The Effects of Local Government Expenditures on Income Mobility in the U.S.: 1982-1997

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Honors Thesis

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1. Introduction

The probability that Americans will rise to higher income percentiles over the course of their lives varies across the United States. For example, children who were born below the twenty-fifth income percentile in Salt Lake City in 1980 and 1981 rose, on average, to the forty-sixth percentile as adults, while those born in Charlotte, North Carolina on average climbed only to the thirty-fifth percentile (Chetty et. al 2013). The cause of this variation across American cities remains to be explained. One possibility is that the actions of local governments play a significant role in helping low-income residents enter the middle class. Because local government entities such as municipalities, counties and school districts provide public services to the region, local government expenditures may play a significant role in residents' economic mobility.

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Local governments spend money to provide public goods in their region. In 2011, total local government expenditures in the United States exceeded $1.6 trillion. In comparison federal government non-defense expenditures, for the 2011 fiscal year amounted to $2.9 trillion and discretionary spending totaled only $700 billion.[1] While the roles of local governments vary by type and place, their expenditures include fire protection, public safety, parks and recreation, utilities, economic development, education, and transportation. Any of these services might affect the economic landscape of the city. Better transportation infrastructure might lower the costs of commuting to work. Improvements in the local police force could correspond to reductions in the crime rate,

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[1] Local government expenditure levels come from the U.S. Census Bureau, "State and Local Government Finances Summary: 2011", July 2011, accessed March 30, 2014, http://www2.census.gov/govs/local/summary_report.pdf. Federal Expenditures come from the Congressional Budget Office "The U.S. Federal Budget," Accessed April 7, 2014. http://www.cbo.gov/sites/default/files/cbofiles/new/budgetinfographic.png.

which creates a better environment for children to thrive. As local governments provide these services, an additional outcome might be the increased ability of low-income households to enter the middle class.

Research into income mobility in the United States recently benefited from the work of Chetty et. al (2013), who measured variation in income mobility across commuting zones in the United States. (Commuting zones are local geographic units that are similar to metropolitan statistical areas in size, but include rural areas and thus cover the entire United States.) Their data revealed that the economic outcomes of Americans varied significantly depending on where they were born (Figure 1). It also prompted further questions about the causes for each commuting zone's different level of income mobility. In their study, Chetty et. al focus on the effects of progressive tax expenditures on income mobility and show a positive relationship. They note, however, that tax expenditures only explain part of the variation in income mobility across commuting zones. Interestingly, they place local government expenditures in 1992 among a list of variables that are correlated with income mobility, but which require further study. I seek to test whether local government expenditures affect a commuting zone's income mobility.

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I combine local government expenditures data from the Census Survey of Governments with data on income mobility created by Chetty et. al to estimate the relationship between local government expenditures and income mobility for children born in 1980 to 1981. I hypothesize that local government expenditures should have a positive effect on income mobility i.e. places that increase public expenditures should benefit from increases in income mobility. My results indicate that local government

expenditures have a significant effect on income mobility. However the type of effect depends on the timing of expenditures and the category of service that they fund.

2. Data

The Census Survey of Governments compiles annual finance records—revenues and expenditures—for local governments. The survey samples every government unit—counties, municipalities, school districts, townships and special districts—for years ending in "2" or "7." For the other years, the survey samples a non-random subset of government units that emphasizes larger cities. To avoid the bias of excluded government units that may affect my data, I focus on local government expenditure data for the years ending in "2" and "7" when all governments were sampled. For each of these years, I focus on variables that measure total expenditures by the governments, and specific expenditures on welfare and education. [2]

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All finance data for local government units in the Census Survey of Governments existed originally as an observation of each local government unit. Those units that were part of the same county (including the county government itself) were added together to form observations of the total amount of expenditures by all local governments within a county. Each observation in the dataset then represents the total expenditures by local government entities within that county for a given year. Using Federal Information Processing Standards (FIPS) codes, which are 5-digit codes that uniquely identify counties within the United States and were added to the Census Survey of Governments data by researchers at the National Bureau of Economic Research, I assigned each county-year observation to the list of commuting zones provided by Chetty et. al. After this, the data

[2] "Annual Survey of Governments Finance Data," National Bureau of Economic Research, accessed March 2, 2014, http://www.nber.org/asg/.

observations denoted total local government expenditures by all governments within a commuting zone.

The Census also provides demographic data that I use as controls to isolate the effect of local government expenditures in my model. Regional characteristics, including racial composition, income, and median age are available at the county level from the Census. Data prior 1990, is available in the Census's City and County Data Books, available online from the Inter-University Consortium for Political and Social Research. From that source I compiled measurements of the median age, unemployment, prevalence of manufacturing, racial composition, public school enrollment, social security payment recipients, divorce rate, crime rate, median income and median house prices for the 1980s. I gathered data for the same variables for the 1990s from the US Census Counties database. A summary statistics table of these covariates is shown in Table 6 of the Appendix.

