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The U.S. Earned Income Tax Credit (EITC) policy is meant to encourage work among low-income individuals who might otherwise receive public assistance benefits and not work.

In 1987, the EITC was greatly expanded. The group expected to be most affected by this policy is **single women with children** because they were the largest group of taxpayers eligible for the EITC. We can use **single women without children** as a comparison group, because they are a similar group *not* affected by the policy.

We are interested in the effect of the EITC expansion on the labor force participation of **single women with children**, as compared to single women without children.

We have data on the labor force participation ( $lfp_i$ ) before and after the expansion. We also have a variable in the dataset that tells us whether the data on female labor force participation was collected before or after expansion ( $after_i$ ). Note that, for the remainder of this part, we will restrict the sample to only people who self-identified as female.

We write down the following SRF:

$$l\hat{f}p_i = \hat{\beta}_0 + \hat{\beta}_1 children_i + \hat{\beta}_2 after_i + \hat{\beta}_3 children_i \times after_i$$

- (4 pts) 4. Which coefficient represents the effect of the EITC expansion on the labor force participation of single women with children, as compared to single women without children? Explain your reasoning.

**Solution:**  $\hat{\beta}_3$  represents this effect because the coefficient on the interaction between  $children_i$  and  $after_i$  tells us the predicted change in LFP after the expansion ( $after_i$ ) for single women with children ( $children_i$ ) where the reference groups (or comparison groups) are before the EITC expansion and single women without children, respectively. Thus,  $\hat{\beta}_3$  represents the effect of the EITC expansion on the LFP of single women with children compared to single women without children.

- (6 pts) 5. An academic paper<sup>1</sup> actually studied this policy, and estimated the following labor force participation rates of each of the following groups:
- Before expansion:
    - Women with children: 0.729
    - Women without children: 0.952
  - After expansion:

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<sup>1</sup>Eissa, N., & Liebman, J. B. (1996). "Labor Supply Response to the Earned Income Tax Credit." *The Quarterly Journal of Economics*, 111(2), 605-637.

- Women with children: 0.753
- Women without children: 0.952

Using the numbers above, write the SRF using numbers instead of  $\hat{\beta}$ s.

**Solution:**

$$l\hat{f}p_i = 0.952 - 0.223children_i + 0.000after_i + 0.024children_i \times after_i$$

How we find the numbers in the SRF:

- Before expansion:
  - Women with children: 0.729 (corresponds to  $\hat{\beta}_0 + \hat{\beta}_1$ )
  - Women without children: 0.952 (corresponds to  $\hat{\beta}_0$ )
- After expansion:
  - Women with children: 0.753 (corresponds to  $\hat{\beta}_0 + \hat{\beta}_1 + \hat{\beta}_2 + \hat{\beta}_3$ )
  - Women without children: 0.952 (corresponds to  $\hat{\beta}_0 + \hat{\beta}_2$ )

Thus,

- $\hat{\beta}_1 = (\hat{\beta}_0 + \hat{\beta}_1) - \hat{\beta}_0 = 0.729 - 0.952 = -0.223$
- $\hat{\beta}_2 = (\hat{\beta}_0 + \hat{\beta}_2) - \hat{\beta}_0 = 0.952 - 0.952 = 0.000$
- $\hat{\beta}_3 = [(\hat{\beta}_0 + \hat{\beta}_1 + \hat{\beta}_2 + \hat{\beta}_3) - (\hat{\beta}_0 + \hat{\beta}_1)] - [(\hat{\beta}_0 + \hat{\beta}_2) - (\hat{\beta}_0)] = (0.753 - 0.729) - (0.952 - 0.952) = 0.024$