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T. ALDRICH FINEGAN AND ROBERT A. MARGO

Economic analysis of the labor supply of married women has long emphasized the impact of the unemployment of husbands—the added worker effect. This article re-examines the magnitude of the added worker effect in the waning years of the Great Depression. Previous studies of the labor supply of married women during this period failed to take account of various institutional features of New Deal work relief programs, which reduced the size of the added worker effect.

Few issues in labor economics have received as much attention as the factors influencing the labor force participation of married women. One such factor is the unemployment of husbands—the so-called added worker effect. Unemployment of the husband interrupts the flow of current income to a household. Without substantial assets to draw upon, or the ability to borrow against future income, the household's current consumption would decline—unless another family member not currently in the labor force, such as the wife, entered it and successfully obtained employment. Unemployment of the husband might also delay the planned exit from the labor force of a married woman already in it, again in order to maintain the household's current consumption.[1]

This article revisits the debate over the size of the added worker effect among married women in the late 1930s. We argue that previous studies of the labor supply of married women during this period have neglected the impact of New Deal work relief programs, which reduced the incentive for married women to seek employment when their husbands were out of work. Using data from the public use microdata sample of the 1940 census, we demonstrate that the association between work relief and labor force participation was so large that the added worker effect was almost entirely obscured in the aggregate. Our results have implications for understanding the economic effects of the New Deal,

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[1] The literature on the added worker effect and, more generally, on the labor supply of married women is very large. For detailed discussion of the added worker effect, see Lundberg, "Added Worker"; on the historical and contemporary determinants of the labor supply of married women, see Goldin, *Understanding*.

the design of programs to assist the unemployed, and the sources of the increase in married women's labor supply during World War II.

THE ADDED WORKER EFFECT IN THE LATE 1930s: THE ROLE OF NEW DEAL WORK RELIEF PROGRAMS

In the late 1930s and early 1940s, an intense debate arose over the size of the added worker effect and its macroeconomic implications. According to W. S. Woytinsky, the severity of the Great Depression created a large number of added workers, particularly among married women. Woytinsky also believed, however, that added workers would leave the labor force as recovery progressed so that "the number of jobs necessary to reduce unemployment . . . [was] less than the reported volume of unemployment would suggest."[2] Woytinsky was criticized by Clarence Long, who devoted a full chapter of his book, *The Labor Force Under Changing Income and Employment*, towards refuting the notion that the "unemployment of the main breadwinner would make it necessary for other family members to follow the 'help wanted' notices."[3] In Long's view, the number of added workers was trivial, absolutely and relative to the number of "discouraged" workers—persons who had stopped searching for employment when conditions were bad, but who would re-enter the labor market once aggregate demand improved.[4]

Subsequent research on the cross-sectional determinants of the labor supply of married women in the late 1930s has largely supported Long's position. In particular, using published census data for cities in 1940, William G. Bowen and T. Aldrich Finegan discovered a large, statistically significant, negative association between city-level unemployment and the labor force participation of married women, consistent with Long's argument.[5]

A problem with these earlier studies is their failure to consider the possibility that New Deal work relief policies reduced the size of the added worker effect among married women. As we document extensively in the next section, wives of men with "Public Emergency Work" (PEW) jobs were far less likely to be in the labor force during the census week in 1940 than other wives. That an association between married women's labor force participation and the PEW status of husbands might have existed is suggested by various institutional features of work

[2] Woytinsky, *Three Aspects*, p. 106.

[3] Long, *Labor Force*, chap. 10. The quote is from p. 181.

[4] See Long, *Labor Force*, chap. 10.

[5] Bowen and Finegan, *Economics*, pp. 836–37. Similar findings were reported by Cain, "Married Women," p. 58. Neither Bowen and Finegan nor Cain were able to investigate the absolute size of the added worker effect in 1940. To do so requires information on the employment status of husbands classified by the labor force participation of their wives. The published census volumes did not report this information for cities.

relief, particularly eligibility requirements. In general, to become eligible for PEW with the Works Progress Administration (WPA) or related government agencies, persons had to be both unemployed and to satisfy certain criteria, including a means test on family income administered by local relief authorities.[6] If family income exceeded the limit, the person could not be "certified" for work relief, and certification was a necessary condition for PEW employment.

Even if the means test were satisfied, households may have faced a "relative need" standard. Among unemployed persons that satisfied the means test, those in households with relatively lower incomes were, other things equal, assigned a higher priority for any PEW jobs that were available. In the early days of work relief, eligibility needed to be established only once. But requirements were tightened over time such that, by the late 1930s, persons on work relief were subject, in principle, to periodic or continuous reviews of eligibility.

Although the precise rules varied across communities, it appears that the earnings of other family members (in whole or part) were typically included in the determination of family income for eligibility purposes. Other things equal, a working wife would raise the level of household income if her husband was unemployed, thereby lowering the probability that such women would be observed among those married to men with PEW jobs.

By itself, the means test does not imply that the negative association between work relief and labor force participation was *causal*. For the association to have been truly causal, work relief must have been "preferred" by the household in the following sense. The value to the household of the wife remaining out of the labor force while her husband held a PEW job had to exceed (1) the value of labor force participation by the wife while her husband held a PEW job (assuming this did not make the household ineligible), and (2) the value of labor force participation by the wife while her unemployed husband searched for a non-PEW job instead of work relief. In addition, the wife had to be a true added worker: participation was preferred to nonparticipation while her husband was unemployed but not on work relief.

If instead, the negative association were merely a correlation between the PEW status of husbands and very low tastes (or opportunities) for market work on the part of their wives, a low participation rate would have continued among women whose husbands were unemployed but who had been on work relief in the recent past. According to this

[6] Our discussion of eligibility requirements for work relief is based on Howard, *The WPA*, chaps. 15–17. Strictly speaking, a means test is not necessary to produce a negative association between PEW status and married women's labor supply. If instead, PEW jobs had been allocated among the unemployed by a lottery, we would expect a lower rate of labor force participation among wives of men with PEW jobs than among wives of unemployed men, other factors held constant, as long as PEW employment was "preferred" in the sense discussed in the text.

scenario, the negative association is a selectivity effect: PEW eligibility requirements selected out households in which the wife was very unlikely to participate in the labor force, regardless of her husband's employment status. The household was presumably "better off" while the husband was on work relief, but the loss of the husband's PEW status was not sufficient to cause the wife to enter the labor market. But if the inequality conditions we have described generally held, we would expect a substantial jump in labor force participation among such women once their husbands were no longer on work relief—and this is what we observe.

