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Place, Preferences, and Policy: An Analysis of Funding Education Along the Urban-Rural Divide

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PLACE, PREFERENCES, AND POLICY: AN ANALYSIS OF FUNDING EDUCATION ALONG THE URBAN-RURAL DIVIDE

A Dissertation Presented

by

Kattalina Berriochoa

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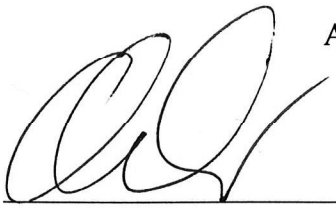

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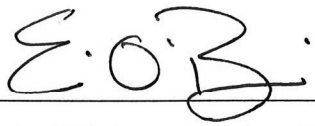

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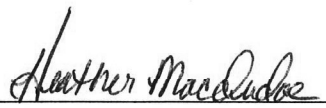

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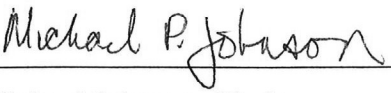

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ABSTRACT

PLACE, PREFERENCES, AND POLICY:
AN ANALYSIS OF FUNDING EDUCATION ALONG THE URBAN-RURAL DIVIDE

December 2019

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Rural places are changing in unique ways compared to urban and suburban areas. Rural residents disproportionately experience geographic isolation, tax base loss, decreasing populations, and economies challenged by industrial shifts and declines. This leaves rural areas with increasing need for public investment but does not necessarily translate into increased public demand for these investments. In this work, I analyze the following puzzle: what explains geographical variation in individual preferences, which often appears contrary to collective interests? Specifically, I analyze variation in investment preferences for public education and seek to build a better understanding of the underlying dynamics that explain why individuals across geography (urban versus rural) demand more or less funding for public schools. I contend that, apart from ideological differences compared to urban and suburban residents, unique and understudied factors are impacting collective decision-making in rural communities with a direct impact on public provisions. I approach this question through three research projects. In the first project, I analyze the determinants of tax preferences for public education comparing individuals who live in urban (metro) areas with those who live in rural (non-metro) areas. I find that there is a difference in the way that the low-income and middle-income in non-metro areas prefer education taxes compared to their metro counterparts. I also find that the belief

that local, rural schools are spending more than average reduces tax demand for education, yet the belief that these schools are performing on average increases this tax demand while this effect is opposite in urban areas. In the second project, I analyze the local calculation that drives individual preferences for increasing state spending on public education. I find that as county median income and local unemployment increases, the preference to increase education funding declines, but this does not vary by place. In the third project, I analyze local bond elections in Texas, with a focus on the urban and rural divide, finding that across all places an increase in non-white students and county median income are related to an increased probability of school bond passage. Overall, I find that the urban-rural divide is not a significant way to explain differences in preferences and voter behavior. The findings in this dissertation show that preference variation is mainly related to local economic conditions, educational attainment, investment comparisons across jurisdictions, and differences in local beneficiaries.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FIGURE page

CHAPTER 1

INTRODUCTION

1.1 Overview

Public education was tremendously impacted by the 2008 financial recession. As a result of the economic downturn, which increased unemployment and decreased property values, local education revenue collected through property taxes increased and, subsequently, inequality in school funding rose (Evans et al., 2019). One response to these school funding challenges was increased reliance on other taxes such as sales, property, and as a secondary course of action, supplemental bonds or levies. Consider the state of Idaho where supplemental levies became a fundamental source of financing public education. By the 2015-16 school year, over ninety districts in the state had passed supplemental levies, totaling $186.6 million in tax dollars (Richert, 2016). Rural districts were disproportionately affected by these changes in school funding. The small, rural districts in Idaho, which initially began to receive less funding around 2006, increased their reliance on supplemental levies, requiring local voter approval for passage. Among eighteen of these districts, eleven were able to pass an additional 2015 levy, while seven did not receive sufficient public support for passage (Richert, 2016). Underlying this example lies the impetus for this research.

Public schools remain a fundamental resource in communities throughout the US. However, in many cases, the public does not support an additional tax for their local public schools– particularly, in rural, small communities. This would appear counter-intuitive as improved public education is seemingly a form of mitigating economic downturns as well as a fundamental resource for the local community. This led to the following question: why is it that some communities, in particular small, rural communities, do not pass necessary supplemental funding

for their local schools? Is there something unique underlying the rural electorate, compared to the urban electorate, where supplemental bonds appear to pass more consistently? In my dissertation, I sought to analyze three main research questions. The first is the theoretical rationale for why a rural place, compared to an urban place, might vote against additional investment in public goods, specifically public education. The second is to empirically analyze if there is a fundamental difference in rural and urban places in their preferences for spending and taxes on public education. The third was to understand if the categories of rural, suburban, and urban (as well as metro and non-metro) are capturing underlying variation in public outcomes, specifically taxes and spending. Together, I analyze whether or not there is a difference in preferences across geography, if those differences explains preference variation, and what are the underlying determinants for those differences in preferences. To fully explore preference variation, I begin by considering the changing state of rural areas in the United States, contrasting these differences to urban areas

1.2 Understanding Rurality

Rural areas in the United States constitute roughly 72 percent of land, but is home to only an estimated 17 to 20 percent of the population. 'Rural' can mean many things; various industries, diverse people, and wide-ranging public needs. Yet, rural communities tend to share experiences when compared to their urban and suburban counterparts. Rural communities are characterized by a common set of challenges such as deep poverty, minimal job opportunities, and, compared to urban communities, lagging health care, educational attainment, and housing options (Browne, 2001; Brown and Swanson, 2004). Indeed, rural communities in the US have been characterized as "in decline and stagnant" for some time (Sharp and Parisi, 2003, pg. 357). In 2018, while the overall number of Americans living in distressed regions (a comparative measure of community economic well-being) declined, it continued to increase in rural zip codes (Fikri and Lettieri, 2018).

Many rural challenges have remained largely unaddressed for years, and often decades. National policy has sought to subsidize rural programs through redistributed tax contributions.

The Agricultural Adjustment Act, known as the Farm Bill, has shaped policy interventions in rural areas to approaches tied closely to factors within the agricultural economy. In contrast, trends toward devolution have shifted responsibility from national and state to local jurisdictions. This can pose serious problems for local governments to adequately fund and administer policies that effectively meet local needs (Sharp and Parisi, 2003). Cramer (2016) argues that the concept of *rural consciousness* is highlighted by a belief the rural places are overlooked by policy-makers and do not receive their fair share of resources. It could be that a feedback loop between the demand and supply of resources emerges in rural places, differently than urban and suburban areas, where inadequate resources impact public preferences and attitudes towards government provided goods. This raises the question of the relationship between public preferences and the allocation of public resources in rural communities.

Education finance is an essential piece of any local system of public goods. Compared to urban and suburban schools, rural schools tend to face specific challenges including inferior achievement, inadequate facilities,a high proportion of minority and low-income students, and a limited number of residents with advanced degrees (Beaulieu et al., 2003). The disparity in educational outcomes could be a result of a variety of factors. However, part of the lag in rural student achievement could be due to unequal school funding. For example, rural schools experience more financial constraint than urban schools as school funding formulas tend to favor quantities (not rates) of low-income schools and tax bases are weakened through distance, isolation, and population loss (Tieken, 2014). While per pupil expenditures are higher in rural areas, there are three main mechanisms that limit rural education systems differently than urban and suburban systems (Tennessee Educational Equity Coalition, 2019). The first is lower median household income in rural areas, which is directly linked to local property taxes and subsequently, to a school budget. The second is enrollment-based funding which means that provided services are limited by low-enrollment numbers or complicated through logistical factors, such as students spread out across districts. The third is teachers salaries, which tend to be less competitive compared to urban and suburban schools. Rural areas, where financial constraints impact educational achievement and opportunity, may inadvertently build public

preferences that further constrain adequate funding for schools. Local residents do not see the justification for increasing funding to public schools. This would appear contrary to need, as improved education contributes to overall economic development. While these public preferences might be tied to ideological determinants, I primarily explore how these preferences are potentially linked to local economic and social changes.

The idea that preferences for the amount and the way schools are funded is relevant because it is directly related to the educational opportunities and outcomes for rural youth and indirectly, to the overall health of the rural economy. This study will explore if tax preferences differ between rural, suburban, and urban communities. If this is the case, what contextual factors define differences based on place and how will these differences apply to current and potential policy approaches.

This research will further our understanding of the dynamics that drive individual demand for public goods across place. Lobao (2014) argues that economic and structural forces that impact rural communities present an opportunity for a clear study that considers the causal links between public action and communal outcomes. The focus on 'rural' will build on the literature that analyzes the importance of place in politics and the sense of the rural consciousness (Cramer, 2016). While Cramer (2016) focuses on explaining the politics of resentment, this dissertation intends to build on the idea that place matters in how individuals interpret political issues and how preferences translate into funding policy. Like Cramer (2016), this research will focus on the unique role that place plays in determining levels of redistribution for public schools. Following the rationale of Hochschild (1981), place impacts attitudes towards who gets what– reflecting a sense of fairness. "Geographic boundaries allow us to actually draw lines between types of people, particularly between the haves and have-nots" (Cramer, 2016, pg. 315). Furthermore, race and class are deeply intertwined into the politics of place. Thus, this dissertation will build on these past studies to further our understanding of the interaction between place, preferences, and policy.

1.3 Significance of Study

The idea that rural Americans go against their own interest has been circulating more frequently in popular discourse in recent years. Most rural areas are experiencing population decline whereas urban areas are experiencing consistent gains to population (Cromartie, 2016). Rural communities also experience higher rates of child poverty than that found in urban and suburban areas (United States Department of Agriculture, 2017). At the same time, rural parts of the country tend to be more conservative than their urban counterparts (Trubowitz, 2016), often leading to a higher likelihood of rejecting government interventions to address these issues.

