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Do taxes, minimum wage laws, social insurance policies, and transfer programs affect rural and urban income distributions differently? Is income distributed less equally in urban than in rural areas? Are rural and urban income distributions evolving similarly? Asking these questions may appear pointless if the answers vary with the measure of equity used. However, we find that the Gini and the other well-known inequality or welfare measures give the same qualitative answers to these questions.[1]

Using data from 1981 to 1997, we show that these government policies have qualitative similar but quantitatively different effects on rural and urban areas; marginal income tax rates and the Earned Income Tax Credit play a more important role in equalizing income than do the other government programs in both areas; and income inequality measures for rural and urban areas have recently diverged.

We examine the effects of eight major government policies on welfare using the Atkinson welfare index as well three traditional welfare measures: the Gini index, coefficient of variation of income, and the relative mean deviation of income. In addition to examining the effect on welfare of government policy variables, we determine how changes in macro conditions and demographic variables over time and across the states affect welfare.

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[1] Dalton (1920) suggested that all common welfare measures would give the same rankings (level) across countries "in most practical cases." However, Atkinson (1970) demonstrated that they can give different rankings. Our claim is different. We show that changes in government policies (and macroeconomic and aggregate demographic variables) change the rankings of almost all measures in the same direction.

Strangely, most previous studies have considered the effect of only a single policy, ignoring the influences of other government policies, market conditions, and demographics. As Freeman (1996) observes, "Because the benefits and costs of the minimum (wage)/other redistributive policies depend on the conditions of the labor market and the operation of the social welfare system, the same assessment calculus can yield different results in different settings." Moreover, most previous studies of government programs do not take the next step of using a welfare measure to ascertain whether the program makes the income distribution more or less equal. Rather than focus on only the income effects on low-paid workers as do several of these studies, we examine the policy effects on the entire income distribution.

In this study, we focus on policy effects on pre-tax and post-tax income inequality in urban and rural areas[2]. According to Whitener, Weber and Duncan (2001), although the impact of the recent welfare reform does not appear to differ greatly between rural and urban areas at the national level, some studies on individual states report that the impact of welfare reform on employment and earnings in the rural areas is smaller than in the urban areas.[3] Instead of studying a single state, we systematically examine the impacts of tax and welfare programs on family income distribution across all states for each year from 1981 through 1997.

We find that the government policies have qualitative similar but quantitatively different impacts on the income inequality in rural and urban areas. In rural areas, taxes have smaller equalizing effects and government welfare and transfer programs have larger equalizing effects. These differential policy effects may be due to two main differences in the composition of the

[2] Wu, Perloff and Golan (2002) study the effects of government policies on aggregate U.S. income distribution.

[3] Rural Welfare Reform Research Panel, *Welfare Reform in Rural America: A Review of Current Research* provides state level welfare reform case studies.

population in these two areas. First, the proportion of the population that needs to pay income tax and the proportion in the top tax bracket are higher in urban areas. Second, a larger proportion of the rural population is eligible for welfare and government transfer program (such as the low-income families and the elderly).

In the next section we describe the data and the different government policies we analyze. The inequality measures are discussed in Section 3. The trends in inequality are discussed in Section 4. Section 5 describes the estimation results and provides a detailed comparison of the rural and urban areas. We draw conclusions in Section 6.

The Data

We construct a cross-section, time-series data set for the 50 U.S. states from 1981 through 1997.[4] Our source of data for income and the non-policy variables is the annual Current Population Survey (CPS) March Supplements. The March CPS for a given year contains labor market and income information for the previous year on between 50,000 and 62,000 households.

Our unit of observation is a rural or urban area within a state for each year. In some of the earlier years of our sample, the CPS covered only an urban or a rural area for some of the smaller states. Consequently, we have 796 observations for the urban areas and 718 observations for the rural areas.

The CPS total income measure, which is "the amount of money income received in the preceding calendar year", includes in-cash government transfers but not food stamps, other government in-kind transfers, income tax payments or tax credit received. Therefore, the CPS definition of income does not measure a family's entire disposable income.

[4] We cannot include more recent years because we do not have a consistent and reliable set of the explanatory policy variables.

Fortunately, beginning in the first year of our sample, 1981, the CPS imputed the value of government transfers, tax liability and credit for each family. The Census Bureau combined data from the American Housing Survey (AHS), the Income Survey Development Program (ISDP), and the Internal Revenue Service (IRS) with CPS data to simulate the taxes paid, number of tax filing units, adjusted gross income, and other tax characteristics for the March CPS.[5] By using this augmented series, we are able to construct the after-transfer, after-tax monetary income by adding the value of food stamps, tax payments or credit of each family to the corresponding CPS income. To control for family income variation due to family size, we divide the family income by the total number of family members to obtain a per person measure of income.

Government Policies

All the government policy variables vary over time and across states except the federal income tax and disability insurance variables, which vary only over time. For detailed information on Government policies during this period, see Meyer and Rosenbaum (2001) and Wu, Perloff, and Golan (2002).

We use two variables, the federal marginal income tax rate for the top bracket (High Tax) and for the bottom bracket (Low Tax), to proxy the change of federal income tax over the observed period. The state-specific data on the minimum wage and maximum weekly unemployment insurance benefits are from the U.S. Bureau of Labor Statistics' *Monthly Labor Review*, which summarizes the previous year's state labor legislation.

Data on other public assistance programs are from the annual *Background Material and Data on Major Programs within the Jurisdiction of the Committee on Ways and Means* (the

[5] For details, see "Measuring the Effect of Benefits and Taxes on Income and Poverty: 1979 to 1991," Current Population Reports Series P-60, No. 182. This series was not included in the official CPS March Supplement until 1992. The data for the earlier years were obtained from Unicon Research Corporation (*http://www.unicon.com*), to whom we are very grateful.

"Green Book"). Our minimum wage variable is the larger of the federal or the relevant state minimum wage. If the minimum wage changed during the year, we use a time-weighted average. Our Unemployment Insurance variable is the maximum weekly benefit in a state (almost all the states set the maximum coverage period at 26 weeks during the relevant period). Our disability (the inability to engage in "substantial gainful activity") insurance measure is the annual benefit. The Supplement Security Income (SSI) variable is the maximum monthly benefits for individuals living independently. To qualify for SSI payment, a person must meet age, blindness or other disability standard and have an income below the federal maximum monthly SSI benefit.

The AFDC variable is the maximum monthly benefits for a single-parent, three-person family. The "AFDC need standard" variable is the maximum income a single-parent, three-person family can have and still be eligible for assistance. The AFDC need eligibility standard is used for the food stamps program as well. Our food stamps variable is the dollar value of the maximum monthly benefit.