The income mobility data was created by Chetty et. al (2013). This variable is measured by recording the incomes for the generation of children born in 1980 and 1981 at two points in their lives. The child's household income is first recorded in 1996 when the child is approximately 15 years old. The child's household income is measured again in 2011, when they are adults. The first measurement of income in 1996 is taken as "parent income" and the second in 2011 as "child adult income." Then, parent income is regressed on child income. This regression represents the expected level of child income given a certain level of parent income, and provides the measure of mobility. This regression is written in the following equation:

$$y_{ic} = \gamma_c + \eta_c x_{ic} + \varepsilon_{ic} \qquad (1)$$

for individual i in commuting zone c, where y is child income percentile and x is parent income percentile, γ is an intercept and ε is an error term. Thus, the coefficient in this regression represents the effect of parent income rank on child rank. Then, define

$$\bar{y}_{pc} = \gamma_c + \eta_c p \qquad (2)$$

as the expected income percentile of child for parent income percentile, p. This expected value of child income, given parent income, sets the basis for measuring income mobility. Using this model, Chetty et. al provide two types of mobility measurement, relative and absolute. Relative mobility represents the difference between the expected outcomes for the rich versus the poor. Relative mobility is the slope of parent income, multiplied by 100. This is interpreted as the difference in expected outcomes of an individual born in the top percentile and the person born in the bottom percentile ($\bar{y}_{100,c} - \bar{y}_{0,c} = 100 \times \eta_c$). On the other hand, absolute mobility asks how high individuals born into low incomes are expected to rise. In particular, it represents the expected income percentile of individuals born into the bottom fourth of income percentiles. Absolute mobility equals $\bar{y}_{25,c}$ and represents the expected outcome for somebody born into the 25th income percentile, the bottom quartile, defined by parental income in 1996, when the child is approximately 15.

It should be noted that CZ's are assigned permanently for the location of the child's residence at the age of fifteen. Therefore, this location assignment does not account for moving after or before the age of 15 and does not indicate that the child spent all or most of his or her youth in that CZ. For local government expenditures, like public safety or transportation, the benefit of the public good would only be received if the individual lived in that CZ for an extended period of time and didn't move.

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3. Methodology

In an attempt to investigate the relationship between per capita expenditures and income mobility, I sought to test two main possibilities:

1) Per capita expenditures have a significant relationship with income mobility. If the relationship between expenditures and mobility is positive, this would suggest that local government expenditures tend to provide an environment and/or opportunities that help low income individuals to achieve higher incomes. If the two variables presented a negative relationship, this would suggest that expenditures interrupt instead of facilitate mobility. For example, bad policies may make it harder for individuals to access the opportunities that lead to advancement.
2) Per capita expenditures do not have a significant relationship with income mobility. This may mean that while local government expenditures provide public services, those services do not help the poor achieve higher incomes. For example, public safety, good parks, housing, and transportation may improve the quality of life for residents but an insignificant relationship would suggest that the combined impact of these services has a negligible impact on income mobility. Alternatively an insignificant relationship might suggest that *how* governments spend their money matters more than *how much* they spend and thus without observing efficiency or quality of expenditures, the "true" effect of good local expenditures cannot be measured. Charles Tiebout's model suggests, for example, that the allocation of public goods may be inferior where individuals feel less mobile or are less informed about local government expenditures (Tiebout 1956).

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To test the hypotheses described above, I estimate the linear effect of per capita expenditures on income mobility in the following model with an intercept and a set of controls for other commuting zone-specific effects:

$$IM_i = \alpha + \beta_1'PCExp_i + \beta_2CZ'_i + \delta_1Pop'_i + \delta_2State_i + \varepsilon_i \qquad (3)$$

Here *IM* represents the level of income mobility for each commuting zone, *i*. *PCExp* denotes a vector of variables that I use to measure per capita expenditures. *CZ'* denotes a vector of commuting zone characteristic controls. *Pop* is a vector of population size dummy variables. *State* is a vector of state fixed effects, α is an intercept and ε is an error term.

The estimate of β_1', the coefficient on *PCExp,* is the primary parameter of interest for this study. This coefficient represents the effect on income mobility of an increase in per capita expenditures. I estimate β_1' with two different measures of expenditures per capita. First, I include expenditures as three different variables, each representing the mean expenditures of each of the two decades following the child's birth (1980s, and 1990s). This regression takes the following form:

$$IM_i = \alpha + \beta_{1,1}\, PCExp_{\,1980s,i} + \beta_{1,2}'\, PCExp_{\,1990s,i} + \beta_2'CZ'_i + \delta_1'Pop'_i + \delta_2'State_i' + \varepsilon_i \qquad (4)$$

Second, I include expenditures as six variables representing the total amount spent in years ending in 2 or 7 for each of the two decades.

$$IM_i = \alpha + \beta_{1,1}PCExp_{\,1982,i} + \beta_{1,2}PCExp_{\,1987,i} + \beta_{1,3}\, PCExp_{\,1992,i} + + \beta_{1,4}\, PCExp_{\,1997,i}$$
$$+ \beta_2CZ'_i + \delta_1Pop'_i + \delta_2State_i + \varepsilon_i \qquad (5)$$

As described in the Data section, expenditures means the sum of expenditures for every local government unit within the commuting zone, including counties, municipalities,

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townships, school districts, and special districts. I do not count state expenditures because the aggregate Census data does not specify which commuting zone the state money went to. Thus state expenditures from this data source could not explain commuting zone-level variation in income mobility.

Per capita expenditures are measured for separate time periods, but the periods are highly correlated with each other (Tables 1 and 2). Thus, they are likely to introduce multicollinearity into the model, making estimation of the individual parameters difficult. Therefore, I include analysis of the joint significance of different measures of expenditures in addition to analysis of individual parameters. The variables are adjusted for inflation so that estimation of the total effect of the sum of parameters is accurate when spanning decades.