Walsh (2012) argues that the notion that rural communities 'go against their own interest' is not fully explained by individual preferences in rural areas, rather notions for small government exist regardless of place. In the 2008 American National Election Survey (ANES), 34 percent of rural respondents agreed that the free market is better at solving problems [than government], compared to 31 percent of non-rural respondents. Furthermore, Walsh (2012) states that once we control income, age, race, gender, and party, these differences become statistically insignificant. This indicates that, while ideology is certainly playing a role in rural attitudes, there are other factors that are influencing the decision-making of rural communities, where public services tend to face different challenges than those in urban areas. While it may be possible that some factors such as ideology so strongly determine individual preferences that they express preferences that are objectively against their own self-interest, it is also possible that rural voters rationally express lower preferences for public spending, possibly because they have fewer abilities to bear the additional taxes associated with the increased spending. It could also be that rural individuals set their preferences based on economic factors, rather than social and cultural issues (Bartels, 2006; Ansolabehere et al., 2006). This indicates that income effects are more influential in setting public preferences (McCarty et al., 2006). The comparison between rural, suburban, and urban residents furthers our understanding of the role intervening structural and individual factors play in shaping preferences for public spending. The obvious question, as stated above, is whether preferences of rural voters are differentially

influenced by other factors such as demographic change and economic circumstances.

1.4 Defining 'Rural'

The term 'rural' is not easily defined but rather gives name to a wide array of place and people. Johnson (2013), for instance, argues that, "rural America is a deceptively simple term for a remarkably diverse collection of places." Within the social sciences, there are two primary approaches towards arriving at a definition of rural (Brown and Schafft, 2011). The first approach is based on geography or space, arguing that 'rurality' is multidimensional and relates to social, economic, and political factors in the places where people live and work. The second draws from the social construction tradition, emphasizing the symbols and signs that people associate with 'rurality.' This study will largely draw from the first definition of 'rural' as a geographical locality, based on the assumption that this definition best captures the local economic experience that underlies preference formation.

According to Kusmin (2016), counties that fall into the rural or non-metro classification constitute roughly 72 percent of landmass with approximately 46.2 million residents. Rural areas are spread out throughout the United States and consist of unique demographic, economic, and geographical characteristics. While these vary between rural places, the two main characteristics that define rural areas are geographical isolation and low population density. This study will follow the general trend of social scientists to define rural as locales with populations under 50,000, a determination of metropolitan and non-metropolitan districts (Cromartie and Bucholtz, 2008). However, the USDA provides further insight into rural areas. According to the Rural-Urban Continuum Codes, non-metropolitan counties are measured by degree of urbanization and adjacency to a metro area. Counties are assigned to one of nine codes. Figure1.1 displays these codes across all counties in the United States. Additionally, these codes can be collapsed into metropolitan and non-metropolitan distinctions. The first three codes create the metropolitan category. The remaining six codes, including urban and rural, create the non-metropolitan category. Figure1.2 displays these collapsed codes across all counties in the United States.

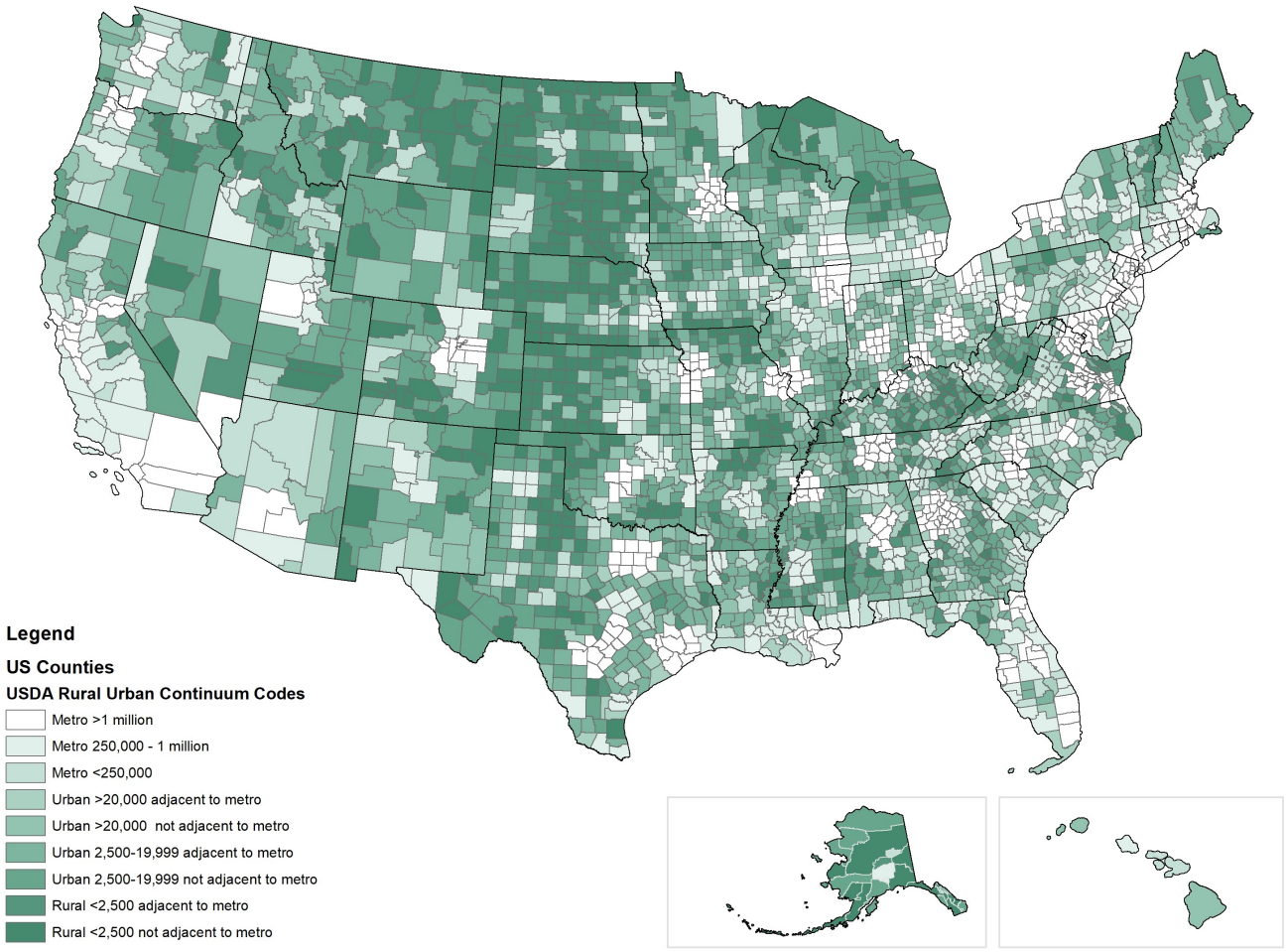

Figure 1.1: US Counties by Rural-Urban Continuum Codes (RUCC, 2013)

For this research, counties and school districts will be the main unit of analysis. Practically speaking, these boundaries are stable and historically used to measure locale-based research by the US Census, Economic Research Service of the USDA, and the US Office of Management and Budget (Johnson, 2013). The following sections will give a brief overview of the social, political, and economic characteristics that create links between rural locales in the United States.[1]

[1] All maps in this dissertation utilize the Census Bureau TIGER/Line shapefiles. These files are based on legal boundaries and draw over some areas, like the Great Lakes, with the counties that have jurisdiction over these areas. I am using these shapefiles because they accurately represent county coverage. However, arguably they do not provide the most accurate visual representation of the United States.

