). Given that transfer payments replace some of the lost income and that other family members have an incentive to increase their own labor market earnings during this period, the severity of the decline in family income was surprising. This study suggests a reason for so large a drop in family income when the husband becomes unemployed.

Married women in this sample tended to reduce their yearly hours of market work during recessionary periods. This supports the often-noted procyclical nature of labor supply behavior and is termed the "diminished work" effect for this group of working wives. It is hypothesized that a husband's unemployment encourages a concurrent increase in hours worked by the wife, termed the "additional work" effect.[2] This study finds no evidence of the additional work effect; instead, the average married woman reduced her hours of work in years in which her spouse experienced unemployment. This negative effect diminished considerably, however, when we used a broader measure of the wife's labor supply, adding together hours of employment and unemployment on the assumption that this represented "desired" hours of work. This measure suggests that married women may respond to the unemployment of their spouses by actively searching for employment. Yet even under this more comprehensive defini-tion, there was no evidence that the overall labor supply of the wife expanded with the unemployment of her husband.

Perhaps this unexpected result is caused by unmeasured local labor market conditions that influence both the husband's unemployment and the wife's labor supply. Measured unemployment rates do not fully capture the local demand conditions that affect labor supply decisions. The unemployment experienced by the male spouse may be a proxy for these

unmeasured conditions and capture another component of the general diminished work effect. Overall local labor market conditions not only cause the average working wife to experience unemployment in the same period as her husband, but also may encourage her to drop out of the labor force for a time.

CONCEPTUAL FRAMEWORK

A general conceptual framework underlies the reduced-form, empirical model developed in the next section. The goal of the brief theoretical discussion in this section is to analyze static models of family labor-supply behavior when labor market conditions may constrain the hours of work that can be effectively supplied to the marketplace by either spouse. In this way, the diminished work and additional work effects influencing the hours decisions of working wives are made more explicit. The life-cycle nature of these labor supply decisions is then taken into consideration.

Case 1: Labor Supply with No Constraints on Hours Worked

The family is assumed to maximize the joint utility of its members in a single period. For simplicity, the family consists solely of a husband and wife.

$$(1) \quad U = u(L_h, L_w, C),$$

where L_h and L_w represent the time spent in nonmarket activity by the husband and wife, respectively, and C is some composition of all goods and services consumed by the family in this period.

Maximization of this utility function is subject to the following budget constraint:

(2) $C = W_h H_h + W_w H_w + Y,$

where consumption is set equal to income generated in this period. Family income is a function of exogenously determined wages for both spouses (W_h, W_w), their hours of market work (H_h, H_w), and nonlabor family income (Y).

Assuming interior solutions, the familiar labor-supply functions are produced (Ashenfelter and Heckman, 1974):

(3) $H_h = f_h(W_h, W_w, Y),$

(4) $H_w = f_w(W_h, W_w, Y).$

For either spouse, hours of market work are determined by the wages of both spouses and nonlabor income. These are generally termed the own-wage and cross-wage substitution effects, and the income effect. The spouses are able to choose up to some physical maximum level of work hours (T) to maximize family utility.

Case 2: Labor Supply with a Constraint on the Husband's Hours of Work

We now see how a constraint on the husband's ability to effectively supply labor to the marketplace can alter the wife's hours of work. For the time being, it is assumed that this constraint affects only the male spouse. The husband desires to supply more hours of work to the labor market than some exogenously determined constraint (Ashenfelter, 1980), expressed as $H_h > H_h^*$. The constraint is binding, and he is prevented

from working more than H_h^* hours in this period. The husband experiences unemployment equal to $H_h^* - H_h$, which is essentially disequilibrium in nature. Unemployment of this type is determined solely by the layoff and recall decisions of employers.[3]

When the male spouse experiences this constraint on his hours of work, the family maximizes a revised utility function:

$$(5) \qquad U = u(T - H_h^*, L_w, C),$$

where the husband is "forced" to consume $T - H_h^*$ hours of nonmarket time. Under such circumstances the labor supply function of the wife is altered:

$$(6) \qquad \tilde{H}_w = f_w(W_w, H_h^*, Y + W_h H_h^*),$$

where her hours of work now depend on her wage rate and the labor supply constraint facing her husband. His labor market earnings are simply treated as another component of nonlabor family income.

This is essentially the basis for the added worker effect, where the unemployment of the "primary" earner encourages the entry of "secondary" earners into the labor force. It is also the basis for the additional work effect of this study, where the unemployment of the male spouse encourages additional hours of market work by the female spouse.

