The Welfare Effects of Welfare and Tax Reform during the Great Recession[*]

PROJECT DESCRIPTION - PRELIMINARY

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Abstract

Recent decades have witnessed a large shift in the U.S. tax and transfer system away from unconditional transfers to aid the poor towards making transfers and tax credits conditional on working. In particular for single mothers incentives to work increased dramatically through the Welfare reform in 1997 and the stepwise expansion of the Earned Income Tax Credits (EITC). In this research project we investigate whether the shift towards making transfers conditional on working comes with costs during deep recessions, such as the 2008/2009 recession, when labor markets are particularly bad. In such an environment the targeted population may be unable to find jobs at all and thus rather than moving people from non-employment to employment, making benefits conditional on working only leads to large cuts in transfers to the affected (very poor) population. To analyze this we use data from the CPS and state-year level variation in taxes and transfers to measure how labor supply elasticities vary with the economic environment and show how these estimates can be used to determine how the design of the optimal tax and transfer system depends on labor market conditions.

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1 Project Description

The two decades between the mid-1980s and early 2000s have witnessed a large shift in the U.S. tax and transfer system away from unconditional transfers to aid the poor towards making transfers and tax credits conditional on working. In particular for single mothers incentives to work increased dramatically: welfare benefits were cut and time limits introduced, the Earned Income Tax Credits was expanded and changes in Medicaid, training programs and child care provision encouraged work.

The literature evaluating these policy changes seems to largely view them as successful. On the one hand the reforms sharply reduced welfare caseloads and increased labor force participation of single Mothers (e.g. Eissa and Liebman 1996, Meyer and Rosenbaum 2001, and Eissa and Hoynes 2006) while on the other hand consumption levels have slightly increased or remained the same (Meyer and Sullivan 2004, 2008) over the 1990 and early 2000s. Furthermore within an optimal income taxation framework, the various tax policy changes seem to have had a substantially positive effect on welfare (see Eissa, Kleven and Kreiner 2008).

It is important to note however, that these policy evaluations are all based mainly on experiences from the 1990s and early 2000s when the economy was performing quite well and unemployment rates were declining dramatically or at least remained at historically relatively low levels (even the peak of the 2003 recession had unemployment at only 6.3 percent). Since 2008, the economic environment has changed dramatically with unemployment rising above 10 percent and remaining high for a prolonged period of time.

This raises a potential concern: Increasing the returns to work, by making transfers and tax credits conditional on working, may be an effective tool to increase labor force participation when it is relatively easy for single mothers to enter the labor force and find jobs. However, when there are no jobs available then making transfers conditional on working may not lead to increased employment but instead may sharply reduce consumption and

wellbeing of the targeted population. In this case it may in fact be preferable to have the design of transfers to the poor depend on the state of the business cycle, with less work requirements during economic downturns and more work incentives during upswings.

In this paper we address this concern by assessing how the optimal tradeoff between unconditional transfers and providing work incentives through conditionality depends on the economic environment. Building on prior theory (e.g. Saez 2002), we show that the optimal tradeoff depends on how extensive and intensive labor supply elasticities vary with the economic environment.[1] This is in spirit of the recent focus in public finance on describing optimal policy in a sufficient statistics framework, which allows for directly linking policies to statistics that are easily estimated in the data (see Chetty 2009). Using data from the Current Population Survey (CPS) and state-year level variation in welfare policies (AFDC, TANF, SNAP and Medicaid) , as well as state and federal income taxes (incl. EITC) for over 20 years, we estimate how the labor supply effects of these programs vary with state unemployment rates. The implied labor supply elasticities can then be used to calculate how the tax and transfer reforms have affected overall welfare during the 2008 and 2009 recession.

This paper is also closely related to recent research on whether the generosity of unemployment benefits should vary over the business cycle. Unemployment benefits create a similar problem as traditional welfare benefits in that they provide transfers that are conditional on not working (or at least are at their maximum) and thus provide incentives not to work, while at the same time providing important insurance against hardship. Just as in the optimal taxation literature, the efficiency loss from providing unemployment insurance (UI) is inversely related to the labor supply elasticities. Schmieder, von Wachter and Bender (2012), Landais, Michaillat, and Saez (2010), Kroft and Notowidigdo (2011) derive welfare formulas where the marginal effect of increasing the generosity of unemployment benefits depends on the elasticity of unemployment durations with respect to the benefit generosity.