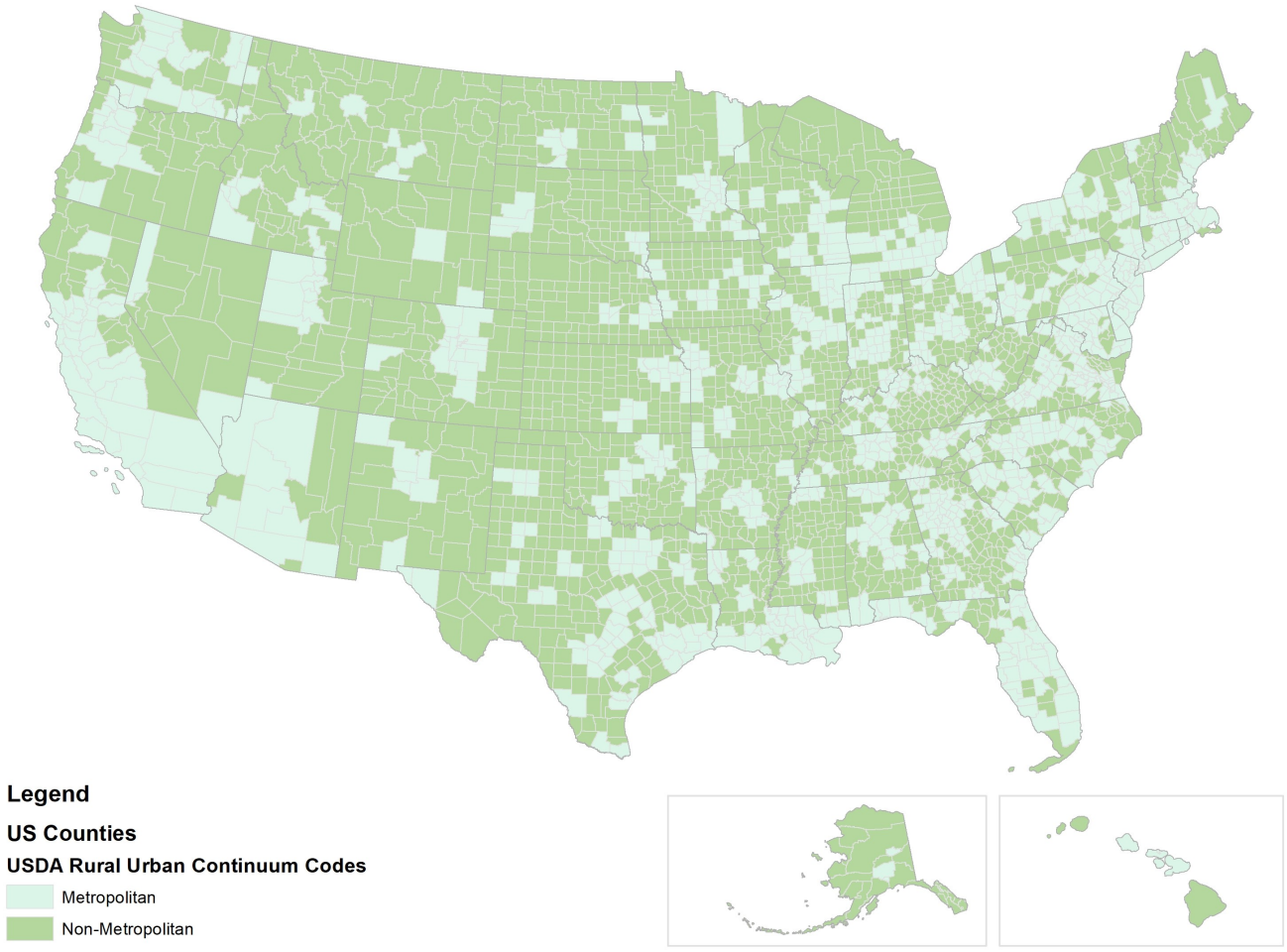

Figure 1.2: US Counties by Metropolitan/Non-Metropolitan Categories

1.4.1 Population

Population is a key determinant of rural locales. In general, rural American communities have struggled with population decline, compared to urban and suburban areas. It was only during the 1970s that non-metropolitan regions experienced population growth exceeding that of metropolitan areas (Johnson, 2013). It should be noted that this was a period of increasing natural resource extraction, brought on by the energy crisis, which shifted industry spurring rural growth (Lobao, 2014). However, general trends in population highlight a decline since this period. Across rural areas, population loss varies widely, with the most population loss occurring in the North- and Southeast and the most population growth in the Inland Northwest (Kusmin, 2016). However, even rural areas that experience population growth continue to lag behind their urban counterparts.

Population changes in rural locales are mainly characterized as out-migration, the phenomena in which more individuals leave than arrive or are born there (Johnson, 2013). On average, rural populations tend to be older than populations in other parts of the country (Johnson, 2013). The average age in rural America is 51 years, compared to 45 in urban areas (United State Census Bureau, 2016). Of these individuals, the percent that lives in the state of their birth is higher in rural areas (65.4 percent) than in urban areas (48.3 percent) (United State Census Bureau, 2016). These population trends reflect the migration patterns that are impacting the demographic makeup of rural America, compared to a growing population in urban areas. Apart from out-migration patterns, the birth rate is also declining in rural areas (Cromartie, 2017). Additionally, other contributions to low population trends are mortality rates which are increasing among working-age adults in rural areas and are intertwined with prescription medication abuse, especially opioids, and deaths related to heroin use (Cromartie, 2017). Finally, among the older rural population, they continue to experience disadvantages in terms of available services and experience a higher prevalence of chronic disease, higher disability rate, and lower prevalence of healthy behaviors (Skoufalos et al., 2017).

1.4.2 Poverty

The geography of poverty is complicated across the urban and rural divide. The Census Bureau recommends using the American Community Survey (ACS) over the Current Population Survey (CPS) due to sample size. Using the geographical definitions of metropolitan (city and suburbs) and non-metropolitan (small towns and rural areas) within the ACS dataset, the overall rate of poverty is slightly higher in non-metro counties (17.2 percent) than in metro counties (14.3 percent) (Farrigan et al., 2014). Furthermore, poverty rates vary drastically by region. According to the ACS data, the highest rates of poverty in non-metropolitan counties tend to be concentrated in the South. On average, the poverty rate is highest in the South (21.7 percent) and West (17.4 percent), compared to the Northeast (14 percent) and Midwest (14.9) (Farrigan et al., 2014). In 2018, while the overall number of Americans living in distressed regions (a composite measure of community economic well-being) declined, it continued to increase in rural zip codes (Fikri and Lettieri, 2018). After the 2008 recession, job growth and recovery was much slower in rural areas. Since 2005, rural wages and salaries have continued to lag those in urban employment sectors (Cromartie, 2017). Since 2007, the median income in rural areas has averaged 25 percent below the urban median income (Cromartie, 2017).

Two poverty rates impact school-aged children. The first is the poverty rate of children under the age of 18 and the second is the poverty rate of children under the age of 6. The rate of poverty under the age of 18 is higher in non-metropolitan areas than in metropolitan areas. For children aged 6-11, the non-metro poverty rate is 27 percent compared to 22 percent in metro areas (Farrigan et al., 2014). For children aged 12-17, the non-metro poverty rate is 24.5 percent compared to 20.2 percent in metro areas (Farrigan et al., 2014). In addition, children in non-metro areas are disproportionately impacted by deep poverty [2] (Farrigan et al., 2014). Compared to urban children, deep poverty is higher in non-metropolitan areas by approximately 2 percentage points across all youth categories. The rates of rural child poverty are consistent for children of all races and ethnic backgrounds compared to their urban coun-

[2]The deep poverty rate is defined as "a child's family with income less than half (under 0.50) of their poverty income threshold)" (United States Department of Agriculture, 2017).

terparts. Only 50 urban counties (4.3 percent of the all urban) compared to 300 rural counties (15.2 percent of all rural) are considered persistent poor. That is to say, a county with 20 percent or more of their populations living in poverty over approximately 30 years (Cromartie, 2017).

1.4.3 Race

In rural America, most residents are white, non-Hispanic (77.8 percent). Among the non-white, rural population, 8.2 percent are African-American, 9.3 percent are Hispanic, and 1.9 are Native American (Council, 2012). These groups tend to be highly concentrated in certain regions and communities, such as the South and Western United States. In the rural west, 99 percent of rural counties have seen growth in minority populations (Pohl, 2017). Due to the out-migration of young, working-age residents, population loss is common. However, among growing western rural states, 19 percent are expanding due only to minority population growth (Pohl, 2017). Effectively, the growth of minority populations are slowing the decline of rural places in the West. However, the concentration of ethnic groups in rural parts of the country tend to remain near institutions that subjugated minority groups, such as reservations, colonias, agribusiness, and states with a history of slavery and Jim Crow laws (Rural Sociological Society, 1993). In fact, persistent-poverty counties are mainly found in the South, comprising nearly 85 percent of all rural counties and 20 of southern rural counties (Cromartie, 2017). The presence of rural minorities in relation to historically oppressive institutions indicates the complexity of factors that remain and continue to constrain the development and social mobility of rural residents.

1.4.4 Education

Approximately one-third of public schools are in rural areas (Kena et al., 2016). Compared to cities, suburbs, and towns, students in rural areas are primarily white (71 percent) (Kena et al., 2016). In addition, the highest percentage of American Indian and Alaska Native students are located in rural areas and towns, compared to cities and suburbs (Kena et al., 2016). However, all racial and ethnic minorities in rural areas continue to lag behind white

counterparts in educational attainment. In 2015, the share of Black (24 percent), American Indian/Alaska Native (20 percent), and Hispanic or Latino (39 percent) students with less than a high school diploma continued to outweigh the rates of white (13 percent) students in rural parts of the country (Marré, 2017).

The percentage of students in rural areas attending high-poverty schools (10 percent) was lower than the national percentage (20 percent). However, more than half of all rural students are eligible for free and reduced meal rates in sixteen states (New Mexico, Louisiana, Mississippi, Oklahoma, Arkansas, Kentucky, Florida, California, South Carolina, Georgia, Alabama, Oregon, West Virginia, North Carolina, Tennessee and Idaho) (Johnson et al., 2014). The rural high school diploma rate is on average under 81 percent (Johnson et al., 2014). The gap between non-metropolitan and metropolitan areas increases in terms of college completion; the percentage of bachelor degrees in rural areas is 19.5 percent compared to urban areas with 29 percent (United State Census Bureau, 2016). Broadly speaking, as *rurality* increases, the percentage of rural adults with Bachelor degrees or higher decreases (Cromartie, 2017). Finally, rural educational attainment varies across demographic groups; rural women are more educated than rural men and rural whites are more educated than racial and ethnic minorities (Marré, 2017). Nearly four out of five of the counties (79 percent) deemed as "low education" by the USDA Economic Research Services are rural (Marré, 2017). Low educational attainment in rural places is closely related to higher poverty rates as well as higher unemployment rates and lower earnings.

1.4.5 Understanding Contemporary Rurality

Each of the outlined components (population, poverty, race, and education) provide some contextual understanding of the conditions that vary across rural communities. This is essential for understanding the macro- and micro-level factors that influence rural preferences throughout the US. This is due to two factors that are pertinent to the study of the rural condition, space and time. The first factor, space, underscores the relationship of rural locales to both urbanization and globalization. While geographically isolated, rural regions are intrinsically

connected to the industrial development in other parts of the country and the world. Economic forces, both nationally and internationally, have restructured work opportunities and educational payouts in rural regions. The second factor– time, highlights the institutional history that is essential in better understanding rural communities. While it may be simple to paint rural issues with a broad brush, it is imperative to analyze interplay between individuals and their communities to further our understanding of rural policy challenges.