Evidence on relative wages and employment conditions suggest why PEW employment might have been "preferred" as we have described. Although PEW jobs were low wage compared with the average job in the economy, they were not necessarily low wage compared with the average non-PEW job that some unemployed persons eligible for work relief might (eventually) get. In 1939, for example, we estimate that between 25 and 30 percent of all wage earners received average hourly earnings *less* than the average hourly earnings of unskilled employees on WPA projects.[7] More importantly, average wages on PEW projects appear to have exceeded the average wages that wives of men eligible for work relief could command in the labor market.[8] In addition, PEW jobs were relatively stable compared with private sector alternatives available to many of the unemployed.[9] Thus, employment on work relief for the husband with his wife out of the labor force could have generated a higher level of utility than the household had previously experienced.[10]

We acknowledge three caveats to our "on-off" method of measuring the causal impact of work relief on labor force participation. First, women whose husbands were on work relief might have lied about their

[7] The calculation is somewhat involved and is described only briefly here. Using figures on WPA pay scales from U.S. Federal Works Agency, *Final Report*, p. 25 and information on the rural-urban distribution of the population by region, we computed an estimate of the average monthly wage of unskilled employees on WPA projects in 1939, $42.00. Average monthly hours on WPA projects in 1939 were 130 (U.S. Federal Works Agency, *Final Report*, p. 25), so average hourly earnings were 32 cents per hour. Average hourly earnings of 32 cents per hour fell between the 25 and 30th percentiles of the distribution of average hourly earnings of all wage and salary workers in 1939 (excluding persons on work relief in 1940). The distribution of hourly earnings is from Burkhauser, et al., "Changes."

[8] Among wives of men on work relief in 1940 who worked in 1939, average weekly wages were $10.83. Multiplying by 4.3 weeks per month gives an estimated monthly wage of $46.57, which is biased upwards because the average number of weeks worked per month was less than 4.3. Because the average wage is computed only for women who worked, the average wages of all women, including the expected wages of women who did not work, would be lower (because labor supply among married women was a positive function of wages; see Goldin, *Understanding*). The average monthly wage of all employees on WPA projects in 1939 (unskilled, semiskilled, skilled, and professional) was $54.35 (computed from data in U.S. Federal Works Agency, *Final Report*, p. 26).

[9] Margo, "Microeconomics."

[10] This was a possibility that even the WPA acknowledged. See U.S. Federal Works Agency, *Final Report*, p. 28.

own employment to the census. Such behavior is observed today among women on welfare, and we cannot rule it out on the basis of the evidence at our disposal.[11] If concealment were the norm, however, the added worker effect was clearly understated by the 1940 census, because employment of married women was underreported. Second, having become accustomed to the regular receipt of income while their husbands were on work relief (compared with when their husbands were unemployed), nonworking women may have been more likely to enter the labor force once their husbands left work relief—in effect, their tastes for market work were increased.[12] Third, our empirical analysis is based on cross-sectional data contrasting women whose husbands were on work relief with women whose husbands had been on it in the recent past. Ideally, we would like a long panel data set of work histories of married couples (we would then be observing the same people before, during, and after work relief), but, to the best of our knowledge, such data are not available for the period.

EMPIRICAL ANALYSIS: THE 1940 CENSUS SAMPLE

Our empirical analysis is based on the public use microdata sample (PUMS) of the 1940 census.[13] The PUMS is a large (1/100) random sample of the population containing extensive information on household and personal characteristics. Unlike earlier censuses, which measured labor force participation using the "gainful worker" concept (the reporting of a gainful occupation), information on labor force status in 1940 pertained to labor force activity during the census week (March 24–30, 1940). For each person 14 years old or older, one of nine labor force statuses was recorded, including whether the person was employed in a PEW job. For persons deemed unemployed during the census week (including persons on work relief), the number of weeks of unemployment since the last private or non-PEW government job of one month or more was also reported.

We restrict our attention in this article to nonfarm married women

[11] Jencks, *Rethinking*, pp. 204–35. If concealment were the norm, however, the amount of fraud was massive, simply because the scope of the PEW program was very large. In the sample analyzed in this article, for example, roughly equal numbers of married men were unemployed or on work relief in 1940 (see Table 1, panel A). "Double-dipping"—employment of wives of men on work relief to the extent that eligibility was violated—is another type of fraud that may have occurred (see note 25).

[12] We consider this possibility to be remote because the regular receipt of income would have been unusual only compared with the previous spell of unemployment, not previous spells of employment. There is also an offsetting downward bias worth noting. If wives of unemployed men who had been on work relief in the recent past stayed out of the labor force in anticipation that their husbands would get back on work relief in the near future, our estimate of the causal impact of work relief would be understated. See Margo, "Interwar Unemployment," for a discussion of WPA regulations that enhanced the likelihood of re-entry on work relief among recent departures.

[13] U.S. Bureau of the Census, *Census of Population, 1940: Public Use Microdata Sample.*

between the ages of 14 and 54 who were not disabled and whose husbands were (1) present at the time of the census and (2) employed as a wage or salary worker (the self-employed and unpaid family laborers are excluded), unemployed, or not in the labor force. Married couples who had migrated across county boundaries between 1935 and 1940 are excluded.[14] We also created a subsample of women from our larger sample by identifying households who lived in 71 of the urban areas included in Bowen and Finegan's study. We use this subsample in multivariate analyses of labor force participation that control for various individual and household characteristics and for local labor market variables (for example, the area unemployment rate) in the spirit of Bowen and Finegan's analysis.