The Earned Income Tax Credit (EITC) program is an earning subsidy for the low income working families. To receive an EITC, a family must have reported a positive earned income. The EITC maximum benefit is determined by two factors: the EITC credit rate and the minimum income requirement for maximum benefit. Our EITC Benefits variable measures the maximum benefit, which is the product of these two factors. The EITC is phased out as a family's income rises. For example, in 1997, the phase-out income range was ($11,930, $25,750) for a one-child family. The credit is reduced by 15.98¢ for each extra dollar earned above $11,930 so that the benefit drops to zero at $25,750. Here, our EITC phase-out rate variable measures the rate, 15.98%, at which the EITC benefits is reduced over the phase-out range. Beginning in middle

1980's, some states offered their own state EITC, usually in the form of a fixed percent of the federal EITC credit. Our EITC benefit variable is adjusted by state supplements; hence this measure varies across both states and time.

Macroeconomic and Demographic Variables

We include two macroeconomic variables to control for economic conditions. The gross domestic product (GDP) and state unemployment rates are from the Bureau of Labor Statistics' website. In addition to state dummy variables, we include annual state-level demographic characteristics obtained from the CPS: the percentage of the population with a high school degree, the percentage of the population with at least a college degree, the percentage of female-headed families, the percentage of the state's population in various age groups (younger than 18, 18-29, the residual group, and older than 59), and the average family size.

Table 1 contains the summary statistics for the sample. Compared to the urban population, the rural population has a lower average education level, a smaller fraction of female-headed families, a larger average family size, and a larger proportion of elderly people.

Inequality Measures

We use the three traditional inequality measures as well as the Atkinson index. In defining our welfare measures, we let y reflect income normalized by the sample mean, y^* is the highest observed income, $f(y)$ is the density of income, $F(y)$ is the income distribution, μ is the empirical mean income, V is the standard deviation of y, and $\phi(y) = \int_0^y zf(z)\,dz$ is the Lorenz function. The three traditional welfare measures are:

- the coefficient of variation of income (COV): V/μ;
- the relative mean deviation of income (RMD): $\int_0^{y^*} |y-1| f(y)\,dy$;

- the Gini index: $\frac{1}{2}\int_0^{y^*}\left[yF(y)-\phi(y)\right]f(y)\mathrm{d}y$.

One might choose between these measures based on how they treat transfers between individuals. Dalton (1920) argued that any ranking of distributions should satisfy his "principle of transfers" whereby a transfer of income from a richer person to a poorer person leads to a preferred distribution. Given Dalton's criterion, we would reject any measure that is not strictly concave such as the relative mean deviation, which is unaffected by transfers between people on the same side of the mean. The other two traditional measures are sensitive to transfers at all income levels. The coefficient of variation attaches equal weight to transfers anywhere in the distribution. The Gini index attaches more weight to transfers at the middle of the distribution than in the tails for typical distributions (Atkinson, 1970). Atkinson shows that Dalton's concept is the same as that of a mean preserving spread. Atkinson notes that all these measures (and any other concave social welfare function) give the same ranking when comparing two distributions where one is a mean preserving spread of the other. However, these measures may give different rankings if the mean preserving spread condition is not met.

Atkinson (1970) popularized a welfare measure that we refer to as the "Atkinson index." This index has three strengths. First, the Atkinson index uses a single parameter to nest an entire family of welfare measures that range from very egalitarian to completely nonegalitarian. Second, it can be derived axiomatically from several desirable properties (Atkinson 1970; Cowell and Kuga 1981). As Dalton (1920) and Atkinson (1970) argued compellingly, a measure of inequality should be premised on a social welfare concept. They contended that a social welfare function should be additively separable and symmetric function of individual incomes. Atkinson imposed constant (relative) inequality aversion.

Third, the Atkinson index has a useful monetary interpretation. Corresponding to the Atkinson index is an equally distributed equivalent level of income, y_{EDE}, which is the level of income per head that, if income were equally distributed, would give the same level of social welfare as the actual income distribution:

$$U\left(y_{EDE}\right)\int_0^{\bar{y}} f\left(y\right)dy = \int_0^{\bar{y}} U\left(y\right) f\left(y\right)dy\,,$$

where $U(y)$ is an individual's utility function. This measure is invariant to linear transformations of the utility function. Atkinson's welfare index is

$$I = 1 - \frac{y_{EDE}}{\mu}\,, \tag{1}$$

where μ is the actual average income. We can use this index to determine the percentage welfare loss from inequality. For example, if $I = 0.1$, society could achieve the same level of social welfare with only 90% of the total income if incomes were equally distributed. Our measure of welfare loss from inequality, L, is the difference between the actual average income and the equally distributed equivalent level,

$$L = \mu - y_{EDE} \tag{2}$$

is a transformation of the Atkinson welfare index, Equation (1).

To impose constant relative inequality-aversion, Atkinson chose the representative utility function

$$U\left(y\right) = \begin{cases} A + B\dfrac{y^{1-\varepsilon}}{1-\varepsilon} & \varepsilon \neq 1 \\ \ln\left(y\right) & \varepsilon = 1 \end{cases}$$

where $\varepsilon \geq 0$ for concavity and ε represents the degree of inequality aversion. After some algebraic manipulations involving Equations (1) and (2), Atkinson obtained his welfare index for *n* people:[6]

$$I_\varepsilon = \begin{cases} 1 - \left(\frac{1}{n} \sum_{i=1}^{n} \left(\frac{y_i}{\mu} \right)^{1-\varepsilon} \right)^{\frac{1}{1-\varepsilon}} & \varepsilon \neq 1 \\ 1 - \left(\prod_{i=1}^{n} \frac{y_i}{\mu} \right)^{\frac{1}{n}} & \varepsilon = 1 \end{cases} . \qquad (3)$$

Atkinson's index, Equation (3), equals zero when incomes are equally distributed and converges to (but never reaches) 1 as inequality increases. The index rises with ε. The larger is ε, the more weight the index attaches to transfers at the low end of the distribution and the less weight to transfers at the high end of the distribution. In the extreme case where $\varepsilon \to \infty$, the welfare measure becomes Rawlsian: Welfare depends on the income of the poorest member of society. If ε = 0, the utility function is linear in income and the distribution of income does not affect the welfare index: $I_\varepsilon = 0$ for any income vector. Thus, we view ε = 0 as a degenerate case and only look at ε that are strictly positive. In his empirical work, Atkinson suggests that we might all agree that $1.5 \leq \varepsilon \leq 2.0$. We examine $0 < \varepsilon \leq 2.0$.

In our sample, the correlations between the inequality rankings from Atkinson indexes with ε in the range (0, 1] and the relative mean deviation, the coefficient of variation, and the

[6] Atkinson's welfare function is of the form of the generalized entropy measure in Tsallis (1988). In the limit as $\varepsilon \to 1$, this generalized entropy measure collapses to the standard Shannon entropy measure or Theil's measure of welfare.

Gini index are virtually one.[7] Therefore, by choosing an appropriate value of ε, we could use I_ε to proxy the inequality ranking from the traditional inequality indexes. Nonetheless, we report these traditional welfare measures in our analyses because of their familiarity.