The idea behind this dissertation is to understand the mechanisms that are differentially impacting rural areas compared to suburban and urban areas. For example, population loss in rural areas impacts the social and economic fabric of these societies. Those who leave rural areas have as much importance as those who stay. Education poses a conundrum to rural areas; more educated individuals tend to leave the countryside for the city. Carr and Kefalas (2009) state that this phenomenon is a zero-sum game, benefiting destination cities and hurting the areas where out-migration occurs. "In less than a generation, the Heartland's most valuable export was no longer its crops or hogs but its educated young people" Carr and Kefalas (2009). Just as the educated leave, those who stay continue to impact the design of public provisions in rural communities. In addition, studies have found that public education tends to suffer in areas where individuals have lower levels of educational achievement (Beaulieu et al., 2003). However, Mykerezi et al. (2014) found that no cognitive difference emerged between students in urban, suburban or rural areas. Rather, institutional factors such as limited resources for schools and migration for job availability serve as common challenges among rural communities (Gibbs, 2005; Mykerezi et al., 2014). Increased spending per student, particularly for limited English learners and difficulty in attracting qualified teachers incur greater costs for rural public schools (Imazeki and Reschovsky, 2003). Heavy reliance on property taxes, low educational rates in the community, and shifting economic opportunity create barriers to ensure that rural schools are adequate and equitable (Imazeki and Reschovsky, 2003; Jordan and Jordan, 2004). These studies beg the question of how local institutions can better serve the rural community and reap greater benefits from education.

1.5 Theoretical Explanations

Education is considered the machine of social mobility because of increased individual agency, improved employment, and the overall improvement of community well-being. Education is a byproduct of politics and society, with latter effects on both institutions. When individuals are deprived of education, their opportunity to improve their own life is diminished. Nussbaum and Sen (1993, p.31) argue that everyone has the right to build their own capability to achieve "valuable functioning". Education is a fundamental component of building capabilities and serves as a form of improving individual and collective well-being, agency, and quality of life (Nussbaum and Sen, 1993). In this context, education serves as the most valuable avenue for bringing individuals out of current conditions and building human capacity. In nearly all publications on rural places, the topic of education emerges as a central and important response to ensure more equitable development. This is because of the argument that education is the most effective way to ensure social mobility, economic opportunity, and individual growth. These factors are based on an argument that, through education, individuals can pull themselves out of current conditions and construct a more productive future for themselves. In effect, they build the social, human, and cultural capital necessary to overcome individual and structural barriers. However, rural communities continue to grapple with educational challenges.

This study contributes to the literature by entering the debate from the direction of public preferences and seeks to further our understanding of the interplay between individuals and institutions when it comes to funding rural schools. Typically, we consider finance to be a government function and overlook the role of public preferences in explaining the amount of funding dedicated to public institutions. Furthermore, this study challenges singular explanations of ideology, irrationality, or lack of knowledge to test the models of political economy that emphasize the interplay between individuals and institutions. Rational under-investment theory argues that individuals may not demand increased public finance for a good when the return on investment does not justify the cost (Rural Sociological Society, 1993). This theory extends Human Capital Theory to account for the structure of the economy and communal ben-

efits surrounding investment in public education. According to this theory, rural residents form opinions based on short-term and long-term factors that impact themselves and their community. An example of short-term factors includes changing tax burdens or personal experience in education. In contrast, long-term factors might include familial ties, migration effects, and job availability that impact preferences for spending. Three potential explanations emerge when we consider the relationship between public preferences and provisions within the notion of rational under-investment.

The first is that social mechanisms drive public preferences in rural places. Iterations of these mechanisms could include identity politics or anti-elite sentiments. In this case, public preferences are formed around ideological arguments or beliefs about who benefits from government interventions. This would reflect rural resentment towards contemporary public institutions (Cramer, 2016). Ideological arguments in rural areas- which tend to support anti-government approaches- could be driven by racial dynamics, classism, partisanship, or anti-elitism. The ideological preferences differentiate between those who should benefit and those who should pay into public services. Consider race in rural places, where historical legacies of "conflict and exclusion have led to a form of de facto racial segregation, and a range of economic and social disparities" (Brown and Schafft, 2011). This only adds to a sense of distributional injustice that rural areas are overlooked and where political divisions are rooted in a sense of us versus the elites (Cramer, 2016). Identity politics brought on by race or class distinctions could further create incentives for under-investment in public institutions.

The second potential explanation for under-investment in rural education is derived from political mechanisms. Rural policy, which has been historically synonymous with farm policy, could be failing rural areas by not responding to needs. This could be due to the political powers that dominate rural politics. Overlooking the industrial variation in rural places, public policy has historically benefited agricultural industries driven by farmers-first policy (Browne, 2001). This means that lawmakers are ineffective at passing policy to meet increasing social and economic needs in rural areas, outside farming, industry, and agriculture. Primary policy impacting rural areas is based on interest-group dynamics rather than through agents of

change seeking to reshape existing institutions and, subsequently, mass politics (Hansen, 1991; Browne, 2001).

The third explanation, and focus of this dissertation, is that citizens do not receive benefits from public services, such as education. In rural areas, this could be due to the notion that education is not a necessity for livelihood. Rural industry tends to demand low-skilled workers (Rural Sociological Society, 1993). Limited jobs mean that educated individuals will likely leave rural areas for employment opportunities, constraining incentives for community investment in education (Rural Sociological Society, 1993). This is an explanation based on labor-market mechanisms. Economic limitations, geographic distance from employment, and lack of jobs in rural areas lead to a negative return on investment in education when individuals move away for opportunities (Carr and Kefalas, 2009). Differentiation in the labor market leads to a self-selection phenomenon where those who value education leave and those who do not value education stay. Investment in education is hereafter constrained in rural area by individual preferences that account for short- and long-term consequences in human capital formation (Rural Sociological Society, 1993).

1.6 Conceptual Framework

This study analyzes the relationship between individuals and local economic institutions and conditions. This is due to the nature of rural areas where historical and current institutions continue to constrain or benefit the local community members. People do not make decisions in a vacuum. The combination of two overarching frameworks will provide the main conceptual approach to this study and provide factors, constructs, and key variables. In contrast, theory will serve as the lens for critically approaching this topic and determining the relationship between variables. Together, these frameworks will serve as a collection of the factors most relevant to understanding the phenomena of how individuals set spending preferences for public services.

The first conceptual framework is derived from the theory of structuration (Giddens, 1979, 1986). Structuration is the theoretical explanation of the conditions that govern the

continuity or transformation of structures (Giddens, 1979). This approach is born of the sociological tradition and stresses the importance of resources, power, and reciprocity between actors (social and structural). The basic notion of this theoretical approach is that institutions influence action by individuals in the same way that individuals influence institutions. According to this framework, there is a "mutual dependence between structure and agency" (Giddens, 1986, pg. 69). In addition, we must consider decision-making by paying close attention to space,such as geographical isolation and trends over time. An example would be an expected outcome based on current conditions. This framework provides a point of analysis for the reproduction of social outcomes, as well as the points in which change may occur (Giddens, 1979).

In conjunction with Giddens (1979, 1986), the framework of Ostrom (1999) known as the Institutional Analysis and Development (IAD) framework improves our understanding of the ways in which institutions operate and change over time. The main contribution of this framework is known as co-production, or the ways in which citizens (consumers in economic terms) participate in the production of public goods or services, such as education. Another important contribution of this framework is the main unit of analysis in which collective decision-making takes place, known as action arenas (Ostrom, 1999). Furthermore Ostrom (1999) outlines the three main factors that influence the action arena; physical and material conditions, general attributes of a community, and rules for appropriate procedure and interaction. This study will provide a detailed analysis on these attributes and their impact on rural collective decision-making.

The combination of these conceptual frameworks provides a multidimensional model of the interactions between individuals and institutions. Giddens provides the model with variables such as structure and agency whereas Ostrom provides a venue for decision-making, the action arena– in this research, defined as place. Ostrom offers a specification of the exogenous variables (materials, attributes, and rules) that influence the outcomes of collective decisions. Furthermore, these frameworks provide a broader understanding around the complex interactions driving local public economies. The interplay between structure and agency

at the collective and individual level work to either reproduce or change the policy outcomes impacting rural educational opportunities.

The conceptual framework provides us a way of thinking of the interaction of institutional and individual factors. From the institutional approach, investment in public education is a combination of the entities that combine resources and build capacity to provide this public service, i.e., the local economic conditions. From the individual approach, investment in public education is a combination of the individual perspective of social mobility and the relationship between the individual and their broader networks (family and community). There is interdependence between these two forces; public education is dependent on financial and institutional support which is a function of public support for this publicly-provided good.

Much of the rural literature continues to return to the same policy domain, public education, as a factor in understanding the historical and current state of rural places (Rural Sociological Society, 1993; Carr and Kefalas, 2009; Duncan, 2014; Cramer, 2016). Schafft and Biddle (2014) address the role of rural education as a form of rural development. The authors argue that the role of local social institutions, such as schools, play critical community roles yet face challenges of decreasing capacity. "Creating, retaining, and attracting well-educated Americans individuals... will be vital to the long-term social and economic health of rural areas" (Duncan, 2014, pg. 288). However, education funding itself continues to remain complicated in rural areas. Issues of taxation and distribution reflect a sense that "decisions about funding schools means that small communities are the victims of distributive justice" (Cramer, 2016, pg. 59). This sense of fairness may be directly linked to the distribution of power and resources for rural public schools.