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[1]Saez (2002) extends the Mirrlees (1971) and Diamond (1980) framework to show that for optimal policy the tradeoff between conditional and unconditional transfers depends on the relative magnitude of extensive versus intensive margin labor supply elasticities. However, while a large literature has estimated these effects, little is known about the cyclicality of these elasticities.

These papers provide evidence that the labor supply elasticities determining the optimal benefit durations (Schmieder et al.) and levels (Landais et al. and Kroft and Notowidigdo) decline during recessions and that the generosity of the UI system should therefore increase during a recession.

2   Preliminary Evidence

Previous work (Saez, 2002) shows that the optimal tax and transfer schedule, especially towards the lower end of the income distribution, depends critically on the magnitudes of two elasticities: the extensive elasticity, or the propensity to leave or enter the workforce in response to potential income changes, and the intensive elasticity, the propensity to adjust the number of hours worked in response to changes in the marginal tax rate implied by the tax schedule. A sizable unconditional transfer phased out with high marginal tax rates is optimal when the intensive elasticity is large and the extensive elasticity is small. The high phase out rates limits the number of individuals exposed to the incentive to reduce hours worked provided by the high marginal tax rate. When the extensive elasticity is high and the intensive is low, a negative marginal rate may be optimal since it encourages people who where not working into the labor force without encouraging higher wage earners to reduce hours.

We hypothesize that the elasticities fluctuate with changes in the labor market, implying that the optimal tax and transfer schedule should adjust with labor market conditions. To support this hypothesis we first look the EITC reform that began in 1993. Figure 1 plots the maximum EITC benefits depending on the number of children in the household. The highlighted region, 1992-1997 contains a major expansion of EITC benefits, especially for individuals with children. Figure 2 plots labor force participation rates for single women with children across the highlighted timeframe. The first row considers all single mothers with children, the second row isolates the subsample of single mothers in states with low unemployment and the third column considers only the subsample of single mothers in

3

states with relatively high unemployment rates. Single mothers with lower education tend to be those that are affected most by changes in EITC. As expected, women with higher education tend to be working at higher rates. Across all samples we see increased labor force participation by the lower educated women relative to women with higher education. The narrowing employment gap could be in part due to the increased incentives resulting from the EITC changes. The employment gap narrows to a much greater extent in the states with low unemployment than in high unemployment states. Furthermore, the greatest narrowing of the employment gap for high unemployment states occurs only after average unemployment in those states dips below a historically modest 6 percent. This relationship is consistent with our hypothesis that individuals are more responsive to changes in work incentives when labor market conditions are favorable.

Regression analysis confounds the relationship in Figure 2. Table 1 reports the results of a linear probability model of the following specification:

$$Employed_i = \beta_1 MaxEITC_i + \beta_2 State\ Unemp_i + \beta_3 MaxEITC * State\ Unemp + \gamma X_i + \varepsilon_i$$

Where $Employed_i$ equals one if the individual reported working at all in the previous year, $MaxEITC_i$ is the maximum EITC benefit individual i could have received in the same year given their family composition and $State\ Unemp$ is the state unemployment rate. X_i is a vector of observable characteristics including, at a minimum the number of children individual i has. Standard errors are clustered at the state level to control for correlation of employment at the state level. Columns one and two display results when using the entire sample of single women from 1980-1997. We truncate at 1997 here because there is little variation in EITC benefits after 1997 and other (currently) unobserved explanatory variables are changing significantly, for instance the switch from AFDC to TANF. This timeframe allows us to exploit changes in EITC benefit levels from the tax reform act of 1986 as well as the variation in EITC benefits through the early 1990s. The first two columns

4

report results for all single women. The second column contains controls for education and race. As expected, individuals with higher potential EITC benefits tend to be employed at higher rates. The higher the unemployment rate in an individuals state, the lower the probability that individual is working. Importantly, the interaction term is both negative and signifiant. The regressions suggest that an increase in EITC benefits increases the probability individuals work, but the effect diminishes with higher state unemployment. Column three restricts the sample to individuals with twelve or fewer years of education. Individuals in this sample are more likely to have lower potential earnings, and therefor exhibit a higher probability of EITC eligibility. Notice that the coefficients on EITC, state unemployment and the interaction term all remain significant and in the direction predicted by theory. Column four, on the other hand, contains estimates generated from a sample of single women with at least 16 years of education. These women are likely to have at least a bachelors degree and therefore a higher potential wage. An individual in this sample is less likely to be eligible for EITC benefits. Indeed, we find that the coefficient on EITC benefits, and the interaction term are no longer significant. It also appears that higher educated single mothers are more insulated from cyclical employment fluctuations as evidenced by the insignificant coefficient on state unemployment.