The effect of per capita expenditures on income mobility may be subject to economies of scale. For example, the size of a city may affect the relationship. Holcomb and Williams (2008) suggest that economies of scale may affect per capita expenditures across quartile population ranks, but not within these groups. Therefore, I include *Pop*, which is a vector of dummy variables for the first, second and third quartile of population rank of the commuting zone.

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Local government roles vary from state to state. For example, in some states, municipal authorities provide K-12 education while in other states a separate local government, like a school district, provides that service. To account for these across-state differences in local government functions I adopt Holcomb and Williams (2008) method of inserting a set of dummy variables for each state, represented by *State* in equations (3)-(5).

These state fixed effects account for variation in state characteristics, such as demographics and politics for example, as well as variation in state expenditures across states.

Beyond local government expenditures, many other characteristics of commuting zones may correlate with both per capita expenditures and income mobility. Excluding these variables would lead to omitted variable bias in my estimates of local government expenditures. To control for these factors, I include a set of CZ characteristic controls for each of the decades in which I measure local government expenditures, represented by *CZ*' in equations (3) through (5). These controls are: median age, unemployment rate, number of people employed in manufacturing, white population, number of children enrolled in public school, social security recipients, divorce rate, crime rate, median income and median house prices for each of the two decades in which I measure local government expenditures, the 1980s and 1990s. A summary statistics table for these covariates is provided in Table 6.

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4. Results

To investigate the relationship between local government expenditures and income mobility, I use the model described above to regress income mobility on expenditures and a set of controls. Below, I present the results of the regressions.

I first regress absolute mobility on mean expenditures for each of the two decades, excluding all other controls (Table 3, Column 1). In this regression, the coefficients on expenditures in the 1980's and 1990's are both statistically significant at the 0.1% level. The coefficient on the 1980's is negative and equal to -0.881 while the coefficient on the 1990's is positive and equal to 1.619. The negative coefficient on 1980s expenditures suggests that an increase in expenditures actually leads to a reduction in mobility for low-

income individuals. However, the positive coefficient on the 1990's suggests the opposite; that greater per capita expenditures increase mobility. The summed effect of these variables is positive and significant at the 0.1% level with a coefficient of 0.738. This joint coefficient means that a $1,000 increase in local government expenditures within a commuting zone increases the expected income percentile for an individual born at or below the 25^{th} percentile by 0.738 percentiles.

To account for the probable omitted variable bias when per capita expenditures are the only independent variables, I estimate the same coefficients, when including a set of commuting zone characteristic controls (Table 3, Column 2). When these commuting zone controls are added, the estimated effect of per capita expenditures shrink in magnitude, suggesting that excluding the controls did lead to omitted variables bias. With the controls included, the coefficient on 1980's expenditures is now statistically significant only at the 10% level, but still negative, equaling -0.170. The variable for 1990's expenditures is still positive at 0.319, but also statistically significant at the 10% level. Jointly, the sum effect of these variables is also statistically significant at the 10% level and positive with a coefficient of 0.149. The interpretation of this coefficient says that a $1,000 increase in per capita expenditures over the period of both decades increases the expected income of an individual born into the bottom quartile by 0.149 percentiles.

Including state fixed effects increases the magnitude and statistical significance of the parameters on expenditure variables, so that the individual parameters are now significant at the 5% level and their joint effect is significant at the 5% level (Table 3, Column 3). Individually the coefficient on per capita expenditures in the 1980s is again negative and equal to -0.237 while the coefficient on the 1990's expenditures is positive

and equal to 0.407. Together, the summed the effect of these parameters is also positive and equal to 0.171, and statistically significant only at the 5% level. The inclusion of state fixed effects increases the goodness of fit of the regression from 0.797 to 0.892.

In order to test the possibility that the individual year, and not just the decade of expenditure matters, I regress income mobility on four expenditure variables for which the year-specific data is available (Table 4, Column 1). In this regression, the parameter estimates for expenditures in 1982 and 1992 are both statistically insignificant. However, the coefficients for 1987 and 1997 are negative and positive, respectively, and both statistically significant at the 5% level. The coefficient on 1987 expenditures equals -1.364 while the coefficient on 1997 expenditures equals 2.033. The summed effect of all four variables is statistically significant the 0.1% level that amounts to 0.799, suggesting that an increase in expenditures of $1,000 for a year within the years recorded leads to an increase in the expected income percentile of an individual born into the 25^{th} percentile by 0.799 percentiles (Table 4, Column 1).

The inclusion of commuting zone controls reduces the magnitude, of the parameter estimates of the individual years (Table 4, Column 2). The coefficient on 1987 has a negative effect that is statistically significant at the 5% level and equal to -0.677. The coefficient on 1992 has a positive coefficient equal to 0.423, but is only statistically significant at the 10% level. The summed effect of all four coefficients is positive, but not statistically significant, and smaller than when commuting zone characteristic controls were excluded.

The addition of state fixed effects increases the statistical significance of the parameters on 1987 and 1997 expenditures, however the effect of expenditures in 1992

becomes statistically insignificant. The individual estimates for 1987 and 1997 are now statistically significant at the 0.1% and 5% significance level, respectively, and all four parameters have an added effect that is significant at the 10% level. The coefficient on per capita expenditures from 1987 equals −0.587 and is significant at the 0.1% level, while the coefficient on per capita expenditures from 1997 equals 0.383 and is statistically significant at the 5% level. The added effect of all four years is statistically significant at the 10% level and positive, equaling 0.148. Including state fixed effects and CZ demographic controls, the R-squared is equal to 0.893, up from 0.799, when state fixed effects are excluded.