1.7 Research Summary

In this dissertation, I analyze the following puzzle: what explains geographical variation in individual preferences, which often appear contrary to collective interests? Specifically, I analyze variation in investment preferences for public education and seek to build a better understanding of the underlying dynamics that explain why individuals across geography (urban

versus rural) demand more or less funding for public schools. I contend that, apart from ideological differences compared to urban and suburban residents, unique and understudied factors are impacting the collective decision-making in rural communities with a direct impact on the financing of public provisions. While I compare the preferences of urban, suburban, and rural residents, this research aims to highlight the unique dynamics that may drive variation in public goods investment across geography. I seek to highlight why a person living in a rural place may form a unique preference compared to their urban and suburban counterparts. I approach this question through three research projects. In the first project, I analyze the determinants of tax preferences for public education comparing individuals who live in urban (metro) areas with those who live in rural (non-metro) areas. In the second project, I analyze the local calculation that drives individual preferences for increasing state spending on public education. In the third project, I analyze local school bond elections in Texas, with a focus on the urban and rural divide. Overall, I find that the urban-rural divide is not a significant way to explain differences in preferences and voter behavior. The findings in this dissertation show that preference variation is mainly related to local economic conditions, educational attainment, investment comparisons across jurisdictions, and differences in local beneficiaries- factors which may transcend the categories of urban, suburban, and rural.

CHAPTER 2

INCREASING TAXES FOR SCHOOLS: DOES THE URBAN-RURAL DIVIDE EXPLAIN DIFFERENCES IN TAX PREFERENCES FOR PUBLIC EDUCATION?

2.1 Overview

For many governments, public education is one of the most costly goods provided to citizens. Among OECD countries, an average of 6.1 percent of GDP is spent on education with the United States spending roughly 6.9 percent of its GDP on education expenditures comprising both post-secondary and elementary-secondary levels (Kena et al., 2015). Nationally, this amounted to an estimated $1.2 trillion dollars for the 2013-2014 school year (Kena et al., 2015). To warrant the hefty cost of this good, it is argued that education plays a fundamental role for society and economies; serving as a justification for the treatment of education as a publicly-provided good, rather than through private markets. In society, the function of education ensures a trained and active labor force (Becker and Murphy, 1988). It also creates avenues for socialization in a democratic system (Woessmann, 2016; Glaeser et al., 2007). Underlying these objectives is the policy goal of equity where, both vertically and horizontally, citizens are provided with comparable opportunities and resources.

At the nexus of cost and objective is the debate of how to maintain the balance between efficiency and equity in the education systems of modern welfare states. This balance is further complicated as we move across geography where the experience of paying for and benefiting from public goods differs greatly. One way to categorize this geographic variation is the urban-rural divide. In this paper, I analyze how preferences for spending on schools (operationalized

as attitudes towards changing current taxation levels for public education) vary across urban (metropolitan) and rural (non-metropolitan) places, as well as the underlying determinants for this variation. While this study primarily analyzes education preference heterogeneity, a secondary analysis considers if a geographic divide captures this variation and how preferences may vary across place.

The objective of this research is to analyze the determinants of tax preferences for public education, specifically comparing individuals who live in more urban areas compared to those who live in more rural areas. Geography is one way to understand the variation in public education across the United States. To give the reader some context, in the US, education financing is closely related to the economic prosperity of the local community. While educational attainment varies across place, so do funding formulas for schools. For example, local property taxes, which directly impact public school funding, can vary greatly across place. Per pupil spending can vary between $8,000 a year to $16,000 a year between states, with further variation at the district level (Educational Finance Branch, 2015). The funding formula for public elementary-secondary school systems in the United States relies on approximately 65% of revenue from local sources, mainly generated through property taxes (Educational Finance Branch, 2015). This means that depending on where an individual lives, public education may be better or worse, in terms of funding. On average, 38.6% of all education revenue is sourced through local taxes, including property tax (Educational Finance Branch, 2015). However, this reliance on property taxes can vary greatly across geography, with the average in some states resulting in nearly 50% of funds generated through local taxes. Of course, property taxes impact property owners. Arguably, middle-income and upper-income people are more likely to own property and thus, pay the taxes.

These dynamics around education funding underscore two features that are analyzed in this paper: preferences by different income groups and geographical variation intersecting with these preferences. Discussions about funding for public education generally center on the legislative and governance processes. This analysis seeks to fill gaps in empirical research about education in terms of the political economy of redistribution, in particular individual prefer-

ences for redistributive spending on education. Public education funding is generated through redistributive taxes, where higher-income citizens or property owners subsidize lower-income citizens. Thus, income levels are key variables of analysis. First, I consider how falling into a certain income group could result in different preferences through a simple supply and demand model. In this model, I move away from national aggregation common in redistributive models to consider place-based variation, highlighting geographical variation. Specifically, this model explores shifting supply and demand variation across low, middle, and high-income groups in each *place* (urban, suburban, and rural). This model builds on the work of Ansell (2010). Second, due to funding formulas for American public education that may incur cost for one group while another benefits, individual attitudes towards inequality, fairness, and government are all relevant in understanding preferences. I include a battery of measures in each empirical analysis. These measures ask about spending and outcomes in relation to other jurisdictions such as preferences for which government level should control education and geographic inequality in resources and funding.

This research uses survey data from 2015 and 2016, administered through the Cooperative Congressional Election Survey (CCES) to analyze this variation in preferences for funding education across the geographic urban and rural divide. Three ordinal regression models are outlined in this paper. In the first model, the data from these surveys is pooled to analyze change over time in preferences for education over the urban and rural geographic divide. Two additional models separately analyze each survey wave, comparing place and tax preferences for public education. Further, to analyze the effect of redistribution and sentiments of fairness, these models also include questions about comparisons across schools districts, just distributions of education funds, and local governance concerns. These models represent the individual preference set determining the direction of education provisions, through increased or decreased taxes.

In this paper, I show that depending on where a person lives, their preference may vary based on relative income distributions at the local level. However, I also show that while a geographic divide is present, it also does not provide clear categories for the beliefs or pref-

erences of individuals in regard to public school taxes. First, I find a statistically significant difference in the way that the middle-income group in non-metro areas prefers education taxes compared to their middle-income counterparts in metro areas. In fact, they prefer to decrease taxes for public education. Second, beliefs matter for preferences for education taxes. The belief that local spending is more than average reduces demand for education (with the preference to decrease taxes). In contrast, the belief that local schools are performing better than average increases the demand for education (through increased taxes). There is no major difference between beliefs across geography except in one case. The belief by non-metro individuals that their schools are performing on average increases their preference for more education taxes, relative to their metro counterparts who prefer to decrease taxes based on this belief. In effect, the term average may have two different meanings with two different outcomes. Third, I find individuals across the United States prefer to increase taxes for local public education when they believe that unequal resources and not enough funding are problematic. On the contrary, the belief that the Federal government is a problem in public education is associated with a preference to decrease taxes. However, there is no statistical difference in these beliefs across the place-based categories. These findings, contrary to the model extension, find that beliefs (often associated with ideological leanings, but not necessarily) are not shaped by place in different ways. In this regard, individuals, regardless of place, are more alike than different.

Finally, I find that living in a rural area over time boosts individual preferences to increase taxes for public education more than living in an urban area. These findings indicate that national political preferences may differ from local preferences regarding public goods. In fact, local preferences for public goods differ between metro and non-metro areas based on school performance (being an *average* school). While this study is useful for considering heterogeneous preferences around public schooling in the United States, my findings suggest that place matters to a degree, but beliefs about problems, perceptions of performance, and inter-jurisdictional comparisons may better define the differences among individual calculations for setting tax preferences in relation to local public schools.

2.2 Literature

Public education, a driver of social mobility, is a form of social welfare policy that ensures human capital development for a nation‘s future labor supply. According to Becker (1964, 1994), education and training are the most important forms of human capital development. In a sense, education is a form of social insurance for a future of competitive economic activity, sufficiently trained workforce, and individual human development. Furthermore, education is a form of income redistribution and inter-generational social mobility (Hanushek et al., 2003; Bernasconi and Profeta, 2012). Public education is justified as a social investment based on the rate of return back into society. Society pays upfront costs for young people to become educated, and eventually, find gainful employment and become productive members of society. However, this means that those who *consume* education are not the main financiers of this good (De Fraja, 2004a). Rather, it is a joint venture for parents, families, and the state. The public financing of education is an inter-generational loan intended to generate human capital accumulation (Becker and Murphy, 1988).

According to the theory of human capital development, society chooses a level of education that maximizes the discounted value of wealth and the outcome of future earnings. At the collective level is redistribution for education, in which policy mechanisms enable the transfer of income from older to younger generations-— all with the underlying agreement that this initial payout will secure a future return on investment. Should opportunities to form learning abilities be missed by a community, this could lead to costly remediation to ensure skill formation (Heckman and Carneiro, 2003). If this is the case, it would be better for communities to finance schools in the present rather than spend more in the future for remediation. Primary education, financed through income redistribution, illustrates the highest private returns to the individual (Psacharopoulos and Patrinos, 2018).

Preferences and redistribution are often interrelated in the literature— normally within the context of the welfare state. Naturally, understanding preferences for redistribution is imperative for understanding preferences for public spending. Following this argument, to understand how individuals prefer government spending, we must take into account how they

think about redistribution. Studies about preferences for redistribution continue to map the complex process of human thought. Alesina and Giuliano (2011) find that preferences are determined by personal characteristics such as age, gender, race and socioeconomic level, in addition to the political ideology and perception of fairness. Many studies also show that the notions of fairness, altruism, and reciprocity motivate preferences for public policy (Fehr and Schmidt, 2001). Lewinsohn-Zamir (1998) finds that preferences for public goods, compared to private goods, are more altruistic than self-interested. However, this sense of otherness is compromised by an understanding of the limits of collective action and outcomes. In this case, program donors (taxpayers) care about who benefits. Alesina and Giuliano (2011) argue that individual perceptions of fairness in the process of mobility impacts attitudes towards redistribution.