Holding all else constant, the unemployment of the male spouse should increase the hours worked by the female spouse $(\tilde{H}_w > H_w)$. There are two reasons to expect this result. First, there is an income effect. Family income is lower than it would be without the hours constraint on the

husband. Increased market work by the wife may be preferable to
"dissaving, asset decumulation, or increased debt" by the family (Mincer,
1962, p. 75). Second, there is a potential substitution effect. The
husband is forced to consume more nonmarket time than desired. During
this period he may assume some of the home production activities of the
wife, lowering her opportunity cost of labor market activity. Thus, both
an income and substitution effect should encourage more hours of market
work from the wife with the unemployment of her husband.

Case 3: Labor Supply with a Constraint on the Wife's Hours of Work

The conditions of the previous example can simply be reversed where
the wife, rather than the husband, experiences the constraint on hours of
work. The analysis is symmetrical and need not be formally presented
here. The supply of market work by the wife is effectively constrained
$(H_w > H_w^*)$, and the husband may respond by increasing his hours of work
$(\tilde{H}_h > H_h)$.

This is essentially the basis for the discouraged worker effect among
secondary earners, where general labor market conditions reduce labor
force participation. It is also the basis for the diminished work effect
of this study, where an exogenous constraint limits the ability of the
wife to supply labor to the marketplace.

Case 4: Labor Supply with Constraints on Hours Worked by Both Spouses

The two previous cases make very clear the impact of constraints on
the labor-supply behavior of a working wife. If the hours constraint
affects only her husband, he experiences unemployment and she increases
her hours of work. If she faces the hours constraint, her hours of work

decrease directly. However, the analysis becomes more complicated when these constraints affect both spouses in the same period and are not directly observable.

For expository convenience, assume for the moment that the hours constraints affect the spouses sequentially and are observable. The husband realizes that he cannot work his desired hours, and the wife alters her labor supply in response, as shown in Case 2. However, now she too faces a constraint based on her revised labor supply $(\tilde{H}_W > H_W^*)$. Do we see an additional work effect in this situation, in the sense that actual hours of work are greater than those coming from the unconstrained joint labor supply decision? Obviously, it depends on the relative magnitude of the additional work effect and the hours constraint. If the constraint is binding at only the revised level of labor supply, then an additional work effect occurs $(\tilde{H}_W > H_W^* > H_W)$. If the constraint is binding at the original level of labor supply, then her hours of work decline in the same period in which her husband experiences unemployment. All we observe is the diminished work effect $(\tilde{H}_W > H_W > H_W^*)$.

Since these constraints may not affect the spouses in this prescribed sequence, and since data on desired but unsatisfied labor supply are generally unavailable, there is little chance of distinguishing original, revised, and constrained hours of work by the wife. The essential result, however, is that both working spouses may find their labor supply constrained in the same period. The key is to derive an empirically feasible method for disentangling the additional and diminished work effects by isolating, as well as possible, the separate constraints facing the spouses. Two methods are employed.

In the tradition of past studies, measured labor market conditions are included as proxies for marketwide constraints. Poor employment opportunities should generally limit the ability of the wife to work her desired hours. The unemployment actually experienced by the husband is assumed to reflect the constraints that he faces in supplying hours to the labor market. These variables can thus be used to distinguish the diminished and additional work effects.

The disadvantage of this approach is that unemployment rates may not accurately reflect the particular constraints facing the female spouse. In fact, the actual unemployment experienced by the male spouse may be a better proxy for these constraints. Couples may often work in the same industry or occupation, possess similar skills or education, or even work for the same employer. In other words, the labor market constraints facing the spouses may be positively correlated. The measured impact of the husband's unemployment on the wife's actual hours of work may be capturing part of the diminished, as well as the additional, work effect.

A second method for separating these effects is also used. Since it is assumed that the husband's unemployment reflects labor market constraints that he faces, it seems reasonable to assume that the wife's unemployment reflects similar constraints facing her. Thus, the "desired" labor supply of a working wife may be thought of as a summation of her actual hours of employment and unemployment in a given year (Boskin, 1973).

There are two obvious shortcomings associated with this second procedure. First, we do not observe "hours" of unemployment. Some assumption must be made about desired hours of work over the duration of unemployment. Second, the labor market constraints facing the wife may

not result solely in her unemployment. For example, she may be forced to accept part-time work or a shortened work week, or she may temporarily drop out of the labor force.[4] If unemployment captures only some of the constraints the wife faces in supplying labor to the marketplace, then the additional work effect will continue to be underestimated by this method. However, this second procedure should reduce the potential downward bias associated with the measurement of the additional-work effect under the first procedure.

