

"EMPIRICAL TESTS OF LABOR-MARKET EQUILIBRIUM: AN EVALUATION" A COMMENT

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Although I disagree with Heckman and MaCurdy's characterization of equilibrium labor-market models as tautologous, I nonetheless believe that they have raised several important issues for the interpretation of tests against the equilibrium hypothesis. In my comments, I wish to add two points to their analysis. First, while the interpretation of self-reported unemployment as an explanatory variable in a conventional labor-supply equation is potentially ambiguous, it is possible to test some version of the equilibrium hypothesis by measuring the effect of demand-side variables on individual labor supply. Second, in shifting the question of the "correct" labor-supply elasticity from prime-age males to women and younger workers, Heckman and MaCurdy fail to acknowledge that even among prime age males there is significant cyclical variation in annual work hours. In my opinion, the available labor supply elasticity estimates cannot rationalize the year-to-year movements in hours observed for these workers.

UNEMPLOYMENT AS A CONSTRAINT

In analyzing the relation between labor supply and unemployment in microdata, I find it helpful to begin with a simple accounting identity that links the alternative uses of time. Since most of the microeconomic work on unemployment as a constraint uses the Panel Study of Income Dynamics (PSID), I will follow the PSID convention of dividing time in a calendar year into time allocated to sickness, vacation and time-

off, unemployment, and employment.¹

Let h_{it} represent the time spent employed by i in year t , and let u_{it} , l_{it} , and v_{it} represent the time spent by i in the activities of unemployment, vacation and time-off (leisure), and sickness. Then

$$h_{it} + u_{it} + l_{it} + v_{it} = T, \quad (1)$$

where T is a measure of total time available (e.g., 52 weeks, if time is measured in weeks).² From this accounting identity it follows that

$$h_{it} = T - u_{it} - l_{it} - v_{it}. \quad (2)$$

Ignoring sickness, cross-sectional or time-series variation in employment time is completely offset by variation in the sum of unemployment and leisure.

This fact, I think, is the basis for Heckman and MaCurdy's skepticism about the interpretation of the coefficient θ in their equation

$$h_{it} = h^*(w_{it}, x_{it}, \epsilon_{it}) - \theta u_{it}. \quad (3)$$

In the absence of an hypothesis about how survey respondents divide non-market time between unemployment and leisure, the interpretation of θ is ambiguous.

It is important to keep in mind that the equilibrium labor-supply model does not distinguish between unemployment and leisure. Lucas and Rapping (1969) suggested one possible interpretation of unemployment: reported unemployment is just some fraction of total nonmarket time (net of time lost to illness):

$$u_{it} = \alpha(T - h_{it} - v_{it}) = \alpha T - \alpha h_{it} - \alpha v_{it}. \quad (4)$$

¹In addition to the papers cited by Heckman and MaCurdy, papers by Ashenfelter and Ham (1979) and Ham (1982, 1986) deal with labor supply and unemployment in the framework of Heckman and MaCurdy's equation (3). These three papers make use of PSID microdata. Ham (1986) provides a readable summary of this work.

²The PSID questionnaire includes an interviewer check-point that asks the interviewer to explain any unaccounted weeks or months. See Institute for Social Research (1984, p. 18), for example.

According to this interpretation, observed unemployment time is simply the mirror image of employment time and provides no independent sample information on behavior.³ Evidence that $\theta \neq 0$ in equation (3) can therefore be interpreted as evidence of misspecification of the labor-supply function h^* .

The model behind the tests proposed by Ashenfelter and Ham (1979) and Ham (1982, 1986), on the other hand, assumes that reported unemployment includes information on hours constraints faced by workers. A simple model (ignoring hours lost due to sickness) is

$$h_{it} = h^*_{it} - c_{it} \quad (5a)$$

$$u_{it} = \alpha(T - h^*_{it}) + c_{it} \quad (5b)$$

$$l_{it} = (1 - \alpha)(T - h^*_{it}), \quad (5c)$$

where c_{it} is a measure of weeks or hours constraint facing individual i in period t . According to this interpretation, the finding of a nonzero θ in equation (3) can be interpreted as evidence of constraint, maintaining a correct specification for h^*_{it} .

Estimates of θ alone obviously cannot distinguish the equilibrium model of unemployment (4) from the disequilibrium model (5a)-(5c).⁴ In my opinion, however, the question of whether measured unemployment belongs on the right-hand side of a labor-supply equation misses the point of the disequilibrium hypothesis, which is that demand-side information is required to correctly specify observations on the supply side. On this question, a recent paper by Ham (1986) sheds interesting light. Consider an augmented labor-supply equation of the form

$$h_{it} = h^*_{it} + \gamma a_{it} \quad (6)$$

where a_{it} includes information on aggregate conditions in individual i 's

³Apart from variation in time lost to illness.