Our investigation of the added worker effect proceeds in two steps. First, we examine cross-sectional differences in labor force status among married women by husbands' employment status. Second, we examine transitions in labor force status, using the (limited) information available in the PUMS. Specifically, we construct a dummy variable, WW39, indicating whether or not a woman worked at least one week in 1939. Labor force "entry" is defined as the move from zero weeks worked in 1939 (WW39 equals zero) to being in the labor force in the census week. Labor force "exit" is defined as the move from positive weeks worked in 1939 (WW39 equals one) to being out of the labor force in the census week.[15]

We classify husbands into four broad labor force categories, according to their employment status during the census week: (1) employed at a private sector or non-PEW government job, (2) employed at a work relief job, (3) unemployed, (4) out of the labor force. Within the unemployed category we distinguish individuals by whether they held a work relief job in 1939. We are able to identify the latter because of a peculiarity of the 1940 census. Information on wage and salary income and weeks worked in 1939 was collected for persons aged 14 and over. But because income in 1939 included income from work-relief jobs, weeks worked in 1939 and weeks of unemployment (as measured by the

[14] By construction in the 1940 PUMS, a woman classified as "disabled" was not in the labor force; that is, there is no way to measure the effect of a disability on labor force participation. We therefore excluded disabled women from the sample because their husbands' employment status could not, by definition, affect their labor force participation. We excluded women over the age of 54 because their husbands were at risk of retirement (or may have retired already), and the decision faced by a married women to participate in the labor force when the husband retires was likely to have been very different from the decision to participate when the husband was unemployed at a younger age. We excluded self-employed husbands and farm households, for whom the meaning of the census question on unemployment is not clear and for whom the majority of income was not reported. The restriction to nonmigrants is explained in note 32.

[15] We experimented with different cut-off points (for example, two weeks and ten weeks), but our substantive findings were not affected. The reason is that most married women who worked at all in 1939 tended to work a substantial number of weeks (in the full sample, average weeks worked was 39 weeks and the median was 49 weeks among women who worked at least one week in 1939).

census) can overlap. For example, individuals could (and did) report 65 weeks or more of unemployment (that is, all of 1939 and the portion of 1940 up to and including the census week) *and* 52 weeks worked in 1939. Given the census conventions, we can be virtually certain that such persons held a work-relief job in 1939.[16]

Various limitations of the 1940 PUMS should be noted. There was concern at the time of the census that the data on unemployment durations were frequently approximate, that weeks worked were not always reported correctly, and that employment on work relief was understated.[17] The "transition" probabilities referred to above will not capture all relevant transitions, because we have no information on labor force status in 1940 before or after the census week.[18]

Table 1 presents labor force participation rates during the census week and, for women who were in the labor force, the proportions employed (in private sector or non-PEW jobs, or on work relief) and unemployed. Table 2 presents our estimates of transition rates along with the proportion of married women working at least one week in 1939 (WW39 equals one). The "Full Sample" (panel A in both tables) refers to all women meeting the sampling criteria in our extract from the 1940 PUMS. The "Bowen-Finegan Subsample" (panel B in both tables) refers to observations in the urban subsample mentioned above. Because the substantive findings for the Bowen-Finegan subsample are essentially the same as for the full sample, we focus on the full sample results.

[16] We take a conservative approach in measuring work-relief experience in 1939. By definition the maximum number of weeks a person in the labor force could actually work or be unemployed during the period January 1, 1939 to March 30, 1949 is 65. As noted in the text, duration of unemployment is measured from the last private or nonemergency government job that lasted longer than one month (which we assume is equal to four weeks). We make the conservative assumption that if the sum of weeks unemployed and weeks worked exceeds 73, the individual held a work-relief job at some date in 1939. It is likely that this assumption biases downward the fraction on work relief in 1939, for three reasons. First, weeks worked in the 1940 census are "full-time equivalent" weeks; that is, if a person worked 52 weeks at a half-time job (for example, 20 hours per week), weeks worked is reported as 26, not 52. The majority of work-relief jobs were part-time jobs in this sense. Thus, some persons reporting weeks worked and weeks unemployed equal to, say, 70, might have held a work-relief job (half-time) for 14 weeks or more in 1939, but they will be missed by our algorithm. Second, the greater the sum of weeks worked and weeks unemployed (in excess of 73), the lower the probability that no job held in 1939 exceeded one month in duration. It is implausible, for example, that an individual reporting 65 weeks of unemployment and, say, 48 weeks worked held 12 different private or nonemergency jobs, each less than a month's duration, in 1939. However, it is plausible that a person reporting 65 weeks unemployed and 5 weeks worked might have held two nonrelief jobs of short duration. The selection of 73 weeks is a compromise, but the cutoff could be set at 69 (the minimum implied by the census) or slightly higher (for example, 79) with no change in the substantive results. Third, we are ignoring nonparticipation; a person could have held a work-relief job in 1939 but have been out of the labor force for some period, such that the sum of weeks unemployed and weeks worked is less than 73.

[17] Jenkins, "Procedural History," pp. 96, 101.

[18] In particular, we will miss transitions among women who did not work in 1939 but who entered and left the labor force between January 1, 1940, and March 23, 1940, or who entered the labor force after March 30, 1940.

TABLE 1
LABOR FORCE PARTICIPATION OF MARRIED WOMEN IN 1940, BY HUSBANDS' EMPLOYMENT STATUS

	Wives				
			Status of Labor Force Participants (%)		
Husbands	*N*	LFPR	Employed	On PEW	Unemployed
		A. Full Sample			
Employed in 1940	100,499	16.1	96.7	0.5	2.8
On PEW in 1940	7,714	6.6	80.5	3.1	16.4
Unemployed in 1940	8,172	22.8	85.9	3.6	10.5
On PEW in 1939	1,112	16.8	89.3	3.7	7.0
Not on PEW in 1939	7,060	23.8	85.5	3.6	10.9
Out of labor force	5,439	24.5	76.1	16.8	7.1
Total	121,824	16.3	93.8	2.0	4.2
		B. Bowen-Finegan Subsample			
Employed in 1940	39,113	17.0	96.4	0.4	3.2
On PEW in 1940	2,127	7.5	74.1	2.5	23.4
Unemployed in 1940	3,377	25.3	87.6	2.5	9.9
On PEW in 1939	415	19.8	89.0	2.4	8.6
Not on PEW in 1939	2,962	26.1	87.4	2.5	10.1
Out of labor force	1,959	24.4	79.5	11.3	9.2
Total	46,576	17.5	94.0	1.3	4.7

Notes: *N* is the sample size. LFPR is the labor force participation rate, that is, the proportion of women in the sample who were employed, on public emergency work relief (PEW), or unemployed during the census week (March 24–30, 1940). "Employed" means employed in a private sector or non-PEW job. "On PEW in 1939" identifies husbands who were unemployed in the census week and who held a PEW job at some time in 1939 (see note 16).
Source: See the text and the Appendix.