Trends in Inequality

Income inequality as measured by each of the inequality measures rose substantially during the sample period. However, the evolution of rural and urban inequality in individual states varies substantially. For example, for a given state that has data for both rural and urban areas in a given year, the correlation between the rural and urban Gini indexes is only 0.45 using pre-tax income and 0.46 using post-tax income.

To save space, we discuss only the Gini index for both rural and urban areas, though all measures show similar patterns. The left panel of Figure 1 plots the Gini indexes of pre-tax income for the urban (solid) and rural (dashed) areas from 1981 through 1997. The urban Gini inequality index is higher (less equal) in each year than the rural urban inequality and increases by more over the sample period. Rural inequality increases from 0.398 to 0.430, while urban inequality increases from 0.406 to 0.464. The Gini indexes move together in the beginning of the period and thereafter diverge. In both areas, inequality increases between 1981 and 1984, and then declines slightly in the subsequent two or three years. Starting in 1988, urban inequality began to rise quickly while rural inequality remained stable for another two more years and then declined slightly between 1990 and 1992. Starting in 1994, both measures grew very rapidly for a couple of years and then leveled off between 1996 and 1997.

[7] We also examined other inequality measures, such as the standard deviation of the logarithm of income, $\int_0^{y^*} \left[\log(y)\right]^2 f(y)\,dy$, but do not include here to save space. The standard deviation of the logarithm is almost perfectly correlated with $I_{1.5}$.

The right panel of Figure 1 shows the Gini indexes of post-tax income for both areas. The post-tax Gini inequality measures are considerably smaller than the pre-tax measures: The Gini is 0.042 lower for the urban area on average and 0.040 for the rural area. As with the pre-tax indexes, the post-tax Gini indexes are nearly equal in the two areas from 1981 through 1984. Thereafter, the rural and urban indexes diverge: The urban income distribution became much more unequal than the rural one.

We can calculate the value of the welfare loss using the Atkinson index. For example, the Atkinson index of pre-tax income with $\varepsilon = 1$ is 0.270 for urban areas and 0.261 for rural areas in 1981. Using Equation (2), the corresponding annual welfare losses due to inequality are \$1,912 and \$1,521 per person. The same Atkinson index with $\varepsilon = 1$ increased to 0.340 for urban areas and 0.297 for rural areas by the end of the sample in 1997. The welfare losses (in 1981 dollars) increased to \$2,768 and \$1,924 respectively, 34.0% of urban and 29.7% of rural average income.

Wu and Perloff (2003) formally analyze these trends. Here, however, we are interested in the factors that affect inequality.

Regression Analysis

We use regressions to show how government policies and macro conditions contributed to these changes in income inequality in rural and urban areas. We include in our model all the major government programs that directly or indirectly transfer income to low-income families. The government tax and transfer programs directly affect family income. The minimum wage, disability insurance, and unemployment insurance have direct effects on people's received income and indirect effects on their transferred income because other government transfer programs are contingent on earned income.

These direct and indirect effects of the different policies were noted by Ashenfelter (1983). He described government policies as having "mechanical" and "behavioral" effects. The policies' mechanical effects are the benefits (income) provided by each tax or transfer program. These mechanical effects cause the post-tax income to differ from the pre-tax income. The policies also have behavioral effects: people may respond to changes in these programs by changing their participation decision, hours of work, or other labor market decisions (see, for example, Hausman, 1981, for the labor supply effects of tax and Moffitt, 1992, for the incentive effects of welfare programs). Behavioral responses alter both pre- and post-tax income distributions.

We estimate cross-sectional, time-series regression models with first-order autoregressive error terms:

$$w_{it} = a + \mathbf{X}_{it}\boldsymbol{\beta} + u_i + e_{it},$$

where

$$e_{it} = \rho e_{it-1} + z_{it},$$

w_{it} is the inequality or welfare index for either the urban or rural area, $\mathbf{X}_{it}$ is a vector of the explanatory variables, the subscript i indexes the states, t indexes the year, $|\rho| < 1$, and z_{it} is independent and identically distributed (IID) with zero mean and variance σ_z. We estimate a random-effect model in which the state effects are captured by u_i, realization of an IID process with zero mean and variance σ_u.[8] Due to the unbalanced panel structure of our data, we use the methods derived in Baltagi and Wu (1999).

[8] The CPS does not cover both rural and urban areas for the entire sample period. For certain states we have only 3 observations for rural areas over the 17 years of our sample. Consequently, we use a random-effect model rather than a fixed-effect model, which have short panel lengths for some states. As a check, we also estimated a fixed-effect model and found that the results are very close to those of our preferred random-effects models.

The explanatory variables included in **X** are the percentage of the population finishing high school and finishing college; the percentage of female-headed families; average family size; the percentage of the population under age 18, between 18 and 29, and than 59; the marginal income tax rates for the lowest and the highest tax bracket; the EITC benefit and phase-out rate; the minimum wage; the UI benefit; the SSI benefit; the disability insurance benefit; the AFDC benefit and need standard; the food stamps benefit; the GDP; and the unemployment rate.

We estimate the model using all the measures of inequality: the three traditional inequality measures and the Atkinson index for a wide range of values of the "inequality aversion" parameter ε. We report the Atkinson measure for ε equal 0.5, 1, and 2, which are social welfare functions with relatively low-, medium- and high-degrees of inequality aversion. The results for other inequality indices (the deviation in logarithms and Atkinson indexes for other values of ε) are qualitatively similar to these.

Although the policy effects are qualitatively similar in the two areas, we can use Chow tests to reject the hypothesis that the two sets of regression coefficients are equal. For each inequality measure, the restriction is rejected decisively (the p-values are essentially equal zero). Therefore, we expect the policies and macro variables to have quantitatively different effects across the two areas.

Because the pattern of urban and rural inequality started to diverge in 1990, we test the hypothesis of systematic changes in the policy effects in 1990. We cannot reject the null hypothesis of no structural break using a likelihood ratio test in which we compare the pooled regression to separate regressions for the period up to 1989 and from 1990 on. Similarly, we cannot reject the hypothesis of no structural break in 1995.

The Urban Areas

Tables 2 and 3 report the regression results for pre-tax and post-tax income inequality for the urban area. The coefficients are qualitatively similar across all the inequality measures for both pre-tax and post-tax income. The estimated auto-correlation coefficients are less than 0.3, indicating modest auto-correlation of income inequality. The share of the variation that is due to the random state effects, u_i, is around one third to one half, depending on the dependent variable. The R^2's range from 0.27 through 0.43**.** On the average, about 45% of the variation explained by the model is due to the policy variables for both pre-tax and post-tax inequality. For example, the R^2 of the pre-tax Gini regression is 0.39, of which 44% of the explained variation is attributed to the policy variables. The R^2 for the post-tax Gini is 0.38, and 46% of the variation explained by the model is due to the policy variables.