3 Proposed Research

In his 2002 paper, Saez derives optimal tax schedules that depend on the intensive and extensive elasticities of labor supply. Related work shows that welfare gains from changes to the tax schedule also depend on these elasticities (Eissa, Kleven and Kreiner 2008). Our preliminary evidence suggests a variable extensive labor elasticities across labor market conditions, which supports a flexible tax and transfer schedule. Specifically, since the extensive elasticity appears to decline during times of high unemployment, the optimal tax schedule should shift some resources from transfers conditional on work to an unconditional transfer, assuming the intensive elasticity changes little. However one cannot estimate the degree to which

the tax schedule should change without estimating the magnitude of the elasticities. The regressions in table 1 shed light on $\frac{\partial Pr(Employed)}{\partial maxEITC}$, how the probability of employment changes with EITC benefits. However, the relevant extensive elasticity for optimal tax schedules is $\frac{\partial Pr(Employed_i)}{\partial(w_i-w_0)}\frac{w_i-w_o}{Pr(Employed_i)}$ where w_i is the potential income net of taxes and transfers if individual i works and w_0 is the net of transfer income to individual i if they do not work. Furthermore, the intensive elasticity, $\frac{\partial HoursWorked}{\partial MarginalRate}\frac{MarginalRate}{HoursWorked}$ depends on the marginal tax rate. While the CPS contains information on pre-tax wage earnings and hours worked, it does not contain information on the marginal tax rate of wage earners nor the value tax liability (or transfer) regardless of work status.

To estimate the intensive and extensive elasticities, we propose using a tax and benefit calculator to estimate post-tax and transfer earnings (w_i for each i) and the value of individual i's outside option of not working (w_0). Models such as the Urban Institute's TRIM3 are capable of this type of calculation. Related work routinely make use of tax and transfer calculators (see Eissa and Hoynes, 2006 or Eissa, Kelven and Kreiner, 2008 for example).

The estimation could be done in one of two ways: at the observational level of the CPS data, or by creating representative agents. First, we would like to consider each observation in our CPS data set and calculate the net value of the benefits and tax liability that each individual is eligible for given their level of earnings, number of children, state of residence, and so forth. Then we would like to re-evaluate the benefit levels and tax liabilities for a series of hypothetical earnings, while holding all other observed characteristics constant. For each observation we would like to calculate the value of benefits at all income levels, perhaps in \$100 increments. Alternatively, we could hold hourly wages constant and vary the number of hours worked. From these estimates, the goal is to construct menu of post-tax-and-transfer income levels the individual could choose from if she could precisely choose her pre-tax earnings level.

Second, we would like to run similar simulations for a set of representative agents instead of individual CPS observations. An example representative agent might be a single mother

6

of two in Wisconsin in 1997. We could fabricate a data set in which each observation is a representative individual and fill in all of the requisite variables for a tax and benefit calculator. The resulting output would give us after-tax-and-transfer income at the given pre-tax earnings level. Then we could re-run the simulation across all levels of pre-tax earnings. Aggregating and plotting the pre-tax earnings, post-tax income estimate pairs from the from the benefit calculator would result in a unique budget set for each of the representative individuals. Each of the the individuals in our CPS sample could then be mapped to the representative agent's budget set that most closely resembles the observable characteristics of the CPS individual.

Hypothetical potential wages for those who report not working could be imputed using a Heckman selection model. For those that do report earnings, we will have an estimate for their income if they choose not to work, w_0, from the tax-benefit calculator as well. Then a regression of the form

$$log(Pr(Employed)) = \alpha_1 log(w_i - w_0) + \alpha_2 StateUnemp + \alpha_3 log(w_i - w_0) * StateUnemp + \gamma X_i + \varepsilon_i$$

yields and estimate of the extensive elasticity of labor supply. While a regression of the form

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\begin{aligned}
log(HoursWorked) \;=\;& \beta_1 log(MarginalRate) + \beta_2 StateUnemp \\
& + \beta_3 log(MarginalRate) * StateUnemp + \gamma X_i + \varepsilon_i
\end{aligned}
$$

yields and estimate of the intensive elasticity of labor supply. Estimates for α_3 and β_3 will describe the degree to which the elasticities change across the business cycle. From these estimates we can calculate the degree to which the optimal tax and transfer schedule should change as labor market conditions evolve through business cycles.