Among women whose husbands were unemployed in 1940 but who had not been on work relief in 1939, 23.8 percent were in the labor force, compared with 16.1 percent among women whose husbands were employed in a private sector or non-PEW job during the census week, or an added worker effect of 7.7 percentage points. Not all of these added workers succeeded in finding employment; approximately 27 percent of the 7.7 percentage point difference in participation rates is accounted for by the higher unemployment rate among wives of unemployed men than wives of employed men.[19] Women whose husbands were out of the labor force—in effect, the long-term jobless—also had higher participation rates than the wives of husbands with regular jobs.[20]

[19] Among wives of employed men who were in the labor force, 97.2 percent were themselves employed in a private sector or government job (non-PEW or PEW), compared with 89.1 percent of wives of unemployed men who had not been on work relief in 1939. The difference in employment rates between the two groups is 5.6 percentage points ($0.891 \times 23.8 - 0.972 \times 16.1$). Thus 27 percent ($= 1 - 5.6/7.7$) of the difference in participation rates is a result of the difference in unemployment rates between the two groups.

[20] The relatively high fraction of women whose husbands were out of the labor force who themselves held PEW jobs (16.8 percent, see Table 1, panel A) is consistent with relief policies. In

TABLE 2
RATES OF ENTRY TO AND EXIT FROM THE LABOR FORCE AND PERCENTAGE WHO WORKED IN 1939: MARRIED WOMEN, BY HUSBANDS' EMPLOYMENT STATUS, 1940

	Wife		
Husbands	Entry	Exit	Worked At Least One Week in 1939
	A. Full Sample		
Employed in 1940	0.9	17.8	18.6
On PEW in 1940	1.2	42.6	9.7
Unemployed in 1940	2.7	14.2	24.2
Not on PEW in 1939	2.8	13.6	25.0
On PEW in 1939	1.7	19.2	19.2
Out of labor force	2.4	11.7	25.6
Total	1.1	17.9	18.7
	B. Bowen-Finegan Subsample		
Employed in 1940	1.0	13.0	18.6
On PEW in 1940	1.8	24.0	7.9
Unemployed in 1940	3.0	7.9	25.0
Not on PEW in 1939	3.1	7.5	25.7
On PEW in 1939	2.4	11.9	20.2
Out of labor force	2.3	7.1	24.4
Total	1.2	12.4	18.8

Notes: The entry rate is the percent of all women who did not work at least one week in 1939 and who were in the labor force in 1940 during the census week. The exit rate is the percent of all women who worked at least one week in 1939 and who were not in the labor force in 1940 during the census week.
Source: See the text and the Appendix.

By contrast, the participation rate of wives of men who held PEW jobs in 1940 was only 6.6 percent, far lower than the participation rate of wives of unemployed or employed men. In addition, if the wife of a man on work relief was in the labor force, she was more likely to be unemployed than wives of employed or unemployed men. Thus, the contrasts between wives of men on work relief and other wives were even larger for employment rates than labor force participation rates.

In the published volumes of the 1940 census, a clear-cut distinction was not always made between the unemployed and persons on work relief; the latter were included with the unemployed in certain tabulations.[21] If this broader definition of unemployment is adopted, the participation rate of wives of unemployed men (now including men on work relief) falls to 14.9 percent in the full sample (18.4 percent in the Bowen-Finegan subsample). Thus, following the census convention *and*

general, it is unlikely that a married woman would be on work relief unless she was the "logical wage earner of the family, the economic head of the family, or the only worker available," such as when her husband was out of the labor force (Howard, *WPA*, p. 282).

[21] For a critique of the census convention, see Darby, "Three-and-a-Half Million U.S. Employees."

neglecting to disaggregate the unemployed group by PEW status causes the cross-sectional added worker effect to disappear (or become very small, in the Bowen-Finegan subsample).

In his critique of Woytinsky, Long fell into this very trap. Relying on a special report of the 1940 census, he constructed a table showing the aggregate labor force participation rates of married women (ages 18 to 64) classified by their husbands' employment status.[22] The table revealed that the participation rate of wives with unemployed husbands was virtually identical to that of wives whose husbands were employed (13.6 versus 13.7 percent). The special report that Long used, however, included men on work relief with the unemployed and was not disaggregated by work-relief status.[23]

Among women whose unemployed husbands had been on work relief at some time in 1939, 16.8 percent were in the labor force in 1940, 10.2 percentage points higher than the participation rate of wives whose husbands were still on work relief. This difference in participation rates, as discussed in the previous section, supports our contention that the negative association between work relief and labor force participation was causal.

The transition rates in Table 2 provide further insights into the added worker effect and the impact of work relief. Before discussing these rates, it is important to note that transitions were infrequent events. Although this is partly due to the brevity of the time interval over which the transitions are measured, it is also a consequence of the fact that, prior to World War II, labor force participation among married women tended to be dichotomous—that is, among married women in the labor force at a given point in time, most had been working continuously for several years. The infrequency of transitions observed in the 1940 PUMS is consistent with other evidence showing a high degree of long-term attachment to the labor force among married women currently in it.[24]

[22] Long, *Labor Force*, p. 193.

[23] Long constructed his table from information reported in U. S. Bureau of the Census, *Sixteenth Census of the United States: 1940, The Labor Force*, pp. 164–75. However, page 6 of this report states that "[i]n the tables on employment status of husbands" those "seeking work" (the unemployed) "were included with the group 'On Public Emergency Work'." We are not suggesting that Long's mistake was deliberate. As far as we know, he was unaware that wives of men on work relief had very low labor force participation.

[24] See Goldin, "Life-Cycle Labor Force Participation." The infrequency of entry may also reflect the operation of "marriage bars." Marriage bars, whose incidence apparently increased in the 1930s, refer to personnel policies adopted by firms that prohibited the hiring of married women (the "hire" bar) or the retention of women who married while employed (the "retain" bar). Marriage bars were concentrated in service-sector industries employing women in clerical or office work (for example, insurance, banking) and in the public sector (for example, public school teachers). Marriage bars, however, do not appear to have been adopted in factory work, and they were much less common in small firms. Thus, while the existence of marriage bars limited married women's employment opportunities, they did not make labor force participation impossible. See Goldin, *Understanding*, chap. 6, for a discussion of marriage bars.