In order to begin the work of estimating the different effect of particular categories of expenditures, I look at two specific categories that may have a stated goal of helping low-income children rise out of poverty, education and public welfare expenditures. I regress absolute mobility on per capita expenditures for education, public welfare, and "other" categories for the means of the sampled years in the 1980s and the 1990s (Table 5, Column 1). In this regression, the parameter on per capita expenditures on welfare in the 1980s is statistically significant at the 10% level and positive, equal to 8.974. The coefficient on education expenditures in the 1990s is positive, equal to 4.430 and statistically significant at the 0.1% level. The coefficient on per capita expenditures on other services in the 1980s is statistically significant at the 0.1% level and negative, equaling −0.808. The summed effect of education expenditures in both decades is statistically significant at the 0.1% level and positive, equaling 4.697.

When CZ demographic controls are added to this regression, statistical significance disappears for all but the parameters on public welfare expenditures. The effect of public welfare expenditures in the 1980s gains statistical significance, and now has a positive

parameter of 6.611 and is statistically significant at the 5% level. Expenditures on other categories for each decade are no longer statistically significant. The sum of the effect of education expenditures from both periods is positive, equaling 0.788, but only significant at the 10% level. The summed effect of public welfare expenditures is statistically significant at the 0.1% level and positive, at 3.031.

The introduction of state fixed effects into this regression (Table 5, Column 3) substantially changes the direction and significance level of these coefficients. The individual decade parameters for education and public welfare are now all statistically insignificant. Real capita expenditures on other categories in the 1990s are statistically significant at the 5% level and positive, equaling 0.396. The summed effect of per capita expenditures on education in the 1980s and 1990s is statistically insignificant while those for public welfare in the 1980s and 1990s are only significant at the 10% level, but large and negative, equaling −3.209, with a 95% confidence interval spanning −6.973 to 0.554. When including state fixed effects, the summed effect of other per capita expenditures is positive, equaling 0.205, and significant at the 0.1% level.

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As suggested by the regressions above, one factor that may determine the importance of local government expenditures on income mobility in different commuting zones is the way that local governments spend their money. I provide a breakdown of the general composition of expenditures divided between welfare, education and other categories in Figures 2 through 4. In these pie charts, public welfare makes up approximately 2% of average local government spending across commuting zones, education makes up over 40%, and other expenditures amount to over 55% of expenditures.

In Figure 5, I provide a pie chart that shows the average amount spent on a selection of additional spending categories. While the effect of these additional categories on income mobility is not considered in this study, further research may consider their role in regional income mobility. This chart reveals that education makes up the single largest category with over 41% of the total spending by local governments from 1982 to 1997. Other categories that may be expected have an effect on income mobility (if only because they absorb funds that might otherwise improve income mobility) add up to slightly less than 20% of local government spending in the same period. Other types of spending, which may include administration, utilities and infrastructure costs among others amount to over a third of the remaining spending from 1982 to 1997 with over 39% of total local government spending.

5. Discussion

My results point to a statistically significant relationship between local government expenditures and income mobility. When controlling for commuting zone demographic controls and state fixed effects, my results reveal that various measures of local government expenditures have a statistically significant relationship with income mobility. However, the results suggest that the kind of effect that expenditures create depends on the timing of spending and the types of programs that receive the expenditures.

The results shown in Tables 3 and 4 indicate that the effect of local government expenditures fluctuates across time periods. For example, an increase in per capita expenditures of $1,000 in 1987 alone decreases mobility by 0.587 percentiles while an equal increase in expenditures in 1997 improves mobility by 0.383 percentiles. Put another way, an increase in local government expenditures in 1987 worsens the expected outcome

for individuals born into the bottom quartile while the same level of expenditures in 1997 improves the expected outcome for the same individual. These results suggest that the timing of expenditures makes a significant difference in their effect, even leading to opposite effects in one period versus another. While this study cannot conclude what causes such different consequences of expenditures, these results suggest that there may be a relationship between the time that expenditures increase, with respect to the child's age, and the effect of expenditures on that child. Alternatively, different time periods may matter, not via the age of the child, but because the composition of expenditures or the policies were different in the 1987 from the 1997. In order to better understand the relationship between expenditures and income mobility, future research could explore how expenditures impact individuals differently at different times.

In the next set of regressions shown in Table 5, I highlight two categories of local government expenditures that may be expected to have a stated goal of improving outcomes for low-income individuals. However, somewhat surprising results suggest that public welfare expenditures have a negative effect on income mobility and that education expenditures have little impact at all.

The coefficient on local government expenditures on public welfare in Table 5, Column 3 suggest that an increase of $1,000 per capita by local governments on public welfare may decrease the expected income percentile of an individual born into the bottom quartile by over 3 percentiles, even when controlling for indicators of poverty within a commuting zone. This coefficient is only significant at the 10% level and it's 95% confidence interval spans -6.972 to .555. Thus, these results cannot rule out the possibility that welfare expenditures have either a negligible or a positive effect on mobility. However

the large negative coefficient contradicts the results that we might expect from successful welfare expenditures. Such expenditures might be expected to provide an improved quality of life for children born into poverty and thus better opportunities to reach higher incomes as adults. However, while these results are not conclusive evidence that welfare expenditures worsen conditions for the children of the poor, they do not support a view that such expenditures help low-income children rise out of poverty.