The Labor-Supply Response of the Wife in a Life-Cycle Setting

The static models predict, holding all else constant, a concurrent increase in the labor supply of a married woman with the unemployment of her spouse. It is important to consider under what circumstances this result would hold in a more general, intertemporal decision-making framework. If unemployment spells were fully anticipated by the family, the concurrent response would be almost nonexistent. The family would accumulate savings in anticipation of future unemployment, drawing down these savings when unemployment is actually experienced. Unemployment in a given period would affect the labor-supply behavior of the wife in all periods.

It is unlikely that future unemployment spells can be fully anticipated. Some unemployment is certainly a "shock" to family income, and the labor supply of other family members in that period would be altered (Heckman and MaCurdy, 1980, 1982). Even without an income effect, the substitution effect may encourage more hours of work by the female spouse when the male spouse experiences unemployment. The wife may shift a

larger proportion of her lifetime labor supply to that period because of lower opportunity costs.

This study seeks to empirically measure the wife's response to her spouse's unemployment in the same period. However, at the same time she may also be responding to her husband's long-run "weak attachment" to employment or his unemployment experienced in the past and expected in the future. The higher the level of "permanent" unemployment, the greater the probability of experiencing some of it in any period. Cross-sectional analyses cannot distinguish between the two effects, since the transitory variable is positively correlated with the unobserved permanent variable. The model developed in the next section utilizes panel data to disentangle these transitory and permanent responses.

THE PSID SAMPLE AND AN EMPIRICAL MODEL

The nature of this study places a number of restrictions on the selection of married couples from the PSID. First, the family must consist of the same two spouses over the observed six-year period (1975-1980); family units formed or dissolved over this period are not included in this sample. Second, wives in the sample must have worked in each of the six calendar years. This is the arbitrary definition given to "two-earner" families in this study.[5]

Table 1 presents some descriptive statistics from the selected group of 503 married couples. It is interesting to note the different work and earnings patterns of the sexes. The average married woman in this sample worked 1,543 hours per year. This is equivalent to 38.6 weeks of full-time work (40 hours per week), or 29.7 hours per week of part-time work.

Table 1

Selected Mean Variables from the Sample of Working Wives

	1975	1976	1977	1978	1979	1980
Personal and Family Characteristics						
Age of wife	34.7	35.7	36.7	37.7	38.7	39.7
Age of husband	37.2	38.2	39.2	40.2	41.2	42.2
Education of wife	12.5	12.5	12.5	12.5	12.5	12.5
Children living in family unit	1.6	1.6	1.6	1.5	1.4	1.4
Percentage with preschool children	29.2%	28.6%	26.8%	27.6%	28.2%	27.6%
Percentage nonwhite	31.6%	31.6%	31.6%	31.6%	31.6%	31.6%
Income Information[a]						
Total family income	$28,520	$30,801	$32,594	$33,896	$34,207	$34,438
Nonlabor family income	2,095	2,308	2,686	3,001	3,179	3,288
Hourly wage of husband[b]	8.52	9.06	9.30	9.57	10.09	10.00
Hourly wage of wife[b]	6.02	6.34	6.74	6.37	6.54	6.56
Percentage of families receiving transfer payments	23.7%	24.1%	21.9%	18.7%	19.5%	27.6%
Employment Information: Wives						
Hours of work	1,439	1,487	1,521	1,613	1,620	1,578
Percentage experiencing unemployment	13.5%	11.7%	12.9%	10.3%	10.7%	11.7%
Weeks of unemployment[b]	16.2	15.4	11.4	11.0	11.2	14.4
Employment Information: Husbands						
Hours of work	2,114	2,154	2,169	2,189	2,139	2,073
Percentage experiencing unemployment	16.3%	14.5%	11.3%	9.5%	8.7%	13.9%
Weeks of unemployment[b]	12.5	10.2	11.4	9.2	9.5	11.1

-table continues-

	1975	1976	1977	1978	1979	1980
National Unemployment Rate	8.5%	7.7%	7.1%	6.1%	5.8%	7.1%
County Unemployment Rate	8.4%	7.1%	5.7%	5.5%	5.5%	6.9%
Number of Observations	503					

[a]All income and wage measures are inflated to 1980 dollars by the GNP deflator.

[b]Mean variables are conditional on state participation in that year.

These figures suggest that even among this group of working wives, there may be some potential for increased market work in response to the unemployment of their spouses. Notice also that the average married woman in this sample earned \$6.43 per hour, while the average married man earned \$9.42.[6] Wives received less than half the yearly earnings of their husbands. Thus, even among these two-earner families, there is quite a difference in both the hours of employment and returns to employment of the sexes.