The theory of the added worker effect implies that nonworking women would have been more likely to enter the labor force, and working women less likely to leave it, if their husbands were unemployed. Precisely this pattern is observed, comparing wives of unemployed men with wives of men employed in private or non-PEW government jobs. Unemployment of the husband tripled the entry rate (from 0.9 to 2.7 percent), whereas the reduction in the exit rate was more modest (20.2 percent; from 17.8 to 14.2 percent).

Consistent with our hypothesis that work relief reduced the added worker effect, wives of unemployed men who had been on work relief in 1939 had a higher entry rate (1.7 percent) than wives of men on work relief in 1940 (1.2 percent). Table 2 also reveals that, among wives of men on work relief in 1940, few had worked in 1939, and those who had were very likely to have left the labor force by the census date.[25] Both patterns are consistent with the operation of the means test. Many of the men on work relief in 1940 had also been on work relief in 1939, so the same labor supply disincentives applied.[26] If employment of the wife diminished the odds of eligibility for PEW, we would expect to see a disproportionate number of labor market exits among wives of men on work relief.

Our finding that work relief reduced the size of the added worker effect implies that more married women would have been in the labor force in the absence of the PEW program. An estimate of how many more can be derived from our estimate of the causal impact of work relief, that is, by assuming that wives of men on work relief in 1940 would have participated as frequently (in 1940) as wives of unemployed men who had been on work relief in 1939. Under the assumption, the participation rate of married women in the full sample would have been 16.9 percent instead of 16.3 percent. In terms of the population of

[25] The relatively high rate of market work in 1939 (19.2 percent) among wives of unemployed men who had been on work relief in 1939 is curious and may reflect some double-dippers who were caught. Because of the nature of the 1940 census, we cannot determine how many of the 19.2 percent of women who worked in 1939 did so only *after* their husbands left work relief. Using our algorithm to infer relief status in 1939, however, we can identify unemployed men in 1940 who worked full-time on PEW jobs throughout 1939—that is, very recent departures from long-term PEW employment into unemployment—and compare the participation of their wives with wives of men on work relief in 1940 *and* all of 1939 (long-term PEW employees). Approximately 14.8 percent of the wives of the very recent departures worked in 1939 (they could have done so only while their husbands were on work relief), compared with 10.4 percent of wives of long-term PEW employees. Some of the 14.8 percent may have been double-dippers, although it is also possible that they were working legitimately, in anticipation of the departures of their husbands from work relief. The names of the husbands (not reported in the 1940 PUMS) and access to PEW administrative records would be necessary to clarify this issue.

[26] Using our algorithm to distinguish 1939 relief status, we estimate that 63 percent of men on work relief in 1940 had also been on work relief at some time in 1939. About 9.6 percent of the wives of these men worked in 1939, compared with 9.8 percent among wives of men on work relief in 1940 who had not been on work relief in 1939.

married women, this translates into approximately 153,000 "missing" added workers, or 1.2 percent of the female labor force in 1940.[27]

MULTIVARIATE ANALYSIS

Tables 1 and 2 suggest that an added worker effect operated in 1940, but that its presence was masked by work-relief policies. The observed patterns, however, could reflect other factors correlated with the husband's employment status that also influenced labor force participation by his wife.

Accordingly, we estimated logistic regressions. Because Bowen and Finegan's research suggests that local labor market characteristics influenced the decision to participate, we used the Bowen-Finegan subsample, which was constructed with this purpose in mind. Along with the husbands' employment status categories, we controlled for various characteristics of the woman (for example, age, schooling, race) and the household, the predicted weekly wage of the husband, region, and four local labor market variables.[28] The local labor market variables are the same as those used in Bowen and Finegan's study: the local unemployment rate; percent female in the population; median annual full-time female earnings; and an industry mix variable, which measures the extent to which SMA employment was concentrated in industries that employed relatively large numbers of women.

Sample means for the regressions and the logistic coefficients are reported in Appendix Table 1. In Table 3 we use the logistic coefficients to compute differences in participation and transition rates between wives of men employed in a private sector or non-PEW job and wives of other men, analogous to those implied by Tables 1 and 2 (which are shown in the rows labelled Univariate in Table 3 for ease of comparison).[29] The principal finding is that the substantive differences in

[27] We assume that the percentage increase in participation observed in the full sample in the absence of work relief would apply to the nation as a whole. Thus, the participation rate of married women would have increased by 3.7 percent (= 16.9/16.3). According to the 1940 census, the participation rate of married women was 13.8 percent (Goldin, *Understanding*, p. 17); there were 30,090,488 married women, and 13,007,000 women of all marital statuses in the labor force (U. S. Bureau of the Census, *Historical Statistics*, pp. 20, 133). Multiplying the number of married women times the increase in participation (0.51 percentage points = 13.8 × 0.037) gives 153,461 additional labor force participants, equal to 1.2 percent (153,461/13,007,000) of the female labor force in 1940.

[28] Predicted weekly earnings, which were computed from an auxiliary regression, are intended to capture the effect of the husband's "permanent" income on wives' participation. The sample for the auxiliary regression consists of husbands in the Bowen-Finegan subsample who were not on work relief in 1940 and who worked 48 to 52 weeks in 1939. The independent variables were experience, experience squared, race, years of schooling, and regional dummies.

[29] To compute the differences implied by the logistic regressions, we first calculated the values of dp/dx for the husband's employment status variables at the sample mean probability, using the formula for the logistic model, $dp/dX = \beta p(1 - p)$. Since the left-out employment status category in the logistic regressions is "husband employed in a private sector or non-PEW job," the dp/dX's directly measure the differences in participation, holding constant other factors.