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While, this study cannot conclude why such a negative relationship exists between welfare and mobility, we can speculate about some possibilities. First, welfare expenditures may support unsuccessful polices. Perhaps, for example, welfare expenditures fund subsidized housing projects that isolate low-income individuals away from career opportunities. While these expenditures may then provide important services for the poor, such as housing, the way that they are provided may introduce other costs onto the poor. Alternatively, as some argue, these programs may create dependence on welfare and remove incentives to pursue well-paying jobs. Along this argument, welfare expenditures, in principle, may hurt rather than help the poor.

In addition to the negative parameter on public welfare expenditures, the regression in Table 5, Column 3 leads to an estimate on education that is statistically insignificant. This suggests that education expenditures do not have an effect on mobility for low-income individuals. Increases in expenditures for public education might be expected to provide valuable job skills for individuals of all incomes. These skills would then allow children born into low-income households to reach higher incomes as adults. However, my results suggest that education expenditures alone do not lead low-income individuals to reach higher incomes. This may be the case if public education expenditures support programs

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like college preparatory classes that increase mobility for middle-class students, but not children in the bottom quartile. An alternative interpretation is that expenditures on public education do in fact help low income children realize higher incomes as adults, but that they lead to an equal advance for middle-income children. Because absolute mobility measures incomes in percentiles, if public education expenditures lead all students to higher incomes than they were born into *as well as* low-income individuals, then this would not lead to an increase in expected income *percentiles* for low-income children.

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The results of the regression in Table 5 also indicate that the aggregate effect of various local government services, excluding welfare and education, over both decades, has a significant positive effect on mobility. The coefficient on expenditures for services other than welfare and education, summed over the 1980s and 1990s, is positive and statistically significant at the 0.1% level. This coefficient of 0.205 suggests that a $1,000 increase in expenditures on services excluding education and welfare increases the expected income percentile of low-income children by almost a quarter of a percentile. This suggests that the aggregate effect of expenditures by local governments within a commuting zone, excluding welfare and education, lead to small but statistically significant increases in income mobility within their commuting zone. This consequence may arise from the combined effect of improvements in commuting zones that accompany better public safety, recreation options, transportation, utilities, and public health that improve the quality of life and help people to pursue opportunities for advancement. Alternatively, as suggested by the different effects of education and welfare spending, each individual category of public service mentioned above may have varying effects. The positive effect on mobility may be the result of one service, while other services have negligible effects. The specific

categories of expenditures that lead to the aggregate increase in mobility of 0.205 percentiles should be the subject of further research. Whatever the breakdown of the effect of expenditures, this coefficient suggests that the aggregate effect of increased expenditures benefits the income mobility for poor children within a commuting zone.

State fixed effects play another important role in my model. This set of dummy variables captures the difference in mean outcomes for each state. It is included in the model to account for two main differences across states: the different roles of local governments within states and the differences of state governments themselves. The change in the size of the coefficient on local government expenditures after adding state fixed effects (in Column 3 of Tables 3 through 5) suggests that across-state differences play a role in the variation in income mobility across the U.S. Education, welfare, and tax policies, directed to helping the poor rise to higher incomes, vary across states and the state fixed effects in my model suggests that these policies create significantly different outcomes for residents of each state.

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The political economy of commuting zones likely varies across states and local governments and may influence the policies that affect income mobility. For example, Ichinio, Karabarbounis, and Moretti (2011) suggest that in countries where the poor participate more in politics, there are more likely to be redistributive government policies. Political economy may also matter across commuting zones as it does across countries and thus local expenditures may more often be spent on services aimed at improving income mobility for low-income earners in some commuting zones and not others depending on each unit's political economy. Thus a future model could control for across-commuting

zone factors of political economy to further to address what types of government expenditures improve mobility and which do not.

6. Conclusion

This study estimates the effect of local government expenditures on the expected incomes for low-income individuals. The primary question of this research asks whether or not commuting zones that delivered a greater provision of public expenditures to their residents created better economic mobility for the poor. My results reveal a statistically significant relationship between local government expenditures and income mobility when controlling for demographic factors within commuting zones, as well as differences across states. However, the estimates suggest that the kind of impact (positive or negative) and the significance of the effects depends on when expenditures occurred and what programs they funded. Further research might improve our understanding of how local governments affect income mobility through investigation into the causes for different effects across time, the effects of different types of local government policies, and the effects of state expenditures.

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7. Appendix

Table 1 **This table shows the correlation between per capita expenditures, measured as the mean of the sampled years, within each decade.**

VARIABLES	Per Capita Expenditures 1980s	Per Capita Expenditures 1990s
Per Capita Expenditures 80's	1.00	
Per Capita Expenditures 90's	0.97	1.00

Table 2 **This table shows the correlation between per capita expenditures, measured as the mean of the sampled years, within each decade.**

VARIABLES	Per Capita Expenditures '82	Per Capita Expenditures '87	Per Capita Expenditures '92	Per Capita Expenditures '97
Per Capita Expenditures '82	1.00			
Per Capita Expenditures '87	0.99	1.00		
Per Capita Expenditures '92	0.96	0.96	1.00	
Per Capita Expenditures '97	0.94	0.96	0.96	1.00