A reduced-form model is used to estimate the determinants of hours worked in this sample of married women. The equations can be written:

$$(7) \qquad H_{it} = \underline{\beta}_1' \underline{X}_{it} + \beta_2 W_{it} + \alpha_i + e_{it}, \qquad i = 1,\ldots,N$$

$$(8) \qquad W_{it} = \underline{\gamma}' \underline{X}_{it} + \delta_i + v_{it}, \qquad t = 1,\ldots,T$$

where H_{it} and W_{it} are the natural logarithms of the hours of work and the wage rate of wife i in year t, respectively.

The hours equation is a log-linear function of a vector of unknown population parameters $(\underline{\beta}_1')$ multiplied by a vector of exogenous variables $(\underline{X}_{it})$. Some of these variables are specific to the individual or family (education of the wife, children in the family unit, unemployment of the husband, etc.). Other variables in this vector are common to everyone in the period (national unemployment rate, time trend, etc.). The hours equation also includes the log wage of the wife, which is endogenously determined in this system. The resulting β_2 coefficient can be interpreted as the own-wage elasticity. The disturbances in the two equations (e_{it}, v_{it}) are assumed to be independently and identically distributed across families and time.

It should be noted that wage rates in this study are constructed by dividing total labor market earnings by hours of work. Any misestimate in hours of employment will induce a negative bias in the estimated own-wage effect. More generally, there may exist some correlation between the wife's wage and the error term in the hours equation. To purge this correlation from the system and produce unbiased coefficient estimates in the hours equation, two-stage least-squares techniques are used.[7]

The "fixed effect" term in the hours equation (α_i) is allowed to vary across families but not across time. It is assumed to capture the unobservable, time-invariant factors that affect the hours worked by these married women. This fixed effect captures the permanent response of wives to the long-run unemployment of their spouses. This is how the transitory and permanent determinants of labor supply behavior are separated.[8]

EMPIRICAL RESULTS AND INTERPRETATION

A mean deletion procedure is used to estimate the cyclical and transitory determinants of hours worked. No attempt is made to calculate the permanent or family-specific effects. Three sets of regression results are presented in Table 2.

The estimated own-wage elasticity of the wife's wage (LNWGW) is positive, the cross-wage elasticity of the husband's wage (LNWGH) is negative, and both are significantly different from zero at conventional test levels in all regressions. A 10 percent transitory increase in the wage of the average married woman increases her hours worked in that year by 7.6 percent, while a 10 percent transitory increase in the wage of her

Table 2

Estimates of Cyclical and Transitory Determinants of
Hours Worked by the Sample of Working Wives
(Standard Errors in Parentheses)

Variables[a]	Excluding State and Local Unemployment Rates, Husband's UI, and Interaction of Husband's Weeks of Unemployment with Wife's Education (1)	Excluding State and Local Unemployment Rates and Interaction of Husband's Weeks of Unemployment with Wife's Education (2)	All Variables (3)[b]
LNWGW[c]	.758* (.418)	.757* (.418)	.776* (.425)
LNWGH	-.081* (.039)	-.081* (.039)	-.082* (.039)
KIDS	-.077** (.019)	-.077** (.019)	-.077** (.019)
PRESL	-.250** (.035)	-.250** (.035)	-.243** (.035)
UNRTW	-.111** (.021)	-.111** (.021)	-.121** (.025)
UNRTS	---	---	.049 (.080)
UNRTC	---	---	-.000 (.006)
UNWKS	-.008** (.002)	-.007** (.002)	-.038* (.022)
UI	---	-.003 (.006)	-.004 (.006)
UNWKS x EDUC	---	---	.002* (.001)

Note: Variable definitions are as follows: LNWGW = natural logarithm of wife's wage; LNWGH = natural logarithm of husband's wage; KIDS = number of

--table continues--

Notes to Table 2, continued

children in family; PRESL = dummy variable that equals 1 if child younger than 6; UNRTW = national unemployment rate for women aged $\geq$ 20; UNRTS, UNRTC = unemployment rate in state, county; UNWKS = weeks husband unemployed; UI = unemployment insurance receipts of husband; EDUC = wife's years of schooling.

[a]Other variables are included in these regressions but are not shown (non-labor and nontransfer family income, age squared, time, and time squared).

[b]In addition to the variables mentioned in footnote a, other variables were included in this regression but are not reported. National unemployment rate, county unemployment rate, race, and presence of a preschool child were also interacted with the unemployment of the husband.

[c]This is the predicted natural logarithm of the transitory wage of the wife. Instrumental variables include age, experience, the national unemployment rate, a time trend, and various squared and interacted variables.

*significant at 10% level, two-tailed test.
**significant at 1% level, two-tailed test.

husband decreases her hours worked by .8 percent. As expected, the number of children (KIDS) and the presence of a preschool child (PRESL) in the family reduce hours of market work among these married women.