TABLE 3
COMPARISON OF UNIVARIATE AND MULTIVARIATE RESULTS FOR BOWEN-FINEGAN SUBSAMPLE

Percentage Point Difference between Wives of Employed Men and Wives of Men:	INLF	ENTRY	EXIT	WW39
On PEW in 1940				
Univariate	−9.5	0.8	11.0	−10.7
Multivariate	−12.8	0.4	7.7	−14.5
Unemployed in 1940/not on PEW in 1939				
Univariate	9.1	2.1	−5.5	7.1
Multivariate	9.2	1.3	−6.1	7.7
Unemployed in 1940/on PEW in 1939				
Univariate	2.8	1.4	−1.1	1.6
Multivariate	3.5	0.9	−0.8	2.6
Out of labor force				
Univariate	7.4	1.3	−5.9	5.8
Multivariate	9.5	1.0	−7.1	8.5

Notes: INLF indicates in labor force in 1940. ENTRY indicates in labor force in 1940 but did not work in 1939. EXIT indicates out of labor force in 1940 but worked at least one week in 1939. WW39 indicates worked at least one week in 1939. The figures in the table are the percentage point differences in these four variables between wives of employed men and wives of men in the other employment-status categories, computed at the sample means (rows labelled Univariate, from Tables 1 and 2, panel B) or using the logistic coefficients in Appendix Table 1 (rows labelled Multivariate).
Source: See the text and note 29.

married women's labor force participation with respect to husbands' employment status remain after controlling for other factors. Our conclusion about work relief and the added worker effect are not altered by a multivariate analysis.

The regressions also reveal that the likelihood a married woman would participate in the labor force was a function of demographic and household characteristics. The nature of these relationships was conventional for the period. Younger women and women with no own children living at home were more likely to participate than older women or woman with children living at home. Nonwhite women had higher participation rates than white women; more schooling also increased the likelihood of participation. Economic status mattered: participation was a negative function of the husband's predicted weekly wage and homeownership. The effects of childbearing and race operated through both entry and exit transitions, whereas husbands' earnings influenced only the entry decision, not the odds of leaving the labor force once a woman was in it.

Consistent with Bowen and Finegan's findings, a city's female population ratio and its industry mix both influenced the likelihood of participation. The higher the proportion of women in the population, the lower the odds of participation, apparently because of a higher rate of exit. An industry mix biased towards female employment encouraged

participation through a higher entry rate and a lower exit rate. Higher median female earnings increased participation in 1940, but the effect was not significant once other factors were controlled for.[30]

Cross-sectional variation in area unemployment was negatively related to participation in 1940 and to the probability of entry between 1939 and 1940 but had little effect on the exit rate. The impact of area unemployment on participation in 1940 was large: measured at the sample means, a one percentage point increase in unemployment reduced participation by about one percentage point.[31] It is doubtful, however, that cross-sectional variation truly captures a "cyclical" discouraged worker effect—that is, the short-run change in labor supply in response to a short-run change in unemployment. In a comment on Bowen and Finegan's similar findings for 1960, Jacob Mincer argued that cross-sectional variation in unemployment measured persistent differences in labor demand across local labor markets. Mincer based his claim primarily on the stability of the ranking of cities by relative unemployment levels; cities that had high unemployment in one year were likely to have high unemployment the next.[32] Over time, individuals adjusted their labor supply behavior to these persistent differences.

Although we cannot test Mincer's criticism directly, two points are in its favor. First, there is a positive, statistically significant correlation between area unemployment in 1930 and 1940 among the Bowen-Finegan cities (r equals 0.354, significant at the 1 percent level).[33] Second, the probability of market work in 1939 was also negatively related to area unemployment in 1940 (see Appendix Table 1, panel B). The temporal causality of this relationship is incorrect, unless unemployment rates in 1939 and 1940 were positively correlated. Although further work on this issue would be useful, we conclude that the area unemployment coefficients in the regressions of participation in 1940 and of entry transitions are better indicators of the responsiveness of labor supply to persistent changes in unemployment rather than to short-run changes.[34]

[30] If the 1940 participation regression is re-estimated using a specification very similar to the one estimated by Bowen and Finegan (the independent variables are schooling, race, receipt of asset income, husband's wage, presence of own children, and the local labor market variables; see Bowen and Finegan, *Economics*, appendix table B-101, p. 836), the coefficient of female earnings is positive and statistically significant.

[31] The impact is computed using the formula for dp/dx. The conclusion in the text is reached by setting $p = 0.175$, and $\beta = -0.074$ (see Appendix Table 1, panel B); $dp/dx = -0.074 \times 0.175 \times 0.825 = -0.011$.

[32] Mincer, "Labor Force Participation," pp. 76–81. Mincer (ibid., p. 80) also hypothesized that individuals with strong attachment to the labor force would migrate from high unemployment to low unemployment cities. This criticism does not apply to our study, because we excluded migrants.

[33] The unemployment figures for 1930 were derived from U. S. Bureau of the Census, *Fifteenth Census*, table 14. We deflated the city-specific rates by the aggregate unemployment rate in each year before computing the correlation.

[34] We cannot conduct a direct test of how labor supply responds to short-run changes in

CONCLUDING REMARKS

The conventional paradigm for evaluating the economic impact of New Deal relief policies is the Keynesian model. According to this paradigm, fiscal policies like work relief stimulated economic activity through the multiplier.[35] Labor supply disincentives, along with other effects on resource allocation at the microeconomic level, either did not exist or were so trivial as to be irrelevant, because the unemployed in the 1930s were simply that—unemployed, with zero opportunity cost.

The results of this article, along with those of other recent studies of New Deal relief policies, suggest that a fresh look at the conventional wisdom is in order. John Wallis and Daniel Benjamin have recently argued that New Deal relief programs reduced the supply of labor to the private sector, displacing some private employment growth that would have occurred in the absence of the programs.[36] Richard Jensen has suggested that relief may have stigmatized some individuals, making it more likely that they would stay on it and less likely to find attractive private sector employment.[37] Our results add to this small but growing body of literature by demonstrating that New Deal relief policies influenced the labor supply of married women.

More generally, our results illustrate the two fundamental design problems faced by policymakers seeking to aid the unemployed or any low-income group. The first is a targeting problem, which is solved by setting eligibility requirements, such as a means test. The second is to set program parameters (for example, the generosity of relief payments) at levels that satisfy the desire to help those in need but that do not have large disincentive effects. Evidently the WPA could not avoid these dilemmas, any more than the designers of modern welfare programs have been able to under less trying macroeconomic conditions.[38] Further research is necessary to determine if institutional features of work relief affected labor supply decisions within families other than those of married women, or other aspects of household behavior.