Table 3 This table shows the results of regressions of absolute mobility on per capita expenditures for the averages of years sampled by the Census Survey of Governments. [3]

VARIABLES	(1) Absolute Mobility	(2) Absolute Mobility	(3) Absolute Mobility
Per Capita Expenditures '80s	-0.881***	-0.170*	-0.237**
	(0.142)	(0.100)	(0.095)
Per Capita Expenditures '90s	1.619***	0.319*	0.407**
	(0.257)	(0.180)	(0.175)
CZ Demographic Controls		X	X
State Fixed Effects			X
Constant	40.77 ***	31.12***	37.12***
	(0.563)	(2.786)	(2.387)
Joint Effect of '90s and '80s	0.738***	0.149*	0.171**
	(0.125)	(0.090)	(0.083)
Observations	701	701	701
R-squared	0.043	0.797	0.892

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[3] This regression includes dummy variables that represent the effect of missing observations in the data.

Table 4 This table shows the results of regressions of absolute mobility on per capita expenditures for specific years sampled by the Census Survey of Governments.[4]

VARIABLES	(1) Absolute Mobility	(2) Absolute Mobility	(3) Absolute Mobility
Per Capita Expenditures '82	0.143	0.164	0.102
	(0.288)	(0.144)	(0.102)
Per Capita Expenditures '87	-1.364**	-0.677**	-0.587***
	(0.640)	(0.297)	(0.211)
Per Capita Expenditures '92	0.0464	0.423*	0.252
	(0.516)	(0.236)	(0.183)
Per Capita Expenditures '97	2.033***	0.194	0.383**
	(0.432)	(0.228)	(0.191)
CZ Demographic Controls		X	X
State Fixed Effects			X
Constant	40.30***	31.01***	36.66***
	(0.605)	(2.759)	(2.373)
Joint Effect of '82, '87, '92 and '97	0.799***	0.104	0.148*
	(0.141)	(0.091)	(0.079)
Observations	701	701	701
R-squared	0.061	0.799	0.893

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[4] This regression includes dummy variables that represent the effect of missing observations in the data.

Table 5 This table shows the results of regressions of absolute mobility on per capita expenditures on specific categories likely to affect low-income individuals, demographic controls and state fixed effects. [5]

VARIABLES	(1) Absolute Mobility	(2) Absolute Mobility	(3) Absolute Mobility
Per Capita Expenditures '80s, Education	0.267 (0.891)	-0.047 (0.721)	-0.667 (0.739)
Per Capita Expenditures '90s, Education	4.430*** (1.100)	0.835 (0.727)	0.684 (0.715)
Per Capita Expenditures '80s, Public Welfare	8.974* (4.805)	6.611** (2.585)	-2.984 (2.739)
Per Capita Expenditures '90s, Public Welfare	-7.082 (4.368)	-3.580 (2.273)	-0.225 (2.143)
Per Capita Expenditures '80s Minus Education and Public Welfare	-0.808*** (0.247)	-0.068 (0.168)	-0.191 (0.149)
Per Capita Expenditures '90s Minus Education and Public Welfare	0.721 (0.496)	0.064 (0.260)	0.396** (0.195)
CZ Demographic Controls		X	X
State Fixed Effects			X
Constant	36.70*** (0.903)	32.06*** (2.764)	36.98*** (2.401)
Joint Effect of '80s and '90s Education Exps.	4.697*** (0.667)	0.788* (0.462)	-0.016 (0.447)
Joint Effect of '80s and '90s Welfare Exps.	1.891 (1.646)	3.031*** (0.989)	-3.209* (1.916)
Joint Effect of '80s and '90s Non-Welfare-Education Exps.	-0.087 (0.294)	-0.004 (0.127)	0.205*** (0.074)
Observations	701	701	701
R-squared	0.117	0.802	0.892

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[5] This regression includes dummy variables that represent the effect of missing observations in the data.

Table 6 Summary statistics for commuting zone (CZ) demographic controls. Group 1 is the set of observations with per capita greater than the median of per capita expenditures for the period spanning 1972 to 1997. Group 2 is group of observations above the median. "Mean#" denotes the mean of Group #. "Min#" denotes minimum of Group #. "Max#" denotes the maximum of Group 1. ΔMean represents difference in mean values for two groups, which is statistically significant at the five percent level if accompanied by two or more asterisks.