Most of the government policy variables have the expected signs. However, the results for the top tax rate may be surprising. As expected, an increase in the marginal income tax rate for the lowest tax bracket (which is correlated with intermediate bracket tax rates) has an equalizing effect on both pre-tax and post-tax income that is statistically significantly different than zero at the 0.05 level in all the post-tax regressions and most of the pre-tax ones. In contrast, the marginal income tax rate for the top tax bracket only has statistically significant equalizing effects for the post-tax income, as indicated by the Gini index and the Atkinson index with $\varepsilon = 0.5$ and 1.

As we expected, the EITC benefit—which only low-income, working families receive—does not statistically significantly affect pre-tax income but does statistically significantly affect the post-tax income inequality for all the reported inequality measures except for the coefficient of variation of income and I_2. This finding is consistent with the literature that the EITC plays an

important role in increasing the income of the working poor and reduces income inequality (Neumark and Washer 2001, and Wu, Perloff, and Golan 2002).

Because EITC recipients tend to be low-income families whose primary source of income is earnings, the EITC phase-out rate may have a disequalizing effect because it induces some of these families to decrease their labor supply and earnings.[9] Eissa and Hoynes (1998) and Wu (2003) found that the EITC phase-out rate has substantial disincentive effects on the labor supply of the affected population, and therefore may reduce their pre-tax and post-tax income. In most of our regressions, the EITC phase-out variable statistically significantly raises inequality for both pre-tax and post-tax income distributions.

Although an increase in minimum wage raises the wage floor, individuals who were previously earning a wage between the lower old, and higher new minimum wage rate may lose their jobs or be forced to reduce their hours because of the unemployment effects of the minimum wage. Moreover, the minimum wage is not a means-tested program. Unlike the welfare and other government transfer programs, all workers are entitled to earn at least the minimum wage. Burkhauser, Couch, and Wittenburg (1996) observe that minimum wage workers are evenly distributed across all family income groups, in large part because many of them are teenagers workers from relatively well-off families. However, the disemployment effect is disproportionately concentrated among low-income families. Therefore, we expect that raising the minimum wage will raise inequality (Neumark, Schweitzer and Wascher, 1998 and Wu, Perloff and Golan, 2002). In our regression, an increase in our minimum wage variable, which is the higher of the federal and state minimum wages in each state in each year, raises both

[9] The EITC phase-out rate is the marginal tax rate at which the EITC benefit is taxed once the recipient's earnings exceeds a certain threshold.

pre-tax and post-tax income inequality (the effect is statistically significant for all inequality measures except I_2).

The disability insurance and AFDC program reduce both the pre-tax and post-tax income inequality (statistically significantly in most equations). Unlike tax payments and the EITC benefit, the value of AFDC is included in the CPS's pre-tax income measure. Therefore, we expect to see similar effects of the AFDC benefit variable on both pre-tax and post-tax income. The remaining policy variables—unemployment insurance, supplemental social insurance, the need standard for the AFDC program, and food stamps—do not have statistically significant effects on pre-tax or post-tax income inequality.

Some of the demographic characteristics have statistically significant effects on inequality. Consistent with the literature, we find that a rise in the share of female-headed families plays an important role in increasing income inequality. For both the pre-tax and post-tax income distribution, the percentage of female-headed family shows the most statistically significant effects among all the explanatory variables. States with a high proportion of large families have less equal income distributions. States with a large share of families with heads who are younger than 18 tend to have less equal incomes. However, age of the family head does not otherwise have statistically significantly effects on inequality.

The larger the percentage of the population with a high school education, the less income inequality (though this effect is statistically significant in only some of the regressions). A larger percentage of college graduates makes the income distribution less equal (statistically significantly in most equations). These finding are consistent with the literature: The wage/income premium for college graduates compared to low-skilled workers has been

increasing during the last two decades, partially due to the shift in labor demand away from unskilled workers.

A rise in GDP leads to greater income inequality. Surprisingly, shifts in the unemployment rate have little effect.

The Rural Areas

Table 4 and 5 report the corresponding results for rural areas. The regression results on the rural area are similar to the urban ones across the various inequality measures for both the pre-tax and post-tax income distributions. The autocorrelation coefficients, ρ, lie between 0.12 to 0.23. The share of the residual that is attributed to the random state effects is between one-fifth to slightly over one-third. The R^2's range from 0.17 through 0.4**.** On the average, about 40% of the variation explained by the model is due to the policy variables for both pre-tax and post-tax inequality. For example, the R^2 of the pre-tax Gini regression is 0.38, of which 39% of the explained variation is due to the policy variables. The R^2 for post-tax Gini is 0.36, and 42% of the variation explained by the model is due to the policy variables.

The statistically significant qualitative government policy effects are similar to those in the urban areas. The marginal income tax rate for the lowest tax bracket has a statistically significant equalizing effect on both the pre-tax and post-tax income distributions, while the tax rate for the highest income bracket does not have a statistically significant effect.

For most of the inequality measures for both pre-tax and post-tax income, a larger EITC benefit decreases the income inequality while its phase-out rate increases inequality. The minimum wage variable has little effect. Of the remaining government policy variables, only the AFDC/TANF benefits have a statistically significant (equalizing) effect on the income distribution.

The demographic and macro economic indicator variables generally have the same qualitative effects as in the urban areas. The income inequality decreases as the share of the population that finished high school increases or as the share of college graduates decreases. The percentage of female-head families has statistically significantly increases inequality. The average family size has little effect. Again, inequality is greater, the larger the share of families headed by people younger than 18. However, age otherwise has little effect. Finally, income inequality increases with the GDP, but does not appear to respond to changes in unemployment rate.

Urban and Rural Comparison

To see how the variables with statistically significant effects—marginal income tax rates, EITC variables, the minimum wage, and GDP—affect various measures of inequality, we first calculate the elasticities of inequality for each variable evaluated at the sample averages. Next, we calculate the dollar value of the welfare effects.

Elasticities

Table 6 reports the estimated urban elasticities, and Table 7 lists the rural elasticities. For example, the last cell in the first column of numbers (post-tax panel) of Table 6 shows that that the post-tax, urban Gini elasticity with respect to GDP is 0.34. Thus, when GDP rises by 1 percent, the urban Gini increases by 0.34 percent. In both tables, the post-tax elasticity is almost always larger in absolute value than is the pre-tax elasticity (and more likely to be statistically significantly different from zero).

Increasing the marginal rate on the bottom bracket, Low Tax, or the rate on the top bracket, High Tax, tends to reduce inequality in both areas. Low Tax has statistically significant effects (except for the coefficient of variation of income measure) on both pre- and post-tax

inequality in urban and rural areas. The effects in rural areas are slightly larger in absolute value. In urban areas, High Tax does not have statistically significant effects on the pre-tax inequality, but does have statistically significant equalizing effects on the post-tax urban Gini, relative mean deviation of income, and $I_{0.5}$ inequality measures. The High Tax effects are not statistically significant in rural areas. One possible explanation for why High Tax has more of an effect in equalizing income in urban than in rural areas is that relatively few rural dwellers are in the top tax bracket.[10]

Transfer programs tend to have bigger effects in rural areas where relatively more families are eligible for government transfers because of low income or age. For the same reason as with taxes, the post-tax effects of government transfer programs are generally larger (in absolute value) than pre-tax effects.