The effect of the national unemployment rate for women 20 years old and over (UNRTW) is negative and significant, providing evidence of the diminished work effect—i.e., working wives tend to work fewer hours during general recessionary periods. For example, the average wife in this sample worked 391 more hours in 1979 (peak of the business cycle) than in 1975 (trough), holding all else constant. However, when state and county unemployment rates (UNRTS, UNRTC) are entered in column (3), they appear to have no impact on hours worked. The insignificance of county unemployment rates is particularly surprising. It was expected, a priori, that these local measures would capture many of the particular labor market conditions facing the household.

I offer two explanations for the findings on county unemployment rates. First, local demand conditions may have little impact on hours worked by this group of working wives. Since they work in each of the six years, they may be relatively unaffected by such factors. Any response to labor market conditions may be captured by national unemployment rates, which are positively correlated with these local measures.[9] Second, measured county unemployment rates may not accurately reflect existing local employment conditions, since local unemployment rates are often poorly measured (Czajka and Carr, 1981).

The key finding of this study concerns the impact of the husband's weeks of unemployment (UNWKS) on the wife's concurrent hours of work. The hypothesis is that this additional work effect will be positive, holding all else constant. However, in column 1 of Table 2 the estimated

coefficient on this variable is negative, and significantly different from zero at a 1 percent level using an appropriate two-tailed test.

It is possible that this positive impact of the unemployment of the husband may be confounded by the negative impact of any unemployment compensation received during this period. These transfer payments would certainly lessen the incentive for the wife to work additional hours in that year. To test this possibility, the equation is reestimated with the inclusion of unemployment insurance receipts of the husband (UI) as an additional independent variable. These results are reported in column (2). Although the expected negative coefficient is obtained on this new variable, it is insignificant. More important, the negative coefficient on UNWKS is still negative and significant, with only a slight decrease in its absolute value.

An explanation for this negative coefficient on the husband's unemployment, as suggested in the first section, is that measured unemployment rates do not accurately reflect all the demand conditions facing the family. The unemployment experienced by the male spouse may proxy for these unobserved labor market constraints. In this way, the estimation of the hypothesized additional work effect is biased. Unmeasured factors that increase the unemployment weeks of the husband are associated with the unmeasured factors that limit or discourage the employment hours of the wife. This negative correlation may be so strong that it obscures any positive additional work effect.[10]

This interpretation is purely conjecture at this point, since we have no direct evidence that the husband's unemployment is associated with unmeasured demand conditions that are "constraining" the wife's hours of work. However, indirect support for this interpretation is believed to

come from the last regression in Table 2, and the additional regressions reported in Table 3.

The wife's response to her spouse's unemployment may vary with her own circumstances and other relevant factors. To test this possibility, a number of variables were interacted with the husband's weeks of unemployment, and included in the regression reported in column 3. Only one of these interacted variables proved to be significant. This is the interaction of the husband's weeks of unemployment and the wife's years of schooling (UNWKS x EDUC).

Wives with higher eduational levels may be less affected by the same factors influencing the unemployment of their spouses. Their education enables them to gain access to a wider range of job opportunities. They are better able to maintain or increase their hours of work when faced with both their husband's unemployment and generally poor employment prospects in the area. The hypothesis is that unmeasured local demand conditions will be less likely to diminish the additional work effect among highly educated married women.

This result is indeed found. The coefficient on the interacted variable is positive and significant. Wives with more years of schooling are relatively less likely to reduce their hours of work during periods in which their spouses experience unemployment. The economic significance of this result should be noted. A married woman with the mean characteristics of the sample would experience a 153-hour reduction in her yearly hours of work with the unemployment of her spouse (a 9.9 percent reduction in total hours).[11] The same woman, with a college degree, would experience only a 26-hour reduction (a 1.7 percent reduction in total hours).

It was suggested earlier that both spouses may find their labor supply constrained in the same period. Since these constraints may be positively correlated between the spouses and unemployment rates would be unlikely to capture the full impact of any constraints facing the wife, a negative coefficient on the unemployment of the husband could result if one looked for the additional work effect solely through hours of work. The wife may want to increase her hours of work, but may be effectively prevented from doing so. If the constraints on the wife's labor supply result only in her unemployment, then we can obtain a measure of her "desired" labor supply by adding together her hours of employment and unemployment. By using this new measure of labor supply as the dependent variable, the positive additional work effect should appear.