Immigration rates and perceptions of outcomes have also been found to influence preferences. Emmenegger and Klemmensen (2013) analyze the relationship between redistribution and immigration, finding that individual motivation (self-interest versus humanitarianism, for example) moderates the tension between these two concepts. However, another strand of the literature focuses on the macro-level, institutional factors as determinants for social preferences. Jakobsen (2009) finds that trust in public institutions will hold opinions in-line with current policies and support the values upon which state institutions are founded. Busemeyer (2013) shows that the institutional structure of education (share public versus private) is associated with individual support for redistribution. As financing for private education increases, support for redistribution decreases. Individual level support is a function of individual income and of the institutional arrangement of education governance.

Fladmoe (2012) argues that social democratic policies create a feedback look into public opinion and perceptions of the system itself. In other developed countries, education funding is a non-controversial issue due to its management by technocrats and international recognition as an effective system. In contrast, Reed (2001) finds that attitudes towards equality and taxation play fundamental roles in public opinion around education in the United States. Attitudes towards education are linked to localist sentiments, which is driven by funding inequalities due

to variation in property tax bases. Along these same lines, Klugman et al. (2011) finds that clear cleavages exist among support for education policies based on socio-economic factors. Thus, education policy should also be studied outside schools through analyzing the political and social processes that shape opportunities and subsequently, opinions by the public.

Place allows for variation among policy preferences which can be further analyzed in terms of unique demographic, economic, social, and political factors. Authors have argued that the urban-rural divide, also known as the urban-rural interface, provides context for an emerging *sense of place* (Wulfhorst et al., 2006). In this sense, place is not only where one resides, but also where one finds attachment and identity is formed. Masuda and Garvin (2008) argue that the politics of place are formed through unique social and community dynamics. Kemmis (1992) asserted that the politics of place is defined as the way in which politics is situated in both landscape and locality. The role of group consciousness, or identification in a social grouping, is a central notion in understanding distributive equality (Walsh, 2012; Duncan, 2014). Group identity could manifest in a variety of ways, with one of those being spatially defined as *place*. Place-based consciousness has multiple defining characteristics. Two key characteristics, adapted from Walsh (2012) drive the motivation behind this research. First, place-based identification directly relates to perceptions of redistributive injustice and second, this sense of injustice is a perception of deprivation relative to other groups. Cramer (2016) argues that rural consciousness is derived from social class, in which perceptions of having less, drives attitudes towards public institutions such as education.

The relationship between preferences and place are illustrated when we consider the functional mechanisms of education. The returns to individuals based on their educational investment are crucial in understanding public provision preference levels across place. The basic mechanism is simple: if rural people experience lower returns to education, then they will likely demand less education funding. Clearly, the same could be true for urban and suburban people. The next question is why would the returns to education vary across place. Card and Krueger (1992) find that variation in the rate of return to education is substantial across states and time, mainly as a function of differing quality to schooling across geography leading to

differences in local education opportunities and outcomes.

Returns to education can take on a variety of forms. In the sociology and economics literature, the value of education is captured as a factor promoting economic growth (Krueger and Lindahl, 2001), reducing criminal behavior to ensure larger social cost-savings (Lochner and Moretti, 2004), and increasing democratic participation (Acemoglu et al., 2005; Bobba and Coviello, 2007). It is also argued that public education increases social welfare through improved social interactions (Lange and Topel, 2006). Generally, this rate of return is calculated through exogenous differences in the the return of education, where the cost borne to society results in collective net benefits. Another strand of the literature focuses on individual wages and earnings in capturing the endogenous return on education (Card, 2012). Underlying these functional forms of education is choice. The idea that individuals choose more or less education. In principle, it is easier to understand the intuition around this choice when considering higher education (which has a private cost and directly relates to immediate lost earnings). In consideration of primary and secondary education, the relationship between the factors that capture the return to education are more confounding.

Aside from economic considerations, there are political elements that factor into individual preferences for education. While the basic argument for public education rests on social mobility through increased productivity and higher wages, the reproduction of inequality is an additional consideration (Brown and Saks, 1977). Bowles and Gintis (1977) analyze the social reproduction of inequality perpetuated through education systems. The authors argue that by means of unequal educational opportunity, economic disadvantage becomes inter-generational. This assertion moves away from the purely functionalist approach that schooling provides skills useful in the labor market and life, in general. Rather, schools function as a form of socialization into labor-market stratification, where students are bound for certain roles in society (Raudenbush and Eschmann, 2015). As education has moved away from differentiated tracks into homogeneous skill-formation (seeking to remedy institutional inequality), there has been an increased tendency to hold schools accountable for producing a common skill-set based mainly in cognitive skills (Murnane et al., 1995; Cohen and Moffitt, 2010). The aims of education have

shifted from providing skills in accordance with an individual's future labor prospects to training individuals from all backgrounds with skills that encompass all labor-market industries. In effect, the idea of social inequality in education has changed from unequal opportunity to unequal outcomes. While the role of schools serves as an equalizing force, the capacity to benefit from instruction is determined by the current skills of each pupil, a factor that varies based on initial socioeconomic status (Raudenbush and Eschmann, 2015). As students enter educational institutions with varying levels of home-based instruction, schools can shift to an unequal force that benefits high socio-economic status students more than their low socio-economic counterparts. Thus, it could be that places with concentrated low- and middle-income groups (namely, rural and urban areas) accurately understand the inherent inequality in education and are discouraged from investing more in this public institution.

Finally, it could be that individuals in certain places demand less education because there is less opportunity. In this case, education may create a negative externality, that results in a loss of educated individuals. The negative impact of this migration would be more salient in rural areas, where population loss has negative economic and social impacts. Carr and Kefalas (2009) argue that rural brain drain can be driven by lack of local opportunity, such as skilled jobs with competitive wages. Vazzana and Rudi-Polloshka (2019) utilize survey data to analyze factors in outward migration from rural Appalachia. The data showed that the greatest determinant was the likelihood of finding employment with a corresponding salary, opportunity for advancement, and challenging/interesting work. Local opportunities and negative externalities, resulting in a cost by the community, are inextricably linked in this regard.

This paper seeks to illustrate the relationship between individual and economic factors with revealed preferences for tax rates. Two considerations should be outlined. First, primary and secondary education in the United States is legislated. That is, families can opt out of public education for private or parochial substitutes. Choice is relevant in this regard, but not restrictive. Individuals may move or prefer substitutes, but still hold a preference for how much money should be spent on public schools in their immediate area. Second, primary and secondary education is funded through formulas, meaning that individuals cannot necessarily

calculate the cost of education that is directly based on their tax contributions. To overcome the causal concerns with individual knowledge of education taxes, respondents are only asked to increase, decrease, or keep taxes the same. The wording of this question follows the rationale of Bergstrom et al. (1982). This may result in more or less individual burden, but the key relationship is that which exists between the individual community member (living in various places) and their preference for public school provisions. More importantly, is this calculation more closely correlated to individual benefit or collective outcomes? Finally, how does this calculation change when we consider variation in geography described as the urban-rural divide?

2.3 Education Supply and Demand Model

In this section, I add onto a simple model of education supply and demand. The original model is based on the work of Ansell (2010) in modeling the expansion of education through redistributive spending. In this model, individuals rationally decide whether they prefer more public education, in other words, increased public spending. In the original model, demand for education is based on grouping citizens into income groups (high, middle, and low). This is important for understanding aggregate demand for redistributive spending. These models typically find that the supply of education is mainly subsidized by high income. For middle-income groups, education is increasingly demanded because this group benefits from economic and labor mobility. The poor also demand education mainly for the benefit of positive externalities generated through expanded public education. A simplified version of the model by Ansell (2010) is included in Appendix A.

This model provides us with a starting point for considering variation in preferences for education. Based on the findings of this model, the middle-class should be persistent champions of expanding education. Arguably, it would be irrational to have a group that benefits from public education to voice a demand resulting in *less* expansion of government in the provision of public education. The following section analyzes a few modifications to this model that provide insights into shifting preferences for education as well as geographic variation.

2.3.1 Modeling Place-Based Preferences for Redistribution

In the original model, it is argued that externalities remain purely positive. The impact of the provision of education on income in period one is a function of which income group an individual initially falls into (in period zero). Thus, the model further distinguishes between the three main income groups (high, middle, and low). The impact of education provisions on high-income earners is largely a net negative for this group. Expanding education for this group results in high taxes and negative impact. This is mainly due to the decreasing premium on skilled labor, resulting from an increasing proportion of the population that now falls into this labor segment. In contrast, we find that middle-income families largely benefit from the expansion of education. As this group moves from unskilled to skilled labor, we find that they experience an increase in income. For the middle-income, the benefit from education expansion (potentially moving this group into skilled labor) in period one is a net benefit. Finally, we find that the low-income additionally benefit from increased spending on education, regardless of their lack of movement out of the unskilled labor. Ansell (2010) argues that even if this group does not receive education, they benefit from the positive externalities collectively generated through better local schools.

Working off this original model, I outline the underlying rationale for why an individual who benefits from government would oppose expanding this public good. I alter the model slightly to consider decentralized finance (the US funding formula split between national, state, and local sources) as a factor in driving preferences. As in the original model, I focus on the role of political institutions and labor market structures on the preferences of groups to target redistribution. Individuals choose to expand education through jurisdictional taxation rates. To build on the idea of progressive tax policy, we must understand *relative* wealth rather than *absolute* wealth as well as *relative* income distributions rather than *absolute* distributions.