The two EITC elasticities are considerably larger in rural than in urban areas, especially the ETIC benefit. The EITC benefit has a statistically significant effect on both pre- and post-tax inequality in rural areas (except for the coefficient of variation of income and I_2). In urban areas, the EITC benefit does not have a statistically significant effect on pre-tax inequality, but does have a statistically significant equalizing effect on the post-tax Gini, relative mean deviation of income, and the $I_{0.5}$ inequality measures. The EITC phase-out rate increases both pre-tax and post-tax inequality, with a larger effect in the rural areas.

One major difference between the urban and rural areas is that the minimum wage has large, statistically significant effects in urban areas, but does not have a statistically significant effect in the rural areas. A plausible explanation is that the minimum wage law is less likely to

[10] For example, in 1997, 44.3% of the tax filers in urban areas are in the lowest tax bracket while 1.2% of them are in the top tax bracket. For rural areas in the same year, the percentages are 50.7% and 0.5% respectively (in the CPS March files).

be enforced in rural areas. Moretti and Perloff (2000) find that many agriculture workers are paid less than the minimum wage (unlike most other workers). Because the minimum wage directly influences the earned income and does not involve any transfer from the government, the urban pre-tax and post-tax minimum wage effects are close. The post-tax effects are slightly smaller, possibly because losses in income due to an increase of minimum-wage induced unemployment may be mitigated by compensating government transfers.

Growth of the economy causes inequality to increase substantially. The effects are roughly equal in rural and urban areas for all the welfare measures. A 10 percent increase in GDP causes the pre- and post-tax Gini to rise by roughly 3 percent and I_1 to increase by 6 to 7 percent in all areas.

Magnitude of Policy Effects

We can also compare the magnitude of policy effects using the Atkinson measures' dollar value interpretation. (There is no simple way to compare the magnitude of the effects using traditional measures.) We illustrate the magnitude of the welfare effects of some key government policy and other variables in our analysis using the change in the welfare loss, $L = \mu - y_{EDE}$, Equation (2), which is the actual average income, μ, less the equally distributed equivalent level of income, y_{EDE}.

Our measure of a policy's welfare effect is a dollar value interpretation of change in the aggregate social welfare and depends on the choice of ε in the Atkinson index, which captures the degree of inequality aversion. This estimate is based on the distributions of individual realized income, which reflects the impact of policy changes on both the benefit calculation (the direct/mechanical effect) and the induced responses in labor market behavior (the indirect/behavioral effect). Therefore, the reported welfare benefit/cost should not be confused

with the traditional benefit/cost analysis, which does not take into account either the social welfare function or the potential behavior effects of changes in policies.

If we raise the 1997 level of the Low Tax rate by 10%, from 15% to 16.5%, the Atkinson index changes to $\hat{I}'_{\varepsilon} = \hat{I}_{\varepsilon} + 0.165 \times \widehat{\beta}_{\text{Low Tax}}$, where $\hat{I}_{\varepsilon}$ is the estimated actual Atkinson index for 1997 family income and $\widehat{\beta}_{\text{Low Tax}}$ is the estimated coefficient for the Low Tax. Assuming that the change in taxes does not have general equilibrium effects, the change in welfare loss from lack of equality is [using Equation (1)]

$$\Delta L = \left(\mu_{97} - \hat{y}_{EDE}\right) - \left(\mu_{97} - \hat{y}'_{EDE}\right) = \mu_{97}\left[\left(1-\hat{I}'_{\varepsilon}\right) - \left(1-\hat{I}_{\varepsilon}\right)\right] = \mu_{97}\left(\hat{I}_{\varepsilon} - \hat{I}'_{\varepsilon}\right)$$

where the urban μ_{97}, the arithmetic mean in 1997 dollars of per person income, is \$14,405, pre-tax, and \$11,458, post-tax, while the corresponding rural averages are \$12,878 and \$10,545.

Table 8 shows the average welfare losses (or gains) for $\varepsilon = 0.5$, 1, and 2. Across the ε's, the largest equalizing welfare effects are for a 10% increase in a policy is for the lowest tax rate. This welfare effect is larger than the direct effect from a 10% increase in AFDC/TANF payment. A 10% increase in the minimum wage has the greatest disequalizing effect in urban areas.

For $\varepsilon = 0.5$, a 10% increase in the minimum wage leads to an urban welfare loss of \$58 pretax and \$40 post-tax but has no effect on rural welfare. A 10% increase in the share of female headed households results in an urban welfare losses of \$64 pre-tax and \$44 post-tax, and corresponding rural losses of \$40 and \$25. A 10% increase in the Low Tax rate increases the average pretax welfare by \$22 in urban areas and \$17 in rural areas, and the corresponding post-tax welfare effects are \$19 and \$16.

Summary and Conclusions

This study is the first to investigate and compare the effects of all major income redistribution policies on inequality in the urban and rural areas using data from across the

United States. During the past two decades, income inequality has increased considerably in both rural and urban areas in response to changes in these policies and macro conditions.

We systematically examine the effects of income tax rates, the minimum wage, and all the major government welfare and transfer programs on family income inequality. We find that it is feasible to study welfare effects of policies because the qualitative results are generally the same across most major inequality measures.

Previous studies, based on data from individual States, suggest that (Whitener, et al. 2001, Kilkenny and Huffman 2003) the welfare reform may have relatively small effect on the labor supply and on other labor market behavior of the rural low income families. We find that these policy effects (on income inequality) are qualitatively, but not quantitatively, similar across rural and urban areas.

Further, we also examine the policy effects on the inequality level of both pre-tax and post-tax income distributions. The impacts of the policies involving income transfers between the government and the individuals, such as tax and the EITC programs, are larger for the post-tax income inequality. However, we also observe substantial changes in pre-tax inequality for some policies due to their incentive effects. For policies that do not involve direct transfers, such as the minimum wage, we observe comparable effects on pre-tax and post-tax income inequality.

Although government tax and transfer programs have similar qualitative effects in rural and urban areas, some policies are relatively more effective in reducing inequality in rural areas. Whereas adjusting the marginal tax rate on the lowest bracket or EITC benefits have as large or larger effects on equalizing income as in urban areas, the minimum wage only affects urban inequality, and macro policies that increase GDP have larger effects in urban than in rural areas.