4 Conclusion

Recent changes in the tax code and welfare legislation shifted a substantial amount of transfers from non-working individuals to low income individuals. The resulting negative effective marginal tax rates create work incentives that have been shown to be welfare improving in some settings, specifically when the labor supply elasticity along the participation margin is large relative to the intensive elasticity. When unemployment is high it may be more difficult for non-working individuals to respond to work incentives compared to a low unemployment environment. We propose a study of the intensive and extensive elasticities across cyclical changes in the labor market. Our results could provide insight regarding how responsive a tax and transfer schedule should be labor market conditions.

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Table 1: The Effect of the Earned Income Tax Credit on the Probability of Working (1980-1997)

Dependent Variable: Worked in Previous Year	(1) All	(2) All	(3) HS or Less	(4) Bachelor or More
Maximum EITC in 1000 Real USD	0.063 (0.0087)**	0.046 (0.0077)**	0.039 (0.0098)**	0.0059 (0.0060)
State unemployment rate	-0.0089 (0.0015)**	-0.0062 (0.0012)**	-0.012 (0.0020)**	-0.00075 (0.00052)
EITC Max*State Unemployment	-0.0080 (0.0015)**	-0.0057 (0.0013)**	-0.0043 (0.0016)**	-0.00024 (0.0010)
1 Child	-0.14 (0.015)**	-0.069 (0.011)**	-0.077 (0.013)**	-0.019 (0.0092)*
2 Children	-0.22 (0.020)**	-0.12 (0.014)**	-0.13 (0.015)**	-0.030 (0.011)**
3+ Children	-0.38 (0.026)**	-0.21 (0.017)**	-0.21 (0.014)**	-0.073 (0.017)**
Other Income (1000s)		-0.011 (0.00062)**	-0.028 (0.0022)**	-0.0024 (0.00037)**
HS Dropout		-0.22 (0.0092)**	-0.20 (0.0073)**	
Some College		0.072 (0.0037)**		
Bachelors Degree		0.079 (0.0041)**		
Post Bachelors (edu $\geq$ 16)		0.073 (0.0040)**		0.0040 (0.0019)*
Non-white		-0.090 (0.0063)**	-0.13 (0.0078)**	-0.024 (0.0035)**
Hispanic		-0.063 (0.021)**	-0.090 (0.025)**	-0.022 (0.0041)**
Constant	1.38 (0.093)**	1.81 (0.090)**	2.22 (0.13)**	0.90 (0.11)**
Observations	180802	180802	91134	34527
R^2	0.100	0.215	0.208	0.022

Standard errors clustered at the state level (* P<.05, ** P<.01).
Year fixed effects are included in all specifications. Maximum EITC benefit data is from the Tax Policy center. EITC benefit levels depend on the number of children in the household, income and vary across years. EITC data is lagged one year to match the employment data. The dependent variable equals one if reported weeks worked last year is greater than zero.

Figure 1: Maximum EITC benefits
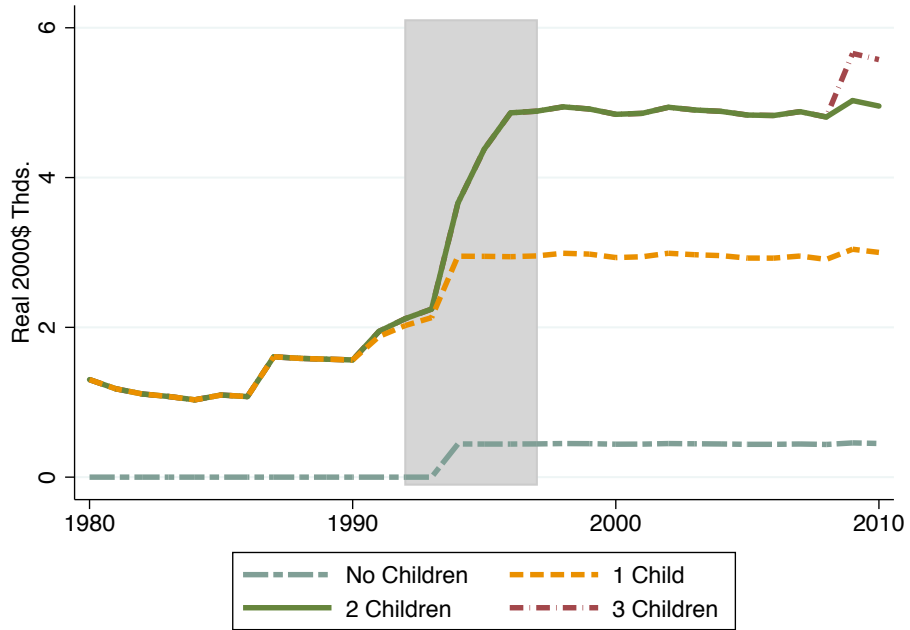
Notes: EITC benefit data are from the Tax Policy Center.