The same equations reported in Table 2 are reestimated with this new dependent variable. The PSID provides data on the weeks of unemployment of working wives in each year. To combine this information with hours of work, some assumption about hours of unemployment per week is needed. It is assumed that each wife desires to work the same hours during weeks of unemployment that she worked during weeks of employment in that year. For example, a part-time worker is believed to desire part-time employment when unemployed. The problem is that part-time work may itself result from the constraints affecting labor supply, thus underestimating desired labor supply. However, the reported results are not substantially affected by this choice of hours per week of unemployment.[12]

The regression results are reported in Table 3. The coefficient on UNWKS continues to be negative in all regressions, but only significantly different from zero in column 1. The absolute size of the coefficients, however, is reduced relative to those reported in Table 2 by the

Table 3

Estimates of Cyclical and Transitory Determinants of
Hours of "Labor Supply" by the Sample of Working Wives
(Standard Errors in Parentheses)

Variables[a]	Excluding State and Local Unemployment Rates, Husband's UI, and Interaction of Husband's Weeks of Unemployment with Wife's Education (1)	Excluding State and Local Unemployment Rates and Interaction of Husband's Weeks of Unemployment with Wife's Education (2)	All Variables (3)[b]
LNWGW[c]	.649 (.411)	.647 (.411)	.714* (.417)
LNWGH	-.063* (.038)	-.063* (.038)	-.060 (.038)
KIDS	-.094** (.018)	-.094** (.018)	-.097** (.018)
PRESL	-.212** (.034)	-.212** (.034)	-.203** (.035)
UNRTW	-.090** (.021)	-.089** (.021)	-.114** (.024)
UNRTS	---	---	.098 (.078)
UNRTC	---	---	.004 (.006)
UNWKS	-.004* (.002)	-.002 (.002)	-.018 (.021)
UI	---	-.008 (.006)	-.007 (.006)
UNWKS x EDUC	---	---	.000 (.001)

Note: The dependent variable, "labor supply" of the wives, is measured by adding together hours of employment and hours of unemployment.

--table continues--

Notes to Table 3, continued

a Other variables are included in these regressions but are not shown (non-labor and nontransfer family income, age squared, time, and time squared).

b In addition to the variables mentioned in footnote a, other variables were included in this regression but are not reported. National unemployment rate, county unemployment rate, race, and presence of a preschool child were also interacted with the unemployment of the husband.

c This is the predicted natural logarithm of the transitory wage of the wife. Instrumental variables include age, experience, the national unemployment rate, a time trend, and various squared and interacted variables.

*significant at 10% level, two-tailed test.
**significant at 1% level, two-tailed test.

inclusion of hours of unemployment as part of the labor supply of the wife. This leads to two conclusions. First, the negative effect of the husband's unemployment is lessened by using this alternative measure of the wife's labor supply. This indicates that wives tend to experience unemployment in the same years as their husbands. Second, the additional work effect is still not found, even under this broader definition of labor supply. This suggests that spouses may be simultaneously constrained in effectively supplying labor to the marketplace, but that for many wives this results in their leaving the labor force for some period of time. Working wives experience more unemployment and more time out of the labor force during periods when their husbands are unemployed.

CONCLUSION

This study finds evidence of the diminished work effect among married women who have a fairly persistent attachment to employment--their average hours of work decline during years of general recession. On the other hand, this study finds no evidence of the additional work effect-- working wives work fewer hours, not more, in years in which their spouses experience unemployment. Nor is there evidence of an additional work effect when hours of employment and unemployment are added together to define the wives' labor supply. Unmeasured demand conditions therefore seem to influence the husband's unemployment and to limit or discourage the wife's labor supply.

A number of qualifications should be attached to interpretation of the results reported here. First, the findings concern only this group of "two-earner" families, where wives have fairly persistent attachment

to employment. No attempt has been made to analyze these same deter-
minants among a more representative group of all married women.[13]
Second, the absence of the additional work effect applies only to the
wife's response during the period of her husband's unemployment, whereas
she may react by increasing hours of work in subsequent periods. This
possibility of a lagged response has not been explored. Third, as noted
earlier, the explanation for these results—unmeasured demand conditions—
is almost purely conjecture. Other possible explanations may exist. For
example, the nonmarket time of the spouses may be complements rather than
substitutes—i.e., the "forced" leisure of the husband may raise the value
of the nonmarket time of the wife.

One question raised by these findings concerns how the _earnings_ of
married women may vary with the unemployment of their spouses. Wives may
increase their earnings by accepting jobs with higher wages, rather than
working additional hours. This possibility is explored in Appendix II.
The results confirm the general findings of this study: unemployment
of the husband is associated with a net reduction in the earnings of the
wife. Although there is some reason to expect that the emergence of two-
earner families in society may greatly dampen cyclical fluctuations in
overall family income, no evidence to support that expectation has been
found in this study.