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Table 1: Summary Statistics

Variable	*Unit*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
Low Tax	Percent	0.14	0.02	0.11	0.15
High Tax	Percent	0.41	0.10	0.28	0.69
EITC Benefits	$1,000/year	0.88	0.36	0.48	2.07
EITC Phase-out Rate	Percent	0.13	0.02	0.10	0.24
Minimum Wage	$/year	3.07	0.25	2.70	4.24
Unemployment Insurance	$1,000/week	0.19	0.08	0.06	0.72
SSI	$1,000/month	0.32	0.05	0.26	0.63
Disability Insurance	$1,000/year	0.31	0.04	0.24	0.38
AFDC/TANF	$1,000/year	0.29	0.12	0.08	0.68
AFDC/TANF Need Standard	$1,000	0.43	0.15	0.17	1.30
Food Stamps	$1,000/month	0.18	0.03	0.09	0.30
GDP	$1,000 billion	4.28	0.52	3.38	5.17
Unemployment Rate	Percent	0.07	0.01	0.05	0.10
Urban (796 observations)					
High School	Percent	0.70	0.19	0.24	0.93
College	Percent	0.17	0.07	0.03	0.41
Female-headed Family	Percent	0.21	0.03	0.11	0.35
Family Size	# of persons	3.24	0.21	2.74	4.15
Age <18	Percent	0.27	0.03	0.18	0.38
Age 18-29	Percent	0.19	0.03	0.11	0.30
Age >59	Percent	0.15	0.03	0.04	0.27
Rural (718 observations)					
High School	Percent	0.62	0.21	0.14	0.92
College	Percent	0.11	0.05	0.02	0.34
Female-headed Family	Percent	0.19	0.04	0.09	0.36
Family Size	# of persons	3.28	0.25	2.27	4.52
Age <18	Percent	0.28	0.03	0.16	0.40
Age 18-29	Percent	0.16	0.03	0.06	0.27
Age >59	Percent	0.19	0.04	0.05	0.37

Table 2: Regression Results Of Pre-Tax Inequality For The Urban Areas

Dependent	*Gini*		*RMD*		*COV*		$I_{0.5}$		I_1		I_2	
Variable	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*
High School	-0.032	-2.45	-0.055	-2.80	-0.064	-1.01	-0.021	-2.30	-0.036	-2.22	-0.051	-1.26
College	0.087	2.50	0.127	2.39	0.043	0.26	0.055	2.23	0.107	2.48	0.192	1.91
Female Head	0.264	8.11	0.370	7.52	0.747	4.92	0.205	8.95	0.432	10.77	0.906	9.48
Family Size	0.026	2.94	0.038	2.90	0.078	1.99	0.020	3.24	0.041	3.85	0.099	4.04
Age <18	0.178	2.59	0.251	2.40	0.430	1.33	0.122	2.50	0.212	2.48	0.117	0.58
Age 18-29	0.012	0.23	0.027	0.36	-0.191	-0.80	0.000	0.01	0.006	0.10	-0.073	-0.48
Age >59	0.072	1.35	0.097	1.20	0.050	0.20	0.045	1.19	0.086	1.31	0.055	0.35
Low Tax	-0.002	-2.15	-0.002	-1.78	-0.007	-1.85	-0.001	-2.25	-0.002	-2.41	-0.006	-2.33
High Tax	-0.021	-1.12	-0.019	-0.67	0.018	0.19	-0.016	-1.23	-0.038	-1.63	-0.075	-1.28
EITC Benefit	-0.011	-1.14	-0.017	-1.20	-0.046	-0.99	-0.009	-1.33	-0.014	-1.21	-0.010	-0.33
EITC Phase-out	0.265	2.22	0.404	2.23	1.618	2.79	0.195	2.31	0.210	1.42	-0.219	-0.59
Minimum Wage	0.018	3.07	0.024	2.75	0.105	3.73	0.013	3.22	0.019	2.60	0.022	1.26
Unemployment Ins.	-0.001	-0.06	-0.001	-0.06	0.031	0.61	0.001	0.18	0.005	0.38	0.056	1.68
SSI	-0.019	-0.47	-0.022	-0.37	0.081	0.50	-0.012	-0.45	-0.019	-0.39	0.074	0.75
Disability Ins.	-0.059	-2.63	-0.071	-2.12	-0.394	-3.47	-0.044	-2.77	-0.067	-2.42	-0.117	-1.58
AFDC/TANF	-0.057	-2.56	-0.082	-2.41	-0.294	-3.4	-0.044	-2.88	-0.077	-2.84	-0.140	-2.63
AFDC/TANF Need Std.	0.009	1.05	0.012	0.97	0.006	0.16	0.005	0.87	0.012	1.17	0.020	0.88
Food Stamps	0.026	0.42	0.031	0.33	-0.086	-0.33	0.021	0.47	0.088	1.15	0.403	2.49
GDP	0.033	4.34	0.051	4.50	0.154	4.00	0.024	4.46	0.039	4.13	0.059	2.36
Unemployment Rate	0.002	0.90	0.004	1.41	-0.004	-0.41	0.001	0.83	0.003	1.40	0.008	1.45
Constant	0.045	0.77	0.029	0.32	-0.445	-1.59	-0.123	-2.95	-0.199	-2.74	-0.240	-1.34
ρ	0.289		0.300		0.206		0.281		0.295		0.117	
σ_u	0.016		0.025		0.045		0.011		0.019		0.028	
σ_z	0.018		0.027		0.088		0.013		0.022		0.057	
R^2	0.395		0.373		0.406		0.429		0.431		0.271	

Table 3: Regression Results Of Post-Tax Inequality For The Urban Areas

Dependent	*Gini*		*RMD*		*COV*		$I_{0.5}$		I_1		I_2	
Variable	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*
High School	-0.022	-1.85	-0.039	-2.21	-0.036	-0.66	-0.013	-1.72	-0.022	-1.65	-0.029	-0.76
College	0.072	2.31	0.103	2.20	0.037	0.27	0.039	1.97	0.071	2.00	0.063	0.67
Female Head	0.232	7.99	0.328	7.52	0.568	4.39	0.159	8.59	0.343	10.27	0.846	9.47
Family Size	0.021	2.68	0.030	2.54	0.065	1.94	0.015	3.08	0.033	3.65	0.088	3.91
Age <18	0.173	2.81	0.254	2.74	0.455	1.65	0.092	2.35	0.135	1.90	-0.127	-0.67
Age 18-29	0.012	0.28	0.038	0.56	-0.128	-0.63	-0.003	-0.10	-0.008	-0.16	-0.153	-1.09
Age >59	0.049	1.02	0.077	1.08	0.035	0.17	0.023	0.75	0.037	0.68	-0.089	-0.61
Low Tax	-0.002	-2.99	-0.003	-2.61	-0.007	-2.05	-0.001	-3.11	-0.003	-3.42	-0.007	-3.11
High Tax	-0.038	-2.25	-0.046	-1.82	-0.036	-0.46	-0.023	-2.11	-0.044	-2.27	-0.060	-1.07
EITC Benefit	-0.018	-2.17	-0.028	-2.27	-0.054	-1.35	-0.012	-2.24	-0.022	-2.31	-0.047	-1.57
EITC Phase-out	0.297	2.79	0.445	2.78	1.572	3.18	0.192	2.82	0.247	2.01	0.031	0.09
Minimum Wage	0.015	2.84	0.020	2.58	0.086	3.59	0.010	3.01	0.014	2.38	0.024	1.43
Unemployment Ins.	0.001	0.12	0.001	0.05	0.026	0.61	0.002	0.39	0.007	0.64	0.042	1.29
SSI	-0.018	-0.51	-0.022	-0.41	0.026	0.19	-0.011	-0.49	-0.013	-0.31	0.092	1.03
Disability Ins.	-0.043	-2.13	-0.051	-1.72	-0.278	-2.87	-0.029	-2.25	-0.044	-1.89	-0.060	-0.83
AFDC/TANF	-0.057	-2.85	-0.083	-2.74	-0.233	-3.14	-0.037	-2.95	-0.060	-2.69	-0.063	-1.30
AFDC/TANF Need Std.	0.008	1.08	0.010	0.93	0.021	0.66	0.005	0.98	0.009	1.07	0.016	0.78
Food Stamps	0.023	0.41	0.025	0.30	-0.009	-0.04	0.012	0.34	0.054	0.85	0.364	2.48
GDP	0.029	4.36	0.046	4.55	0.132	4.03	0.020	4.57	0.035	4.43	0.083	3.40
Unemployment Rate	0.001	0.51	0.003	1.09	-0.004	-0.48	0.000	0.47	0.002	1.09	0.009	1.65
Constant	0.067	1.28	0.063	0.80	-0.392	-1.64	-0.083	-2.45	-0.134	-2.20	-0.295	-1.73
ρ	0.274		0.281		0.203		0.260		0.249		0.050	
σ_u	0.015		0.023		0.039		0.009		0.016		0.024	
σ_z	0.016		0.024		0.075		0.010		0.018		0.055	
R^2	0.382		0.360		0.412		0.407		0.427		0.327	