Figure 2: Rates of Employment: Single Mothers
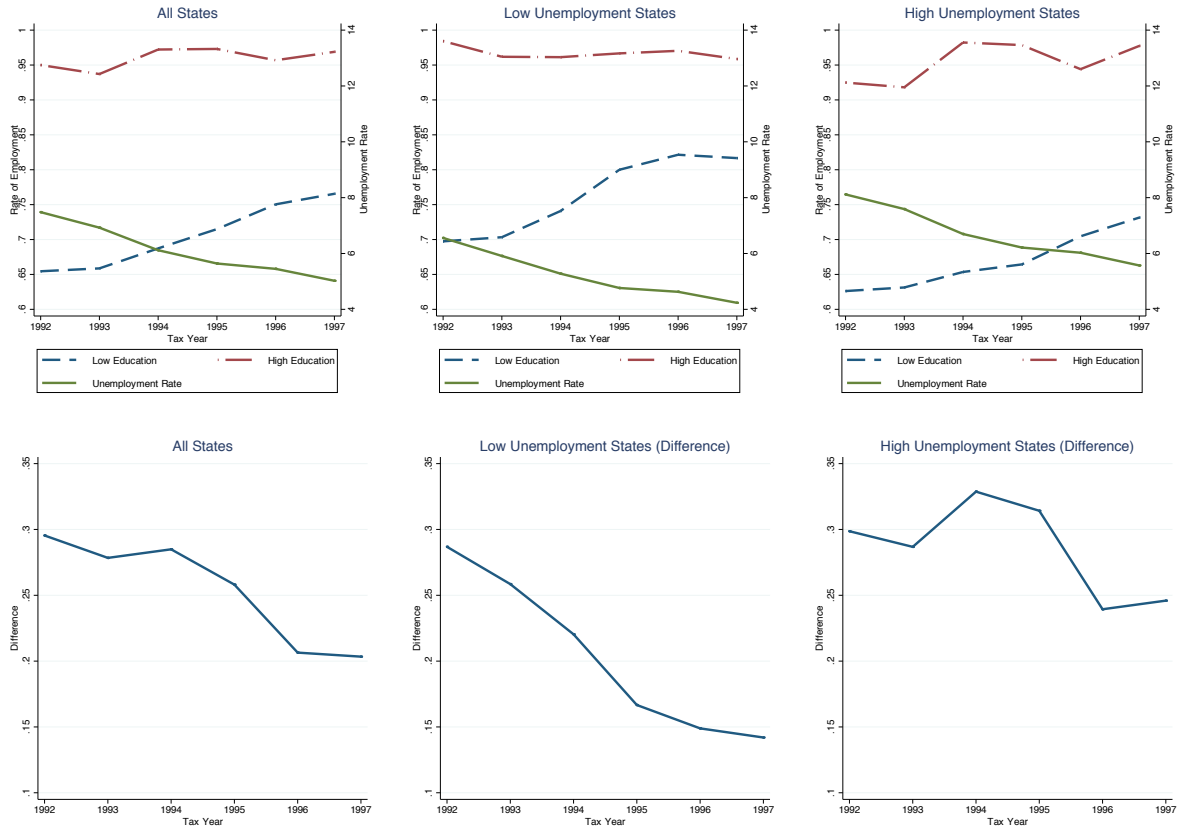
Notes: The time frame corresponds tot he grey area in Figure 1. Low education is defined as twelve or fewer years of schooling. High education is defined as 16 or more years of schooling. The unemployment rate is the average state unemployment rate in the sample.