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unemployment because we do not know the precise change in area unemployment between 1939 and 1940. We did, however, experiment with a proxy for the change in area labor demand between 1939 and 1940 (see the Appendix for details on the construction of this proxy variable). If this variable is substituted for the area unemployment rate, its coefficient is positive and significant in the regression of married women's labor force participation in 1940, but the magnitude of the coefficient is considerably smaller—specifically, a one percentage point increase in labor demand results in a 0.4 percentage point increase in labor force participation in 1940.

[35] See Brown, "Fiscal Policy," and Peppers, "Full Employment Surplus Analysis."

[36] Wallis and Benjamin, "Private Employment." For the opposite point of view, that displacement was small, see Kesselman and Savin, "Three-and-a-Half Million Workers."

[37] Jensen, "Causes and Cures."

[38] For a comprehensive discussion of recent research on design problems in modern welfare programs, see Moffit, "Incentive Effects." Whether the WPA was aware that its policies had reduced the size of the added worker effect is not known. It is not clear to us, however, that the agency would have been officially displeased by the results of our article. Social norms in the 1930s did not advocate labor force participation by married women. A married woman's place was in the home, not the labor market.

Finally, while our regressions suggest that the responsiveness of the labor supply of married women in the late 1930s to short-run movements in aggregate demand was smaller than previously thought, the responsiveness to sustained increases in labor demand may have been quite large. Such a sustained increase occurred during World War II. Among women 18 to 45 years old who were not in the labor force at the time of Pearl Harbor, 14.3 percent were in the labor force in March of 1944.[39] On a quarterly basis, this translates into an entry rate of about 1.7 percent per quarter, compared with an entry rate of 1.1 percent in our full sample (see Table 2, panel A, the row labelled Total).[40] The official unemployment rate in 1944 was 1.2 percent.[41] Using the logistic coefficient of the area unemployment rate in the regression of entry transitions (−0.068, see Appendix Table 1, panel B), a decrease in area unemployment from 12.4 percent (the mean in the Bowen-Finegan subsample) to 1.2 percent implies an increase in the entry rate of 8.2 percentage points, compared with the actual increase of 6 percentage points.[42] Thus, our results imply that increases in aggregate demand during the war years were a major factor behind the increase in the entry rate.[43]

[39] Goldin, "Role," p. 748.

[40] The entry rate, p, is computed from the following equation:

$$1 - (1 - p)^n = F$$

where n is the number of quarters and F is the proportion entering. In the application in the text, $n = 9$ (there were approximately nine quarters between December 1941 and March 1944, the time period to which the calculation refers) and $F = 0.143$.

[41] U. S. Bureau of the Census, *Historical Statistics*, p. 135.

[42] The absolute value of the elasticity of the entry rate with respect to area unemployment, computed at the sample means using the formula $xdp/pdx = \beta x(1 - p)$, with $x = 12.4$ and $p = 0.012$, is 0.83. A reduction in unemployment from 12.4 percent to 1.2 percent is a decrease of 90.3 percent (= 11.2/12.4). The predicted increase in the entry rate is 74.7 percent (= 0.83 × 90.3), or 8.2 percentage points (= 1.1 × 0.747).

[43] We would not emphasize that the regression coefficient "overexplains" the increase in the entry rate, for two reasons. First, the official unemployment rate of 1.2 percent in 1944 overstates the level of aggregate demand (as it affected the demand for the labor of married women) because some of the measured decline in unemployment in the early 1940s was an artifact of the draft; see Higgs, "Wartime Prosperity," pp. 42–44. If the "true" decline in unemployment was half the measured decline, the predicted increase in the entry rate would be 4.6 percentage points (= 1.1 × 0.83 × 0.5). Second, it is known that married women were much more likely to work in the early 1940s if their husbands were at war than if they were at home, so conscription per se encouraged entry. Goldin ("Role," p. 750) also concludes that increases in aggregate demand encouraged entry.

Appendix: Data Description

Data on the labor force status, economic and demographic characteristics of each married woman and her husband were taken directly from the public use sample of the 1940 census, as were data on homeownership, region, and receipt of nonwage income by the household. Each of these variables is defined in the text, the tables, or relevant

footnotes. The full sample included all nonfarm, nonmigrant, nondisabled married women, 14 to 54 years old, who were living with a non-self-employed husband during the census week.

The Bowen and Finegan (B-F) subsample comprised those married women in the 1940 PUMS (as described in the text) residing in 71 urban areas. Most of these areas were cities of 100,000 population or more that had been included as observations in the original B-F intercity regressions for 1940.[44] There were 92 cities in the original regressions, but central-city residents in 20 of them were not identified by city in the 1940 PUMS, either to protect confidentiality of respondents, or because the city was not classified as a central city of a standard metropolitan area (SMA) in 1950 (the classification used in constructing the 1940 PUMS). Most of these cities had to be dropped from the reconstructed B-F sample, but we were able to salvage five of them by using observations for the SMA containing the (unreported) central city. We made such substitutions only when the central city accounted for over half of the total population of the SMA (recall that residents of farms were excluded from our sample). In three cases, we combined nearby pairs of central cities (for example, Minneapolis and St. Paul) into a single urban area when these cities belonged to the same SMA and had very similar unemployment rates in 1940.

Data on the city-level labor market variables, except for our measure of the change in labor demand, were taken directly from the original work sheets of the B-F study; the definitions and original sources of these variables are as follows:

City Unemployment Rate. The percentage of the total labor force, ages 14 and over that was seeking work in the census week of 1940. *Source*: U. S. Bureau of the Census, *Sixteenth Census of the United States: 1940, Population, Volume III*, table 5.[45]

Industry Mix. A measure of the percentage of jobs in each city that would be expected to be held by women, based on the industrial breakdown of total employment. For a detailed explanation of how this variable was constructed, see Bowen and Finegan, *Economics*, appendix B, pp. 772–74. *Source*: U. S. Bureau of the Census, *Sixteenth Census of the United States: 1940, Population, Volume III*, table 17.

Percent Female. The percentage of the city's total population, ages 14 and over, that was female. *Source*: U. S. Bureau of the Census, *Sixteenth Census of the United States: 1940, Population, Volume III*, table 5.

Earnings of Females. Estimated median wage or salary income received in 1939 by all females in the city who worked 12 months and earned at least $100.00 of such income that year. *Source*: U. S. Bureau of the Census, *Sixteenth Census of the United States: 1940, Population, Volume III*, table 16.