Table 4: Regression Results of Pre-tax Inequality for the Rural Areas

Dependent	*Gini*		*RMD*		*COV*		$I_{0.5}$		I_1		I_2	
Variable	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*
High School	-0.052	-3.81	-0.080	-3.86	-0.157	-2.11	-0.034	-3.53	-0.057	-3.39	-0.084	-2.06
College	0.144	3.45	0.211	3.29	0.446	2.16	0.095	3.25	0.171	3.31	0.301	2.57
Female Head	0.234	7.11	0.339	6.69	0.520	3.26	0.171	7.37	0.336	8.27	0.543	5.94
Family Size	0.013	1.47	0.023	1.71	0.033	0.74	0.009	1.46	0.012	1.13	-0.017	-0.68
Age <18	0.138	1.88	0.167	1.49	0.670	1.81	0.107	2.07	0.224	2.47	0.651	3.12
Age 18-29	0.061	1.17	0.082	1.02	0.237	0.85	0.050	1.33	0.103	1.58	0.241	1.58
Age >59	-0.022	-0.44	-0.013	-0.17	0.117	0.49	-0.012	-0.35	-0.036	-0.59	-0.097	-0.71
Low Tax	-0.002	-2.07	-0.003	-1.95	-0.006	-1.09	-0.001	-2.02	-0.003	-2.34	-0.006	-2.15
High Tax	-0.001	-0.04	0.009	0.22	0.038	0.27	-0.001	-0.03	-0.016	-0.50	-0.131	-1.68
EITC Benefit	-0.033	-2.75	-0.044	-2.40	-0.060	-0.89	-0.022	-2.61	-0.041	-2.72	-0.069	-1.87
EITC Phase-out	0.451	2.74	0.638	2.53	1.876	2.11	0.292	2.50	0.439	2.15	0.713	1.46
Minimum Wage	-0.004	-0.59	-0.009	-0.81	-0.020	-0.52	-0.002	-0.30	0.000	-0.03	0.035	1.60
Unemployment Ins.	0.016	1.16	0.024	1.14	-0.036	-0.47	0.007	0.69	0.012	0.69	-0.046	-1.10
SSI	-0.009	-0.21	-0.007	-0.11	0.210	1.21	0.007	0.23	-0.014	-0.27	-0.116	-1.11
Disability Ins.	-0.008	-0.28	-0.008	-0.18	-0.079	-0.46	-0.008	-0.37	-0.015	-0.39	0.044	0.47
AFDC/TANF	-0.063	-2.68	-0.078	-2.14	-0.355	-3.68	-0.055	-3.42	-0.094	-3.25	-0.135	-2.32
AFDC/TANF Need Std.	0.018	1.85	0.025	1.62	0.110	2.42	0.016	2.26	0.024	1.97	0.018	0.68
Food Stamps	0.071	1.04	0.139	1.32	-0.029	-0.10	0.028	0.60	0.079	0.94	0.139	0.81
GDP	0.031	2.94	0.045	2.84	0.086	1.46	0.023	3.07	0.040	3.06	0.057	1.79
Unemployment Rate	0.002	0.65	0.003	0.82	-0.009	-0.68	0.001	0.69	0.003	1.08	0.004	0.55
Constant	0.159	2.18	0.201	1.80	0.117	0.30	-0.046	-0.89	-0.049	-0.54	0.082	0.38
ρ	0.211		0.223		0.137		0.206		0.209		0.135	
σ_u	0.012		0.019		0.030		0.008		0.015		0.023	
σ_z	0.022		0.034		0.125		0.016		0.028		0.068	
R^2	0.385		0.368		0.254		0.397		0.423		0.273	

Table 5: Regression Results Of Post-Tax Inequality For The Rural Areas

Dependent	*Gini*		*RMD*		*COV*		$I_{0.5}$		I_1		I_2	
Variable	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*	*Coef.*	*t-stat*
High School	-0.039	-3.32	-0.059	-3.3	-0.122	-2.18	-0.022	-2.99	-0.037	-2.69	-0.038	-0.93
College	0.116	3.21	0.164	2.94	0.308	1.96	0.068	2.93	0.127	2.98	0.209	1.80
Female Head	0.184	6.43	0.258	5.89	0.320	2.63	0.117	6.43	0.244	7.25	0.457	5.03
Family Size	0.010	1.3	0.018	1.56	0.011	0.32	0.006	1.21	0.010	1.10	0.000	-0.01
Age <18	0.136	2.15	0.174	1.79	0.672	2.40	0.092	2.27	0.170	2.28	0.409	1.97
Age 18-29	0.062	1.38	0.085	1.22	0.251	1.20	0.048	1.66	0.101	1.89	0.278	1.82
Age >59	-0.018	-0.42	-0.006	-0.09	0.093	0.51	-0.010	-0.36	-0.025	-0.49	-0.094	-0.69
Low Tax	-0.002	-2.7	-0.004	-2.67	-0.006	-1.33	-0.001	-2.55	-0.003	-2.79	-0.007	-2.30
High Tax	-0.018	-0.83	-0.019	-0.55	0.013	0.12	-0.010	-0.67	-0.028	-1.06	-0.107	-1.37
EITC Benefit	-0.037	-3.6	-0.050	-3.14	-0.079	-1.56	-0.022	-3.27	-0.040	-3.23	-0.056	-1.51
EITC Phase-out	0.437	3.08	0.597	2.75	1.639	2.45	0.246	2.71	0.380	2.27	0.478	0.98
Minimum Wage	-0.004	-0.58	-0.007	-0.71	-0.005	-0.17	-0.001	-0.17	0.000	0.00	0.020	0.90
Unemployment Ins.	0.014	1.19	0.023	1.27	-0.040	-0.71	0.005	0.60	0.008	0.57	-0.070	-1.66
SSI	0.009	0.25	0.011	0.19	0.220	1.64	0.015	0.63	0.008	0.18	-0.070	-0.67
Disability Ins.	-0.007	-0.26	-0.010	-0.25	-0.019	-0.15	-0.005	-0.28	-0.009	-0.29	0.063	0.68
AFDC/TANF	-0.066	-3.16	-0.084	-2.63	-0.311	-4.16	-0.047	-3.59	-0.074	-3.08	-0.072	-1.25
AFDC/TANF Need Std.	0.015	1.69	0.020	1.47	0.097	2.78	0.011	2.05	0.016	1.62	0.019	0.73
Food Stamps	0.046	0.77	0.100	1.09	0.011	0.05	0.010	0.28	0.035	0.51	0.093	0.55
GDP	0.027	2.96	0.039	2.89	0.094	2.16	0.018	3.15	0.031	2.92	0.044	1.38
Unemployment Rate	0.001	0.35	0.002	0.53	-0.004	-0.40	0.001	0.42	0.001	0.62	0.000	-0.01
Constant	0.171	2.72	0.225	2.34	-0.003	-0.01	-0.023	-0.56	-0.011	-0.15	0.121	0.56
ρ	0.230		0.241		0.169		0.231		0.220		0.122	
σ_u	0.011		0.017		0.024		0.007		0.013		0.023	
σ_z	0.019		0.030		0.093		0.012		0.023		0.067	
R^2	0.362		0.348		0.278		0.359		0.352		0.171	