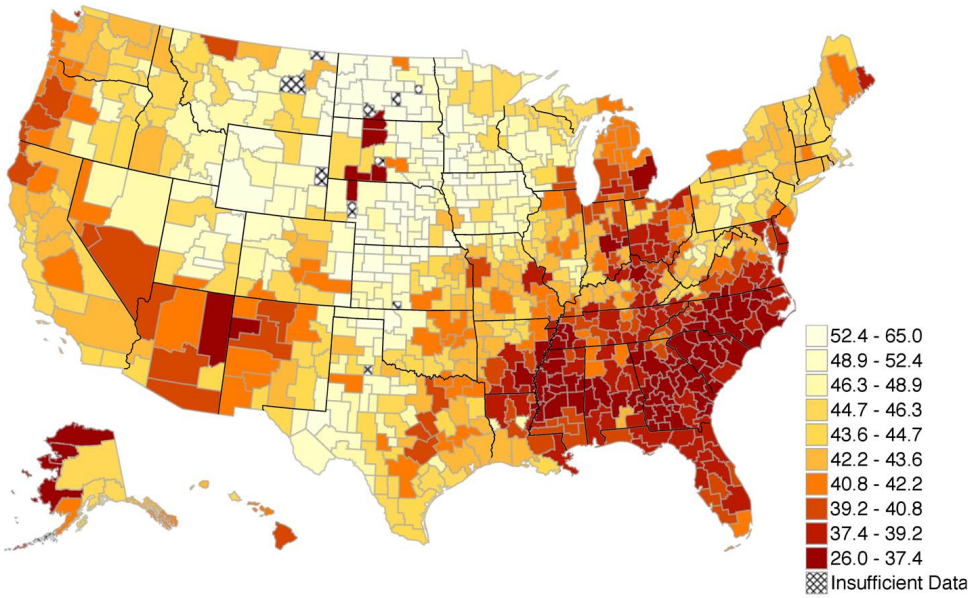
	(1)		(2)		(3)		(4)
VARIABLES	Mean 1	Mean 2	Min 1	Min 2	Max 1	Max 2	ΔMean
Median Income '79	12,712	13,202	1.00e-08	1.00e-08	21,281	27,375	
Median Age '80	122.6	102.8	1.00e-08	0	515	513.9	19.74***
Median House Price '80	30,125	38,265	1.00e-08	1.00e-08	60,550	130,400	8139.5***
% Urban '80	0.459	0.784	0	0	5.565	103.7	0.326
% White '80	0.827	1.094	0	0	5.781	117.1	0.267
Rate of Teen Births '80	0.00300	0.00341	0	0	0.0133	0.348	0.0004
% Employed in Manufacturing '80	0.0855	0.0987	0	0	0.320	13.55	0.013
Crime Rate '81	2,548	3,282	0	0	8,818	17,342	734.96***
Divorce Rate '84	38,677	205,988	1.00e-08	1.00e-08	368,983	4.765e+07	-167310.9
Crime Rate '85	0.0285	0.0593	0	0	0.246	6.975	0.031
% Social Security Payment Recipients '85	0.185	0.234	0	0	1.256	20.58	0.049
Median House Price '99	45,615	57,674	18,700	14,999	171,500	299,400	12060***
Percent Unemployed '90	7.229	6.346	1.167	1	19.25	21.10	0.883***
Median Age '90	34.78	34.49	25.15	21.34	51	45.57	0.297
% White '90	0.902	0.948	0.337	0.00851	5.642	11.04	-0.046
% Urban '90	0.468	0.579	0	0	4.611	11.46	0.111**
% Employed in Manufacturing '97	0.0648	0.0449	0	0	0.259	0.297	0.020***
% Divorced Males '90	0.0288	0.0317	0.0102	0.000583	0.230	0.579	0.003

Table 6 continued

	(1)		(2)		(3)		(4)
VARIABLES	Mean1	Mean2	Min1	Min2	Max1	Max2	ΔMean
% Social Security Payment Recipients '96	0.209	0.197	0.0950	0	1.224	1.545	0.012*
% Public School Enrollment '97	0.193	0.211	0	0	0.966	3.516	0.018
Crime Rate '96	167.0	518.1	0	0	5,132	26,250	351.0***
Median Household Income '99	21,445	24,779	11,534	12,262	41,072	51,112	3334.1***

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1 This map, created by Chetty et. al (2013) maps absolute income mobility across United States commuting zones. Absolute mobility represents the expected income percentiles for individuals born into households at or below the 25th percentile. Darker areas on the map indicate lower levels of mobility.



Source: http://obs.rc.fas.harvard.edu/chetty/website/v2.1/absolute_upward_mobility.jpg

Figure 2 **This pie chart shows the portion of mean expenditures that went to each of the three spending categories of the regression in Table 5 for the 1980's. Expenditures are measured per capita.**

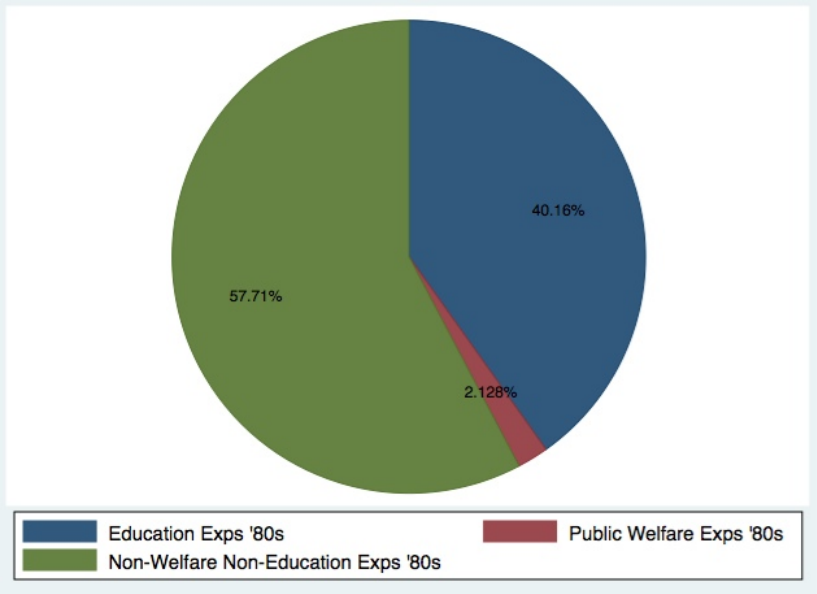


Figure 3 **This pie chart shows the portion of mean expenditures that went to each of the three spending categories of the regression in Table 5 for the 1990's. Expenditures are measured per capita.**

