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A Note on Employment Participation Elasticities from the Earned Income Tax Credit Literature

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Corinth et al. (2021) simulate the labor supply effects of a proposed expansion of the Child Tax Credit (CTC) in order to determine the policy's anti-poverty effect. To simulate exit from employment among current workers, they use an employment participation elasticity of 0.75 for single mothers receiving the Earned Income Tax Credit (EITC), and 0.25 for all other workers. Some have argued that the 0.75 elasticity for single mother EITC recipients is too high, and that it is inconsistent with the EITC literature.

In this note, we show that the choice of a 0.75 employment participation elasticity for single mothers is supported by the EITC literature, and in fact is lower than that implied by some of the most notable studies. We first briefly recount other summaries of the magnitude of the participation elasticity for single mothers, which each suggest an elasticity of around 0.75. Next we turn to four individual studies of the responsiveness of employment participation to the return to work.

We focus on Hoynes and Patel (2018a), which is recent and was used as the basis for simulations by the 2019 National Academy of Sciences (NAS) report on reducing child poverty (NAS 2019). Based on Hoynes and Patel (2018a), a $1,000 increase in average EITC benefits increases employment participation among single mothers by 5.1 percentage points and implies a participation elasticity of 1.25 (see Table 1). Based on an appropriately adjusted estimate from Schanzenbach and Strain (2020), a $1,000 increase in average EITC benefits increases employment participation among single mothers by 3.2 percentage points and implies a participation elasticity of 0.85. Meyer and Rosenbaum (2001) estimate that a $1,000 increase in average EITC benefits increases employment participation by a slightly lower 2.9 percentage points and implies a participation elasticity of 0.67. Finally, an appropriately adjusted estimate from Keane and Moffitt (1998) implies that a $1,000 increase in average EITC benefits increases

employment participation by a much higher 7.5 percentage points and implies a participation elasticity of 1.68. Thus, the 0.75 elasticity used for EITC recipient single mothers in Corinth et al. (2021) is either similar to or more conservative than estimates based on these notable studies.

Table 1. Change in Probability of Employment Participation During the Year among Single Mothers Due to $1,000 Increase in Earned Income Tax Credit Benefit, and Employment Participation Elasticity, Select Studies

	Change in probability of employment participation during year		
	Unadjusted value based on $1,000 increase in study base year dollars	Adjusted value based on $1,000 increase in 2021 dollars	Employment Participation Elasticity
Hoynes and Patel (2018a)	0.056	0.051	1.25
Schanzenbach and Strain (2020)	0.019[a]	0.032[b]	0.85
Meyer and Rosenbaum (2001)	0.045	0.029	0.67
Keane and Moffitt (1998)	0.074[a]	0.075[b]	1.68

Source: Hoynes and Patel (2018b), Appendix Table 7; Schanzenbach and Strain (2020), Table 5, Appendix Table A1; Meyer and Rosenbaum (2000), Table 2; Meyer and Rosenbaum (2001), Table 2, Table 4; Keane and Moffitt (1998), Table 7; authors' calculations

Note: Adjusted values of the change in the probability of employment consider a $1,000 increase in average EITC benefits in 2021 dollars, updated based on the personal consumption expenditure price index. Employment participation elasticity is equal to the percent change in the probability of employment divided by the percent change in the return to work. The percent change in the probability of employment is equal to the change in the probability of employment participation during the year due to a $1,000 increase in average EITC benefits (in the study's base year dollars) divided by the baseline employment rate. The percent change in the return to work is equal to $1,000 divided by the baseline return to work (in the study's base year dollars). See text for further details.

[a] Unadjusted value based on $1,000 increase in maximum EITC benefits and, in the case of Keane and Moffit (1998), employment during the month.

[b] In addition to adjusting to 2021 dollars, we increase the Schanzenbach and Strain (2020) value by 73% to adjust for their use of maximum EITC benefits rather than average EITC benefits. We increase the Keane and Moffit (1998) value by 73% to adjust for their use of maximum EITC benefits, and by 32% to adjust for their employment period of a month instead of year. See text for further details.