Table 6: Estimated Elasticities of Urban Inequality to Policy Variables and GDP

	Gini	*RMD*	*COV*	$I_{0.5}$	I_1	I_2
Pre-tax						
Low Tax	-0.067*	-0.047	-0.110	-0.097*	-0.111*	-0.144*
High Tax	-0.021	-0.013	0.008	-0.046	-0.055	-0.054
EITC Benefit	-0.024	-0.026	-0.046	-0.056	-0.043	-0.016
EITC Phase-out	0.084*	0.090*	0.241*	0.179*	0.098	-0.050
AFDC/TANF	-0.041*	-0.041*	-0.098*	-0.090*	-0.080*	-0.071*
Minimum Wage	0.135*	0.126*	0.369*	0.282*	0.208*	0.119
GDP	0.349*	0.378*	0.763*	0.734*	0.605*	0.361*
Female-head	0.138*	0.136*	0.183*	0.310*	0.332*	0.340*
Post-tax						
Low Tax	-0.074*	-0.078*	-0.127*	-0.119*	-0.180*	-0.196*
High Tax	-0.042*	-0.036*	-0.019	-0.082*	-0.078*	-0.050
EITC Benefit	-0.043*	-0.047*	-0.063	-0.092*	-0.085*	-0.085
EITC Phase-out	0.105*	0.110*	0.271*	0.218*	0.141*	0.008
Minimum Wage	0.125*	0.117*	0.351*	0.268*	0.192*	0.151
AFDC/TANF	-0.045*	-0.046*	-0.090*	-0.094*	-0.076*	-0.037
GDP	0.340*	0.378*	0.758*	0.756*	0.661*	0.734*
Female-head	0.135*	0.133*	0.161*	0.297*	0.322*	0.370*

* statistically significant different than zero at 5% level

Table 7: Estimated Elasticities of Rural Inequality to Policy Variables and GDP

	Gini	*RMD*	*COV*	$I_{0.5}$	I_1	I_2
Pre-tax						
Low Tax	-0.068*	-0.071	-0.094	-0.100*	-0.153*	-0.151*
High Tax	-0.001	0.006	0.018	-0.003	-0.024	-0.098*
EITC Benefit	-0.071*	-0.066*	-0.060	-0.140*	-0.132*	-0.111*
EITC Phase-out	0.144*	0.142*	0.277*	0.273*	0.210*	0.169
Minimum Wage	-0.030	-0.048	-0.071	-0.045	-0.002	0.198
AFDC	-0.045*	-0.039*	-0.118*	-0.115*	-0.101*	-0.072*
GDP	0.332*	0.337*	0.428	0.724*	0.644*	0.454*
Female-head	0.108*	0.109*	0.112*	0.232*	0.233*	0.187*
Post-tax						
Low Tax	-0.075*	-0.105*	-0.110	-0.124*	-0.187*	-0.208*
High Tax	-0.020	-0.015	0.007	-0.037	-0.052	-0.094
EITC Benefit	-0.089*	-0.084*	-0.092	-0.173*	-0.160*	-0.106
EITC Phase-out	0.155*	0.147*	0.282*	0.286*	0.223*	0.133
Minimum Wage	-0.034	-0.041	-0.021	-0.028	-0.0001	0.133
AFDC	-0.052*	-0.046*	-0.120*	-0.122*	-0.097*	-0.045
GDP	0.321*	0.324*	0.544*	0.703*	0.613*	0.413
Female-head	0.094*	0.092*	0.080*	0.197*	0.208*	0.185*

* statistically significant different than zero at 5% level

Table 8: Welfare Gains or Losses from a 10% Increase in Policy and Female-Head Variables

	Urban			*Rural*		
	$I_{0.5}$	I_1	I_2	$I_{0.5}$	I_1	I_2
Pre-tax						
Low Tax	21.6*	43.2	129.6	17.2*	51.6*	103.1*
High Tax	9.1	21.7	42.8	0.5	7.3	59.4
EITC Benefit	18.4	28.7	20.5	35.4	65.9	110.9
EITC Phase-out	-46.4*	-49.9*	52.1*	-54.5*	-81.9	-133.0*
Minimum Wage	-57.6*	-84.2*	-97.5*	7.0*	0.1*	-123.3
AFDC/TANF	15.7*	27.5*	50.1*	15.3*	26.2*	37.6*
Female-head	-63.7*	-134.2*	-281.5*	-39.8*	-78.2*	-126.3*
Post-tax						
Low Tax	19.3*	58.0*	135.2*	15.8*	47.5*	110.7*
High Tax	11.7*	22.4*	30.6	4.2*	11.7*	44.7
EITC Benefit	22.0*	40.3*	86.1	32.5*	59.2*	82.8
EITC Phase-out	-40.8*	-52.5*	-6.6*	-42.2*	-65.2*	-82.0
Minimum Wage	-39.6*	-55.5*	-95.1*	3.2*	0.1*	-64.8
AFDC/TANF	11.8*	19.2*	20.2*	12.0*	19.0*	18.4
Female-head	-44.2*	-95.3*	-235.0*	-25.0*	-52.2*	-97.8*

* statistically significant different than zero at 5% level

Figure 1: Gini Indexes of Rural and Urban Areas (urban: solid; rural: dashed)