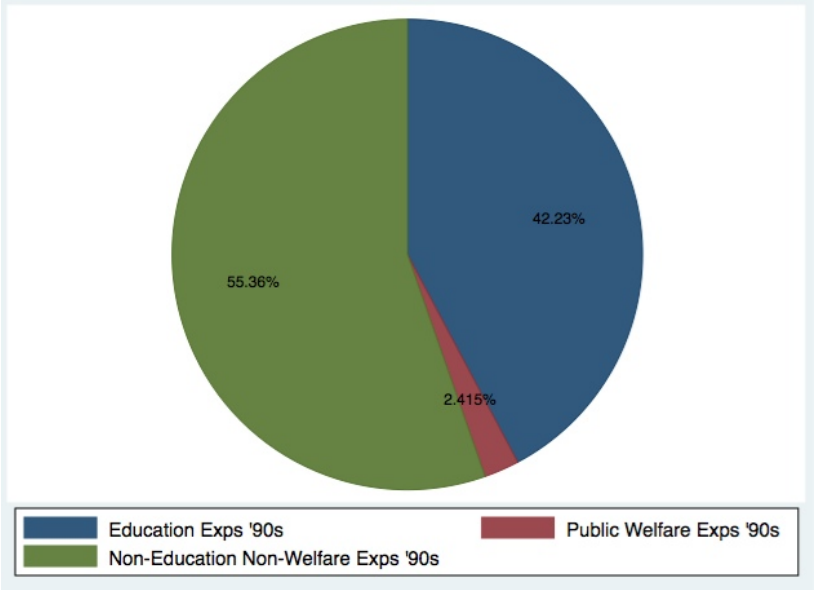


Figure 4 This pie chart shows the portion of mean expenditures that went to each of the three spending categories of the regression in Table 5 for the mean of the 1990's and 1980's. Expenditures are measured per capita.

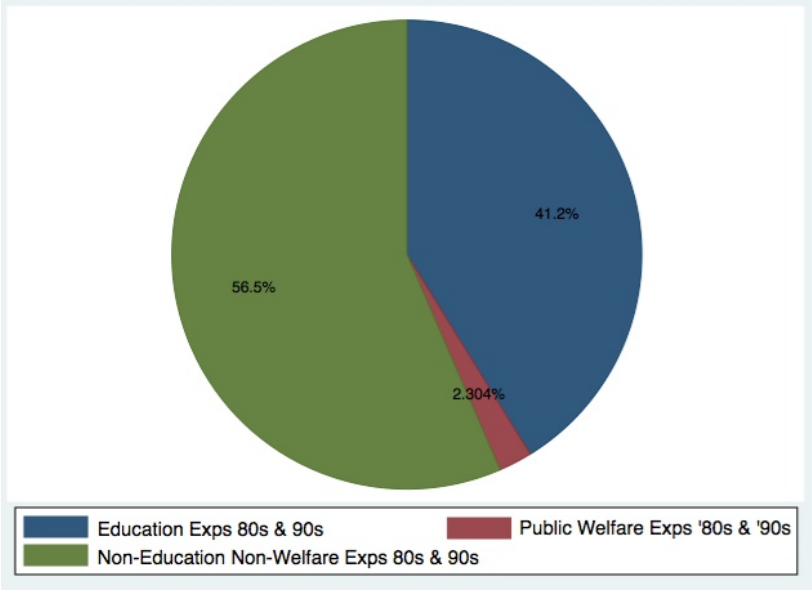
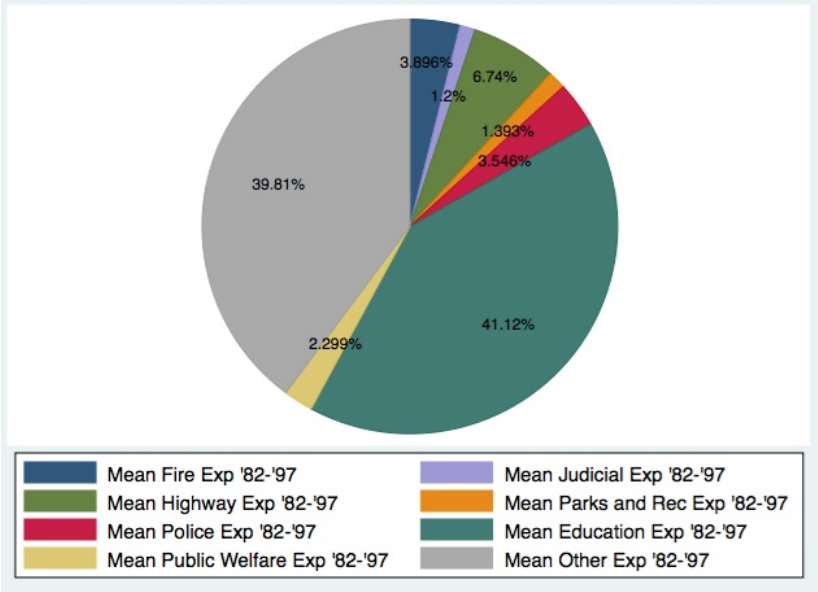


Figure 5 This pie chart shows the average amount spent on major spending categories relative to each other over the period from 1982 to 1997.



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