Below, we recount other summaries of the employment participation elasticity for single mothers. Then we describe in more detail the employment participation response to a change in EITC benefits for each of the four studies shown in Table 1. We conclude by showing how our employment participation elasticities appear to be lower than those implied by simulations in NAS (2019).

While it should be evident that there are many different participation elasticities we could calculate, we focus on those most relevant to the proposed changes in the CTC. Because the CTC is determined by employment over a calendar year, we focus on the effect of taxes on employment

at all during a year. We also include a value for food stamps/Supplemental Nutrition Assistance Program benefits and housing benefits in the return to work, but not a value of Medicaid or other health insurance. The related literature tends to find that the low-income population often values Medicaid at a small fraction of its cost (Keane and Moffitt 1998; Meyer and Rosenbaum 2001; Finkelstein, Hendren, and Luttmer 2019; Finkelstein, Hendren, and Shepard 2019).

Summaries of elasticities

Summaries of the literature on labor supply responses by single mothers to the EITC have concluded that single mothers are responsive to the return to work, with a participation elasticity similar to the 0.75 baseline value used in Corinth et al. (2021). In a Congressional Budget Office working paper, McClelland and Mok (2012) conclude that participation elasticities for lower-income workers eligible for the EITC range from 0.3 to 1.2. The midpoint of this range is 0.75. Gelber and Mitchell (2012) write that participation elasticities for single mothers range from "0.35 to 1.7, with a central tendency of 0.7" (p. 873). Nichols and Rothstein (2016) state that "consensus estimates of the extensive-margin elasticity [are] around 0.7 to 1.0" (p. 198). Goldin, Maag, and Michelmore (2021) echo this conclusion of Nichols and Rothstein (2016), noting that participation elasticities "approach 0.70 to 1.00 for single mothers" (p. 7).

Hoynes and Patel (2018a)

Hoynes and Patel (2018a) is important to consider individually because it was used as the basis for simulations in the 2019 NAS report on reducing child poverty (NAS 2019). Hoynes and Patel (2018a) estimate that a $1,000 increase in federal EITC benefits (in 2016 dollars) increases employment participation among single mothers during the year by 5.6 percentage points (see final column of their Appendix Table 7).[1] A $1,000 increase in 2021 dollars would increase participation by 5.1 percentage points. We focus on this particular estimate because it was the estimate used by NAS (2019) to simulate the labor supply effects of an expansion of EITC benefits.

We do not rely on the elasticity estimates reported in Hoynes and Patel (2018b) because they do not seem consistent with their estimated employment effect with respect to an increase in

[1] Appendix Table 7 in Hoynes and Patel (2018b) does not indicate the year in which dollar amounts are expressed, but we note that Appendix Figure 1 is expressed in 2016 dollars, and Appendix Figure 2 is expressed in 2014 dollars. We obtain an adjusted estimate of 5.1 percentage points when converting to 2021 dollars regardless of whether we use 2014 or 2016 as the base year.

EITC benefits. To see this, note that the standard formula for the elasticity of employment participation with respect to a change in the return to work is

$$\epsilon = \frac{\%\ change\ in\ employment}{\%\ change\ in\ return\ to\ work}$$

The elasticity reported in the final column of Appendix Table 7 is 0.32. The percent change in employment participation due to a $1,000 increase in federal EITC benefits (in 2016 dollars, reported in Appendix Table 7) is 0.07. The percent change in the return to work is the dollar change in the return to work ($1,000) divided by the baseline return to work. We can plug these values into the equation above to back out the implied baseline return to work b.

$$0.32 = \frac{0.07}{1{,}000/b}$$

Solving for b, we see that the baseline return to work is $4,571 (in 2016 dollars). This value seems implausibly low. Meyer and Rosenbaum (2000) estimate that the average return to work for single mothers in 1996 was $17,895 (in 2016 dollars).[2] Using this value as the baseline return to work yields an elasticity of 1.25. Because Hoynes and Patel (2018b) calculate their elasticities in a nonstandard way and do not report the means that are inputs into their calculations, it is not clear why their reported elasticities are much lower.[3]

Schanzenbach and Strain (2020)

In a study of all EITC expansions since the program was introduced in 1975, Schanzenbach and Strain (2020) estimate that a $1,000 (in 2019 dollars) increase in maximum federal and state EITC benefits increases the probability of single mothers working during the year by 1.9 percentage points (see their Table 5). In 2021 dollars, a $1,000 increase in maximum EITC benefits increases the probability of employment by 1.8 percentage points.