In a decentralized system, public education is funded through a formula of local, state, and federal taxes– with the bulk of education finance relying on local and state taxes. Thus, I build an extension to the original model taking into account the local nature and impact of decentralization on public preferences. The goal of this extension is to examine preference

heterogeneity among individuals based in place. Furthermore, this extension considers the local-level distribution of income. These considerations provide some insight into why individuals in certain places may demand (and subsequently, invest) more or less in public education, notwithstanding the benefits of education on the local community. The extension of this model asserts that preferences for education are endogenous, meaning that preferences are affected by an individual's response resulting from external factors. I argue that these factors are place-based, rooted in the location where an individual lives and works. This drives their calculation for how much public education is valued. I extend the model to account for this variation in terms of taxation. Variation at the local level will provide some insight into heterogeneous preferences for education expansion and provide insight into why preferences may contradict objective economic and social outcomes from greater investment in public education.

The total cost of education will no longer be a function of national average income, but rather the average income of each jurisdiction. This change means that tax rates will shift across place. Generally, average and median incomes remain lower in rural or non-metropolitan areas compared to urban or metropolitan areas. Additionally, earnings for the same educational attainment is lower in rural areas compared to urban areas (Marré, 2017). Variation among places would lead to differentiation in preferences for public education provisions.

First, we need to consider the impact of wealth distribution within *place*. While being low-income might be comparable to somewhere between urban and rural places, being high-income in each place is a distinct experience. The high end of the distribution in rural areas may fall somewhere in the upper-middle distribution when compared to urban areas. This would mean that being in the middle-income group would have a very different local standing, depending on the place. For the middle-income group (at the aggregate level) they now experience the ceiling to income in a rural place. This would indicate that, like the high-income group at the national level, the middle-income in rural areas are now faced with the lion's share of tax burden, in addition to decreased productivity due to global integration of markets and skilled labor.

Externalities are now also generated at the local level. Should these externalities be neg-

ative, for example due to the migration of children to more skilled labor markets, many of the benefits in the previous model diminish. This would mean that the middle-class are now rationally voicing less demand for expanded education; a phenomenon that could be categorized as rational under-investment. Rational under-investment theory extends Human Capital Theory to account for the structure of the economy and communal outcomes from investing in public goods, such as education (Rural Sociological Society, 1993). According to this theory, individual opinions are driven by economic factors that impact themselves and their community. In the consideration of place-based variation, rational under-investment would mainly be a middle-class, rural or non-metropolitan phenomenon.

2.3.1.1 Relative Income

Place-based variation is the key to understanding a shift in preferences moving over geography. The impact on the political demands of individuals is a condition of individual and place-based considerations. In some places, it could be that the high-income groups have a larger role in determining the depth and expansion of education. However, when we analyze heterogeneity, it is necessary to understand the relative standing of individuals within the jurisdiction of taxation. Thus, the first implication of this extension is that the utility function of an individual can shift due to relative (rather than absolute) economic standing. Figure 2.1 displays the distribution of income between metro and non-metro residents among the 2015 survey respondents. From these distributions, there is notable clustering around the middle-income in the non-metro sample compared to the metro sample. In fact, the metro sample has a much longer distribution on family incomes that extend into the highest income. The comparison on distributions of income provides some insight into how being middle-to high-income in a non-metro place might be a different experience in terms of social burden relative to those in a metro place.

Place-based variation means that preferences are endogenous and driven by relative income distributions and local effects. Consider income distributions, which vary across place. Being middle-class in one place could result in very different preferences when compared to

being middle-class in another place. Table 2.1 outlines these shifts across place. Now, we find that demand for education is a function of relative income depending on where one lives. This implies that individuals with the same income, across place, would value education differently. Preferences are directly related to local conditions, meaning that an individual could relocate to another place and their preferences could shift. However, I argue that the main factors influencing the individual response to their external environment are mainly, the local distribution of income, local opportunity, and existing geographical variation in education.

The first implication of this model is that demand by income groups can shift across place. Figure 2.2 displays the distribution of income between metro and non-metro residents among the 2016 survey respondents. We find a similar distribution to that within the 2015 survey respondents. Again, there is notable clustering around the middle-income in the non-metro sample compared to the metro sample. The metro sample in this survey group also has a much longer distribution on family incomes that extend into the highest income. Comparing these frequency graphs allows us to reflect on the local-level distribution of income, which would vary across place. While there is a notably larger portion of the population in the metro sample at the high end of the distribution to bear the burden of public education taxes,the same is not true for the non-metro residents. In fact, the high-end of this distribution clusters around the low- and middle-income. These distributions of income indicate that the burden of public provisions in non-metro areas is borne by other segments of the population, primarily the local middle-class. According to the model outlined above and contrary to aggregate models of redistribution preferences, the consideration of relative income distribution could drive down the demand for education from those who seemingly benefit most from its expansion– primarily, the non-metro, middle class.

2.3.1.2 Local Opportunity

In addition, the consideration of return on investment from education is now complicated by place-based variation. The original specification of this model assumes only positive externalities. However, it is likely that negative externalities could also result from expanded educa-

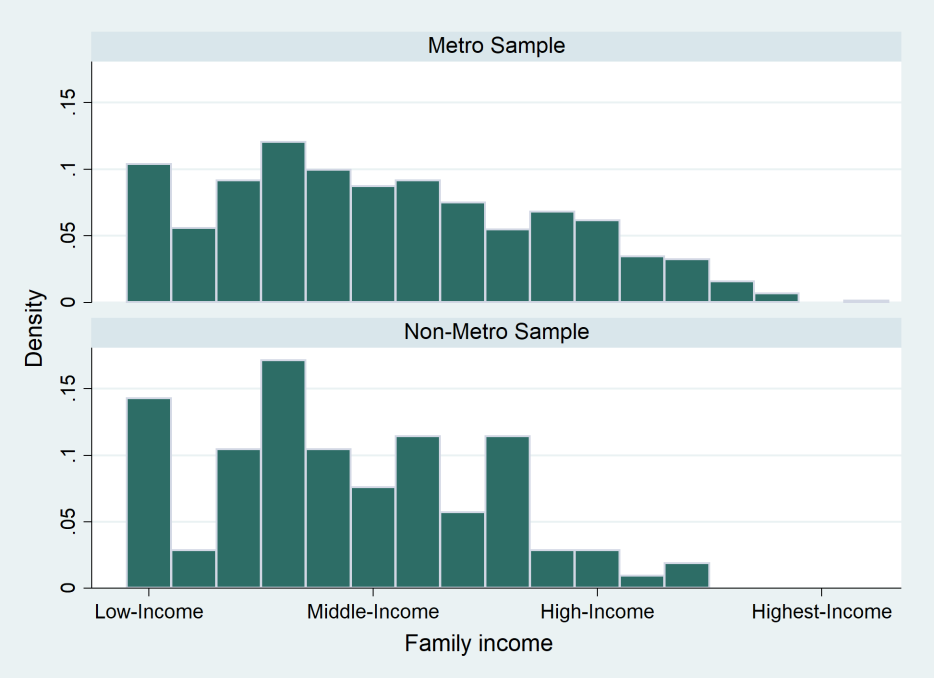

Figure 2.1: Distribution of Income Metro versus Non-Metro Residents (2015 Survey)

Figure 2.2: Distribution of Income Metro versus Non-Metro Residents (2016 Survey)

tion, primarily in rural areas. Consider a rural or non-metropolitan place in the United States. Unskilled labor remains the largest segment of the labor market. However, the economic outcomes from this labor segment are affected by globalization, where markets become more international and many industries move employment to other locations due to lower production costs. In an urban or metropolitan space, globalization has not driven down the premium on labor to the same degree as in rural or non-metropolitan areas. Thus, education expansion in a rural or non-metropolitan areas likely leads to outward migration. This outward migration to benefit from skilled labor markets is clearly reflecting social mobility. However, negative externalities are experienced by those left behind (as well as those who are deciding whether to expand education at the local level).

I claim that for the parents of educated individuals, expanding education results in a loss of the physical presence of family. Family ties, especially in rural areas, provide important social benefits. First, rural areas tend to be mainly populated by older individuals, where elderly care becomes more important and less common (Marré, 2017). Families, specifically children, often provide this care. For residents without children, the return on investment from expanding education just migrated to more lucrative labor markets. Second, the outward migration of educated individuals from rural areas creates a self-selection issue. Those left behind, employed in the unskilled labor segment characterized by stagnant wages, are not benefiting from the expansion of education. Positive externalities are not so clear, due to the outward migration of the educated. Further, it would be rational for this group to underestimate the benefits generated by education based on the mixed individual and collective local experience. The second implication of this model is that demand by individuals, across place, will reflect local opportunity and potential negative externalities.

2.3.1.3 Fairness Across Jurisdiction

Preferences are no longer based on aggregate redistribution but are now a function of local redistribution. Decentralized public provisions create a patchwork system of public goods. An individual may set their preference level not only based on the local economic and social

effects of education spending, but also based on cross-jurisdictional estimations. The consideration of spending across jurisdictions may provide a baseline for individuals to estimate what they think is appropriate or sufficient spending on goods. Additionally, individuals can compare the performance of goods across jurisdictions. This means that individuals are in a situation where preferences are subject to local level effects and the comparative effects of adjacent jurisdictional funding and outcomes can be observed. A taxpayer may not want to pay more if they are are already paying more than adjacent districts or if their schools are performing worse than adjacent districts. This would result in some sense of fairness or inequality based on comparisons across places. Fairness, a function of comparing spending and quality of goods across districts, will influence an individual preference for spending on their local public schools. Thus, the relative demand of education may highlight a sense of fairness as well as a comparison across jurisdictions in regards to taxation in a decentralized system.