Proxy for Change in Labor Demand between 1939 and 1940 (see note 34). This new variable measures the percentage point change between 1939 and the census week of 1940 in the ratio of full-time equivalent employment to experienced labor force of male wage and salary workers who were in the labor force during the census week, excluding persons on work relief. It is a proxy for the extent to which the city-specific demand for non-PEW labor increased (or decreased) over this period. The employment-to-experienced labor force ratio for 1939 is estimated as the average number of months worked in 1939 per wage and salary worker as a fraction of 12 months. The employment-to-experienced labor force ratio for the census week is computed directly from the census figures on

[44] The original 1940 B-F regression for married women is reported in Bowen and Finegan, *Economics*, appendix table B-101, pp. 836–37.

[45] Contrary to the stated definition of this variable in Bowen and Finegan, *Economics*, appendix table B-100, p. 835, persons on work relief were *not* counted as unemployed in the original Bowen-Finegan regressions.

labor force status. Further details on the construction of this variable are available from the authors. *Source*: U.S. Bureau of the Census, *Sixteenth Census of the United States: 1940, Population: Volume III*, tables 22, 23.

A floppy disk containing the city-level data is available from Robert A. Margo on request.

APPENDIX TABLE 1
LOGISTIC REGRESSIONS

Variable	INLF	ENTRY	EXIT	WW39
	A. Sample Means			
Wife				
Age				
25–34	0.328	0.310	0.406	0.328
35–44	0.330	0.333	0.317	0.330
45–54	0.251	0.273	0.155	0.251
Years of schooling				
5–8	0.459	0.472	0.401	0.459
9–12	0.384	0.373	0.431	0.384
≥13	0.065	0.058	0.097	0.065
Nonwhite	0.087	0.075	0.139	0.087
Husband				
Predicted weekly wage	31.02	31.33	29.70	31.02
On PEW in 1940	0.046	0.052	0.019	0.046
Unemployed in 1940				
Not on PEW in 1939	0.064	0.058	0.087	0.064
On PEW in 1939	0.009	0.009	0.010	0.009
Out of labor force	0.042	0.039	0.055	0.042
Household				
Own home	0.281	0.296	0.218	0.281
Asset income in 1939	0.202	0.200	0.208	0.202
Own child under age 18 present	0.606	0.659	0.375	0.606
Region				
Midwest	0.345	0.351	0.318	0.345
South	0.156	0.144	0.206	0.156
West	0.094	0.091	0.106	0.094
SMA				
Unemployment rate	12.3	12.4	12.0	12.3
Industry mix	30.3	30.2	30.7	30.3
Female earnings $\times 10^{-2}$	9.019	9.029	8.977	9.019
Percent female	51.3	51.3	51.5	51.3
Dependent variable mean	0.175	0.012	0.124	0.188
N	46,576	37,809	8,766	46,576
	B. Logistic Coefficients			
Constant	1.341	−0.744	−6.932	0.615
	(0.937)	(3.372)	(2.368)	(0.912)
Wife				
Age				
25–34	0.308	−0.054	−0.539	0.239
	(0.040)	(0.154)	(0.102)	(0.045)

APPENDIX TABLE 1—continued

Variable	INLF	ENTRY	EXIT	WW39
35–44	0.079	−0.378	−0.771	−0.013
	(0.051)	(0.173)	(0.123)	(0.050)
45–54	−0.798	−0.869	−0.564	−0.895
	(0.058)	(0.198)	(0.144)	(0.056)
Years of schooling				
5–8	0.186	0.492	0.166	0.177
	(0.054)	(0.188)	(0.156)	(0.053)
9–12	0.326	0.318	0.268	0.359
	(0.058)	(0.209)	(0.165)	(0.057)
≥13	0.807	0.683	0.095	0.827
	(0.074)	(0.283)	(0.202)	(0.073)
Husband				
Predicted weekly wage	−0.021	−0.021	−0.003	−0.022
	(0.003)	(0.010)	(0.007)	(0.003)
On PEW in 1940	−0.889	0.349	0.709	−0.951
	(0.087)	(0.186)	(0.191)	(0.085)
Unemployed in 1940				
Not on PEW in 1939	0.638	1.085	−0.569	0.505
	(0.048)	(0.144)	(0.145)	(0.048)
On PEW in 1939	0.245	0.804	−0.078	0.169
	(0.131)	(0.368)	(0.345)	(0.130)
Out of labor force	0.658	0.812	−0.651	0.558
	(0.061)	(0.199)	(0.188)	(0.061)
Household				
Own home	−0.230	−0.485	0.006	−0.217
	(0.033)	(0.137)	(0.085)	(0.032)
Asset income in 1939	0.076	0.299	0.114	0.085
	(0.034)	(0.116)	(0.084)	(0.033)
Own child under age 18 present	−1.380	−0.798	0.709	−1.354
	(0.027)	(0.100)	(0.069)	(0.027)
Region				
Midwest	−0.036	0.029	−0.236	−0.095
	(0.058)	(0.216)	(0.133)	(0.055)
South	−0.055	0.128	−0.229	−0.122
	(0.068)	(0.253)	(0.160)	(0.066)
West	0.004	0.077	0.118	0.007
	(0.064)	(0.248)	(0.147)	(0.062)
SMA				
Unemployment rate	−0.074	−0.068	−0.011	−0.080
	(0.009)	(0.003)	(0.021)	(0.008)
Industry mix	0.058	0.040	−0.061	0.050
	(0.007)	(0.027)	(0.018)	(0.007)
Female earnings × 10^{-2}	0.012	−0.020	0.017	0.018
	(0.013)	(0.047)	(0.033)	(0.012)
Percent female	−0.054	−0.060	−0.138	−0.030
	(0.019)	(0.068)	(0.047)	(0.018)
−2 × Log likelihood	38,372.12	4,616.50	6,303.52	40,156.78

Notes: INLF equals one if wife was in the labor force in 1940, zero otherwise. ENTRY equals one if wife did no work in 1939 and was in the labor force in 1940, zero if she was not in the labor force in 1940. EXIT equals one if wife worked at least one week in 1939 but was not in the labor force in 1940, zero if she was in the labor force in 1940. WW39 equals one if wife worked at least one week in 1939. Absolute values of standard errors of logistic coefficients are shown in parentheses in panel B.

Sources: Data Description, the Appendix.

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