The effect of increasing the average EITC benefit would be larger than the effect of increasing the maximum EITC benefit. Between 1990 and 1996, the maximum EITC benefit for one-child families increased by $1,038 (in 1996 dollars), 1.73 times the $601 (in 1996 dollars) decrease in taxes paid by single mothers with one child and average earnings over this period,

[2] To be consistent with the Hoynes and Patel (2018a) income definition, the return to work values from Meyer and Rosenbaum (2000) exclude the value of Medicaid.

[3] In the equation on page 3 of the appendix, it is unclear whether the employment change estimate in the numerator is defined consistently with the change in the return to work in the denominator.

driven by the EITC expansion (Meyer and Rosenbaum 2000; Tax Policy Center 2021). The maximum EITC benefit for two or more child families increased by $2,442 (in 1996 dollars), 1.80 times the $1,356 (in 1996 dollars) decrease in taxes paid by single mothers with two or more children and average earnings (Meyer and Rosenbaum 2000; Tax Policy Center 2021).[4] Thus, the effect on employment of increasing the average EITC benefit by $1,000 should be at least 1.73 times the effect of increasing the maximum EITC benefit by $1,000. Applying this adjustment factor, a $1,000 increase in average EITC benefits increases participation in employment by 3.2 percentage points.

We next calculate the employment participation elasticity implied by Schanzenbach and Strain (2020). We calculate the percent change in employment as the adjusted change in the probability of employment (0.033) due to a $1,000 increase in average EITC benefits (in 2019 dollars), divided by the 1989-1998 mean employment rate for single mothers of 0.73 reported in Appendix Table A1 of Schanzenbach and Strain (2020). The percent change in the return to work is $1,000 divided by the return to work for single mothers, which we take as the average return to work in 1996 taken from Table 2 of Meyer and Rosenbaum (2000) and inflated to 2019 dollars, for a value of $18,869. The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 0.85.

Schanzenbach and Strain (2020) separately consider single mothers with a high school diploma or less. Using the same methodology above except relying on the Schanzenbach and Strain (2020) employment estimates for this subpopulation, a $1,000 increase in average EITC benefits increases participation in employment by 4.8 percentage points for these lower educated single mothers. Their implied employment participation elasticity is 1.45.

Meyer and Rosenbaum (2001)

Meyer and Rosenbaum (2001) estimate the change in employment participation among single mothers in response to expansion of the EITC in the 1980s and 1990s. In their Table IV, they report that a $1,000 increase in the return to work (due to a $1,000 decrease in taxes, driven by an expansion of the EITC) would increase employment participation during the year among single mothers by 4.5 percentage points. Converting the $1,000 increase in the return to work to

[4] This calculation likely underestimates how much we should scale up the elasticity because the average EITC benefit will be less than the benefit evaluated at average earnings given the concavity of the EITC schedule.

2021 dollars, the estimate is 2.9 percentage points. This estimate is similar to the 3.2 percentage point effect from Schanzenbach and Strain (2020).

The implied employment participation elasticity based on Meyer and Rosenbaum (2001) is similar as well. The percent change in employment is equal to the change in the probability of employment due to a $1,000 increase in average EITC benefits (in 1996 dollars), 0.045, divided by the baseline employment rate, 0.78, the average of the single mother employment rate in 1984 and 1996 (the first and last year of the study period in Meyer and Rosenbaum 2001). The percent change in the return to work is $1,000 divided by the baseline return to work, $11,531 (in 1996 dollars), the average of the baseline return to work in 1984 and 1996 reported in Meyer and Rosenbaum (2000). The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 0.67.[5]

Keane and Moffitt (1998)