⁴One interesting possibility is to compare the coefficients of leisure and unemployment in an equation of the form

$$h_{it} = h^*_{it} - \theta_1 u_{it} - \theta_2 l_{it}.$$

industry and local labor market, in time period t . There is no connection between the measurement of h_{it} and the measurement of a_{it} . If the labor-supply model is correctly specified, however, then $\gamma = 0$, since market-level information is irrelevant to the individual supply decision controlling for wages (and individual characteristics). One may object to this test on two grounds. First, individuals may sort themselves into industries or local labor markets on the basis of tastes for leisure so that individual tastes may be correlated with market-level characteristics. This objection can be overcome by differencing:

$$\Delta h_{it} = \Delta h^*_{it} + \gamma \Delta a_{it},$$

provided that tastes do not change too quickly. Second, recent labor-market changes may signal new information on lifetime opportunities and hence induce labor-supply changes. This objection can be overcome by using lagged changes in local labor-market conditions to predict Δa_{it} :

$$\Delta h_{it} = \Delta h^*_{it} + \gamma' \Delta a_{it-1}, \quad (7)$$

where γ' represents the product of γ and the first-order correlation coefficient of Δa_{it} (which is assumed to be nonzero).

Although he does not report estimates of equation (7) directly, Ham's (1986) results using Δa_{it-1} as instrumental variables for Δu_{it} in a first-differenced version of equation (3) imply that γ is far different from zero.⁵ Of course, proponents of the equilibrium hypothesis may still argue that predictable location- and industry- specific transitory variations in tastes for leisure introduce a correlation between market-level demand indicators and individual labor supply. At this point, however, one may be tempted to ask whether the equilibrium hypothesis is a refutable proposition, or merely a rhetorical device. While I agree with Heckman and MaCurdy that the early literature on testing disequilibrium is inconclusive, I am disappointed that their analysis of the literature did not include the more recent evidence in Ham's (1986) work.

⁵In an earlier unpublished version of the paper, Ham (1984) reports exclusion tests for the presence of current and lagged first-differences of local- and industry-level labor-market indicators. These tests are highly significant for both the current and lagged market-level indicators.

2. ARE LABOR-SUPPLY ELASTICITIES TOO SMALL?

In answer to the claim that labor-supply elasticities are too small for a neoclassical labor-supply function to rationalize large aggregate fluctuations in employment, Heckman and MaCurdy observe that micro estimates of labor-supply elasticities usually ignore the elasticity of participation. They then cite evidence that much cyclical variation in manhours comes through the entry and exit of workers (particularly secondary workers) and that participation elasticities are relatively high. While not denying this evidence, I would like to point out that (i) annual hours of employment of male household heads are also cyclical, and (ii) a relatively small fraction of this cyclical variation is attributable to participation decisions. In order to document these claims I formed an extract of the PSID based on male household heads from households with no change in head over a 13-year period. Table 1 reports average hours per year and various measures of the change in hours for this group, together with the regression coefficients of these change measures on two measures of the aggregate cycle: the change in the unemployment rate and the change in real GNP. For comparison I also calculated changes in hours measures for continuously employed males. This evidence is useful because it is for this group of workers' annual labor-supply decisions that the best estimates of labor-supply parameters are available.

In my opinion it is still a significant problem to rationalize the year-to-year fluctuations in hours for these workers with the available labor-supply elasticity estimates. Evidence in MaCurdy (1981) and Altonji (1986) suggests that the intertemporal labor-supply elasticity for continuously employed males is in the neighborhood of .1 to .3. Thus a year-to-year change in wage rates of 6-20 percentage points is required to generate a change in hours of 2 percentage points.⁶ Such a change is outside the range of observed movements in real wages for the group in any year of the sample.

⁶Assuming that the marginal utility of wealth is constant for each member of the sample, the conventional intertemporal substitution elasticity is an upper bound on the elasticity of hours with respect to changes in wage rates that also generate revision in the marginal utility of wealth.

3. CONCLUSIONS

While much of the evidence against the equilibrium hypothesis surveyed by Heckman and MaCurdy can be explained by appealing to a richer class of equilibrium models, I think it would be unfair to leave the impression that the available equilibrium models have been unambiguously successful. The year-to-year variation in individual labor supply is large, and only a tiny fraction of this variation is explained by observable movements in wage rates.⁷ Much of the interest in alternative models of the labor market stems from the desire of economists to explain this variation by something more appealing than the tautological explanation of unobserved taste variation.

⁷The cross-sectional standard deviation of the change in the logarithm of annual hours for continuously employed males is approximately .35 in both the PSID and the National Longitudinal Survey of Older Men [Abowd and Card (1987, Table 3)]. Using the estimate in Duncan and Hill (1985, Table 3) that the signal-to-noise variance ratio in the survey measure of the change in annual hours is 1.22, the standard deviation of true hours changes for adult males is approximately .25. If, for example, the change in the logarithm of annual hours is normally distributed, a standard deviation of .25 implies that each year, one-half of adult males experience a change in their annual hours in excess of 15 percent. Altonji and Paxson (1986, Table 2) show that the estimated variability in cross-sectional changes in annual hours is reduced only slightly, if at all, by controlling for changes in wage rates, family income, marital status, and health status.

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