APPENDIX I

Transitory fluctuations in overall family income are regressed on measures of family circumstances and labor market conditions. The results of three separate regressions are reported in Table A.1. The sample consists of 503 households observed over a six-year period, the same sample used elsewhere in this paper. The empirical results are obtained from a "fixed effect" model discussed in the second section of the paper. The reported coefficients are "within estimators" that capture the transitory determinants of family income (see footnote 8).

The presence of a preschool child in the family unit (PRESL) is associated with a reduction in family income. This result was expected, since the sample consists of two-earner families. Married women are likely to reduce their market work because of child care responsibilities, and this would result in a decline in overall family income.

As expected, weeks of unemployment (UNWKS) by married men reduces total family income in that period. This effect is statistically significant at a 1 percent level. However, it is the economic significance of this coefficient that is of primary importance. Holding all else constant, one week of unemployment is associated with a $361 reduction in family income (all figures in 1980 dollars). This is somewhat surprising, since the average married man in the sample earns only $388 per week. The reduction in family income amounts to roughly 93 percent of the husband's weekly earnings. An unexpectedly small proportion of this income loss appears to be offset by the receipt of unemployment insurance benefits or an increase in the earnings of other family members.

Table A.1

Estimates of Cyclical and Transitory Determinants of
Family Income in Two-earner Families
(Standard Errors in Parentheses)

Variables	Excluding State and Local Unemployment Rates and the Husband's Weeks of Unemployment (1)	Excluding State and Local Unemployment Rates (2)	All Variables (3)
KIDS	.006 (.006)	.002 (.006)	.002 (.006)
PRESL	-.029* (.013)	-.027* (.012)	-.026* (.012)
UNRT	-.084** (.004)	-.079** (.004)	-.076** (.006)
UNRTS	----	----	.010 (.027)
UNRTC	----	----	-.002 (.002)
UNWKS	----	-.011** (.001)	-.011** (.001)

Note: When a time trend is included in the regression, standard errors on the overall unemployment rate (UNRT) increase substantially. The high correlation between the unemployment rate and the time trend over this period (.86) makes it difficult to separate the cyclical and time trend effects. However, the coefficients on UNWKS remain negative and significant when a time trend is included. See text tables for definitions of other variables.

*significant at 10 percent level, 2-tailed test.
**significant at 1 percent level, 2-tailed test.

APPENDIX II

Transitory fluctuations in the yearly earnings of married women are regressed on measures of family circumstances and labor market conditions. The findings of three separate regressions are reported in Table A.2. The unemployment of the husband is associated with a decline in the earnings of the wife, holding all else constant. Earlier results in this study showed that a decline in the wife's hours worked accompanied the husband's unemployment. These results suggest that wives do not respond by increasing their earnings through higher wages, rather than through more hours of work.

It is interesting to compare the economic significance of these results to those found earlier. Using the coefficients generated from the regressions reported in Table 2, the average wife would experience a $984 decline in her yearly earnings when her husband was unemployed. However, this assumes a constant wage of $6.43. The findings in Table A.2 allow both hours of work and the wage to change. In this situation, the same unemployment would be associated with a $818 decline in the wife's yearly earnings. This lower figure offers some evidence that married women may respond to their spouses' unemployment by finding jobs with higher wages.

Table A.2

Estimates of Cyclical and Transitory Determinants
of the Earnings of Working Wives
(Standard Errors in Parentheses)

Variables	Excluding state and Local Unemployment Rates and the Husband's Weeks of Unemployment (1)	Excluding State and Local Unemployment Rates (2)	All Variables (3)
KIDS	-.033* (.017)	-.033* (.017)	-.034* (.017)
PRESL	-.295** (.034)	-.295** (.034)	-.298** (.034)
UNRTW	-.120** (.010)	-.119** (.010)	-.114** (.016)
UNRTS	---	---	-.046 (.075)
UNRTC	---	---	-.009 (.005)
UNWKS	-.008** (.002)	-.007** (.002)	-.006** (.002)
UI	---	-.007 (.006)	-.007 (.006)

Note: When a time trend is included in the regression, standard errors on
the overall unemployment rate (UNRTW) increase substantially. The
high correlation between the unemployment rate and the time trend
over this period (.85) makes it difficult to separate the cyclical
and time trend effects. However, the coefficients on UNWKS remain
negative and significant when a time trend is included. See text for
definition of other variables.

*significant at 10 percent level, 2-tailed test.
**significant at 1 percent level, 2-tailed test.

NOTES

[1]The figures in this paragraph are taken from Statistical Abstract of the United States, 1981, published by the Bureau of the Census. Only recent data is available on the earnings of wives as a percentage of family income.