In a final study that estimates the effect of the EITC on labor supply, Keane and Moffitt (1998) simulate the change in the probability of working in a given month among single mothers due an increase in the maximum EITC benefit. In their Table 7, they report that the probability of not working falls from 34.6% at baseline to 27.2% after an increase in the maximum EITC benefit from $500 (its 1984 level) to $1,500.[6] Thus, increasing the maximum EITC benefit by $1,000 in 1984 dollars increases participation in employment among single mothers by 7.4 percentage points (the difference between 34.6% and 27.2%). Adjusted for inflation, increasing the maximum EITC benefit by $1,000 (in 2021 dollars) would increase participation in employment by 3.3 percentage points. The effect of increasing the average EITC benefit would be larger than the effect of increasing the maximum EITC benefit. Applying the same 1.73 adjust factor previously derived, a $1,000 increase in average EITC benefits increases participation in employment by 5.7 percentage points.

We would expect the employment participation effect to be even larger if the authors had instead considered employment at any point during the year, as considered by Hoynes and Patel (2018a), Schanzenbach and Strain (2020) and Meyer and Rosenbaum (2001), rather than at any

[5] Nichols and Rothstein (2016) note that the implied elasticity from Meyer and Rosenbaum (2001) is about 0.7.
[6] Keane and Moffitt (1998) consider a policy of increasing maximum EITC benefits from $500 to $1,500, increasing the phase-in rate from 10% to 30%, and increasing the phase-out rate from 12.5% to 20%. See Tax Policy Center (2021) for a history of EITC parameters from 1975 to 2001.

point during the month. Meyer and Rosenbaum (2001) find that the responsiveness to the return to work is 64% higher when considering work during the year rather than work during a given week. Thus, we would expect the estimate for employment during the year to be between 0% and 64% higher than the Keane and Moffitt (1998) estimate for employment during the month. We take the midpoint of 32% and thus adjust their effect upward to 7.5 percentage points.

We also calculate the employment participation elasticity implied by Keane and Moffitt (1998). First we adjust upward the change in the probability of employment due to a $1,000 increase in maximum EITC benefits (in the study's 1984 baseline dollars) by 73% to convert to an increase in average benefits, and by an additional 32% to account for consideration of employment during a year rather than a month as discussed earlier. We calculate the percent change in employment as the adjusted change in the probability of employment (0.169) divided by the 1984 employment rate for single mothers of 0.73 reported in Table 2 of Meyer and Rosenbaum (2001). The percent change in the return to work is $1,000 divided by the return to work for single mothers in 1984 (in 1984 dollars), of $7,284, taken from Table 2 of Meyer and Rosenbaum (2000) and then deflated. The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 1.68.

Conclusions

The 0.75 elasticity used by Corinth et al. (2021) is supported by the academic literature on the labor supply effects of the EITC. In fact, the recent literature relied upon by NAS (2019), i.e., Hoynes and Patel (2018a), suggests that Corinth et al. (2021) understated the elasticity for single mother EITC recipients. This conclusion is consistent with the degree of responsiveness to tax changes in the simulations from the NAS report on reducing child poverty (NAS 2019). Using the estimate from Hoynes and Patel (2018a) that a $1,000 increase in EITC benefits increases employment participation among single mothers by 5.6 percentage points (before adjusting to 2021 dollars), NAS (2019) finds that a 40% increase in EITC benefits would bring 0.77 million new single mothers into employment. Assuming linearity and symmetry, this would imply that eliminating the EITC would lead 1.9 million single mothers to exit employment.[7] Corinth et al. (2021)—using the elasticities of 0.75 for single mother EITC recipients and 0.25 for all other

[7] If anything, one would expect a proportionately larger effect of the reduction in incentives given that there is likely a diminishing return to incentives that increase the desirability of employment.

workers—estimate that eliminating the EITC would lead 1.7 million total workers to exit employment.[8] The lower estimate in Corinth et al. (2021), despite its inclusion of workers who are not single mother EITC recipients, appears to reflect the lower assumed responsiveness to the return to work for single mother EITC recipients in the paper.

[8] These calculations do not include individual workers in dual earner couples that may enter employment due to the elimination of the EITC phaseout, which we do not incorporate because it is not very relevant when comparing the EITC to the CTC as the latter has its phaseout at high earnings.

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