[2]Note the terminology used in this study to identify the wife's reaction to poor labor market conditions (diminished work) and the unemployment of her spouse (additional work). This is done to differentiate these responses from those examined in the earlier "discouraged worker" and "added worker" literature, which concerned movements into and out of the labor force of all "secondary" workers. See Woytinsky (1940) and Humphrey (1940) for the origins of this debate.

Previous research examining the impact of discouraged and added worker effects among married women has been inconclusive. Using mostly aggregate data and labor force participation rates, earlier cross-section studies generally found a negative net effect (Bowen and Finegan, 1965; Cain, 1966), while time-series studies generally found a zero net effect (Hansen, 1961). Fleisher and Rhodes (1976) found that the apparent dominance of the discouraged worker effect in the cross-section studies was probably caused by simultaneous equation bias. Using mostly disaggregated data, more recent studies have been able to isolate a positive added worker effect (Toikka, 1976; Mitchell, 1980; Lundberg, 1981; and Heckman and MaCurdy, 1980, 1982). However, these studies concentrate primarily on either transition probabilities between employment states or labor force participation rates, and a number of qualifications could be attached to their findings. For example, by not controlling for a time

trend, Mitchell cannot separate the "historical" increase in participation from any "cyclical" fluctuation in this behavior. Layard, Barton and Zabalza (1980) find no evidence of the added worker effect through either participation or hours of work. My study suggests that, after controlling for unmeasured fixed effects and the specific unemployment of the husband, the diminished work effect dominates the additional work effect.

[3]Alternatively, the unemployment of the husband could be modelled in a job search framework as part of the utility-maximizing decision process of the family. Johnson (1983) develops an explicit model of this type, but concludes, after an empirical investigation of this behavior, that unemployment appears to be largely involuntary, as assumed in this study.

[4]Married women may be more likely than married men to respond to labor market constraints by dropping out of the labor force, because of the higher value of their nonmarket time in home production activities.

[5]A number of other exclusions were made to restrict the diversity of the sample, and to eliminate the various behavioral responses that might be expected from these different groups. Families were excluded from the sample if either spouse was younger than 24 in 1975 or older than 61 in 1980. Exclusions were also made if the husband was a farmer, strictly self-employed, permanently disabled, or a student, or if the wife was a student or disabled in any year.

[6]All wage and income figures used in this study are adjusted to 1980 dollars by the GNP deflator.

[7]Some exclusions of exogenous variables are assumed to exist across the two equations. The identifying variables in the wage equation are experience, experience squared, and various interacted terms.

[8]An estimation technique is used to pool the time-series and cross-section data, and allow for the presence of fixed effects (Mundlak, 1978). The data are transformed by deviating each variable and disturbance from the family-specific mean over the T periods. Because this procedure utilizes information on the variation of these measured variables within each family, it is often referred to as the "within estimator." This procedure eliminates other variables from the equations that do not vary over time for each family, but does allow variables that are hypothesized to affect transitory fluctuations in labor supply behavior to be estimated.

[9]The simple correlation between UNRTW and UNRTC is .484 in this sample.

[10]This result was found in a study by Layard, Barton, and Zabalza (1980). A cross-section of British households was used to empirically estimate the determinants of the labor-supply behavior of married women. The authors found that wives with unemployed husbands are not only less likely to be employed, but also tend to work fewer hours when they are employed. They attribute this result partly to the Supplementary Benefit System in England, and partly to the fact that both spouses live in the same area with the same employment opportunities. This second interpretation is essentially identical to the one put forth in this study. However, because the authors employ cross sectional analysis they cannot rule out the possibility that unmeasured personal characteristics of the households (e.g., skills, motivation or tastes for market work by the spouses) are responsible for this result. Thus the findings of this study, by considering the impact of fixed effects, provide additional support for Layard's interpretation.

[11]The predicted response is derived from the following equation:

$$\frac{\partial \ LNHRSW}{\partial \ UNWKS} = -.0384 + .0023 \ EDUC,$$

where only significant coefficients are included. The following mean

variables are used:

LNHRSW = 7.3415 (1,543 hours)

EDUC = 12.5 (16.0 for college degree)

UNWKS= 10.8

[12]Alternative specifications to those equations reported in Tables 2

and 3 were attempted with very little qualitative impact on the major

results of this study. For example, when unemployment hours were calcu-

lated as weeks unemployed times 40 hours per week there was little change

in the coefficients reported in Table 3.

[13]In a recent study, Heckman and MaCurdy (1980, 1982) found evidence

of this positive effect. Their sample included married women from

earlier years in the PSID who were required to have worked in only one of

the observed periods. My finding does not refute their result. It does

suggest, however, that this evidence of the "added worker" effect that

they have found may be underestimated by unmeasured demand conditions

causing the unemployment of the husband and limiting or discouraging the

labor supply of the wife.

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