In this model, the observation of benefits in the adjacent jurisdiction would drive preferences in your own jurisdiction. This modification is about the efficiency of taxation compared to other tax rates; the perception that payment and outcomes are relative to what others around you are paying and experiencing. The relative demand of education would shift the preference to the individual (as a taxpayer and a voter) to equalize funding or outcomes across jurisdiction. In sum, local taxation relative to adjacent jurisdictions will shift the demand for education based on the perceptions of unequal spending. However, this could be remedied through a shift to centralized taxation schemes– a return to the flat tax model of Ansell (2010). The third implication of this model is that demand by individuals, across place, will reflect relative and comparative public education spending, outcomes, and governance.

2.3.1.4 Place As a Factor

There a few key insights based on this model extension. First, place matters in determining tax preferences. Individual preferences are shaped by local-level factors. When we consider education taxes, individuals are effectively determining if the local benefit is worth the local cost. This would mean that individuals are driven by observations of the economic and social

shifts around them. Individual and aggregate education rates, levels of poverty and employment, local distribution of income and migration rates into the jurisdiction would determine a preference for taxes intended to fund public education. In addition, perceptions of fairness in resource allocation and education outcomes relative to other districts would shift demand for more or less education funding. Second, outcomes are not only a function of individual experience, but draw on collective outcomes. This means that, while education is generally positive for society, negative externalities can impact individual utility functions. A parent not demanding more public education may be counter-intuitive, but this preference could reflect rational under-investment in public goods that derive from local economic outcomes and social shifts. While this phenomenon may be less likely in densely populated areas due to private substitutes and economies of scale, individuals in less densely populated areas could express a form of rational underinvestment that manifests itself outside of ideology. Table 2.1 outlines how preferences may shift between place as we move across the urban-rural divide.

Table 2.1: Political Demand for Education Across Class and Place

Class	Urban (Metro)	Suburban	Rural (Non-Metro)
High	Negative	Negative	Negative
Middle	Positive	Positive	Negative
Low	Positive	Positive	Positive

2.4 Analysis

The empirical models presented in this paper are an approach to understanding heterogeneity in preferences across place. In this section, I run a series of ordered logit regression models to analyze variation across place. Data for this study is from the Cooperative Congressional Election Study (CCES). Two waves of survey questions were administered in 2015 (sample=1000) and 2016 (sample=1500). Figure 2.3 spatially displays the location of 2015 survey respondents. Figure 2.4 spatially displays the location of 2016 survey respondents. In the modules, survey questions focused on the attitudes towards public education, including

funding preferences and the perceived impact of federalism on public education. Using zip codes, respondents were then matched to county-level economic and social variables.

County-level data includes measures of poverty, population, education, and race. Poverty estimates are model-based estimates from the U.S. Census Bureau's Small Area Income and Poverty Estimate (SAIPE) program. Population estimates were collected from the U.S. Census Bureau County Population Estimates. County unemployment rates are from the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics (LAUS) program and median households are from the U.S. Census Bureau's Small Area Income and Poverty Estimate (SAIPE) program. Education data is collected from the U.S. Census Bureau and the decennial Censuses of Population as well as the Census Bureau's American Community Survey. Economic variables are lagged for one year prior to the survey.

The notion of *place* can be complex. For this study, I approach the rural definition in two ways. First, I utilize the United States Department of Agriculture Rural-Urban Continuum Codes for 2013. This format defines non-metro and metro counties based on a few parameters, including the main economic industry and population density. The estimated rural/non-metro population in the United States is between 17 and 20 percent. Table 2.2 provides descriptive statistics for each survey sample based on the Rural-Urban Continuum codes. This first definition is used in the two empirical models that analyze separate survey datasets. The second definition of place mainly relies on population density. To construct this measure, respondents in counties with 20,000 people or less are considered rural compared to counties with over 20,000 people being considered urban. This definition is used in the empirical model using combined data, which is specified by pooling the data from both surveys.

For each empirical analysis, the dependent variable is a measure of tax preferences for public education. Survey respondents are asked, "Would you vote to increase taxes for public school funding, decrease taxes for public school funding, or keep taxes for public school funding the same?" This variable serves as a proxy for an individual's preference of the public provision of spending on public education. Welch (1985) argues that preferences for taxes are a concrete expression of willingness to pay or expand services. Following this rationale, Buse-

Table 2.2: Descriptive Overview of 2015 & 2016 CCES Survey Respondents by Place

2015 Survey

Respondents by Place	Frequency	Percent	Cumulative
Metro (Urban Code 1,2,3)	829	82.9	82.9
Non-metro (Rural Code, 4,5,6,7,8,9)	171	17.1	100.00
Total	1,000	1,000	

2016 Survey

Respondents by Place	Frequency	Percent	Cumulative
Metro (Urban Code 1,2,3)	1,056	86.0	86.0
Non-metro (Rural Code, 4,5,6,7,8,9)	172	14.0	100.00
Total	1,228	1,228	

meyer et al. (2018) asks respondents about their willingness to pay additional taxes in order to measure their preference for financial investment in education. Due to the nature of the dependent variable (preference moving from decreasing to increasing taxes), each regression will be an ordered logit analysis. Coefficients are ordered log-odds estimates, which can be interpreted as a one unit increase that will result in the predicted coefficient change in the outcome variable, holding all other variables in the model constant. Table 2.3 provides descriptive statistics for the dependent variable of each survey.

2.4.1 Empirical Setup

The empirical strategy analyzes the individual and collective determinants for education finance preferences. Each model of the individual survey data is run with place as a dummy variable in the model (metro=0 and non-metro=1) and then runs each model with separate metro and non-metro samples. An obvious limitation of this approach is the sample size of the non-metropolitan respondents, roughly 17 percent of the overall samples. However, this approach gives us a baseline understanding of variation in political determinants for the expansion of education. The final model pools the data together to allow for an analysis of variation over time. The following regression tables display parameter estimates and measures of fit

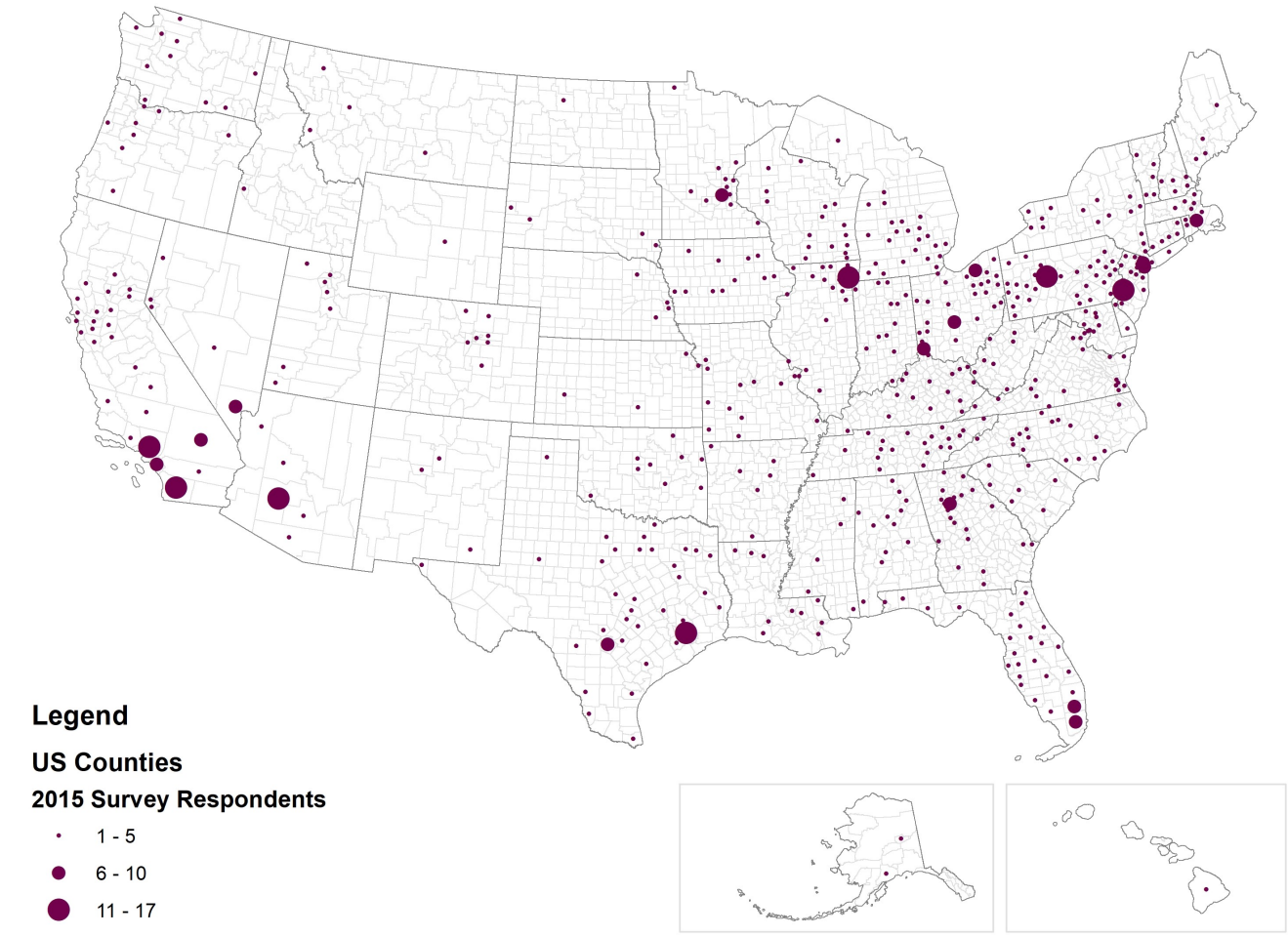

Figure 2.3: 2015 Cooperative Congressional Election Survey (CCES) Respondents

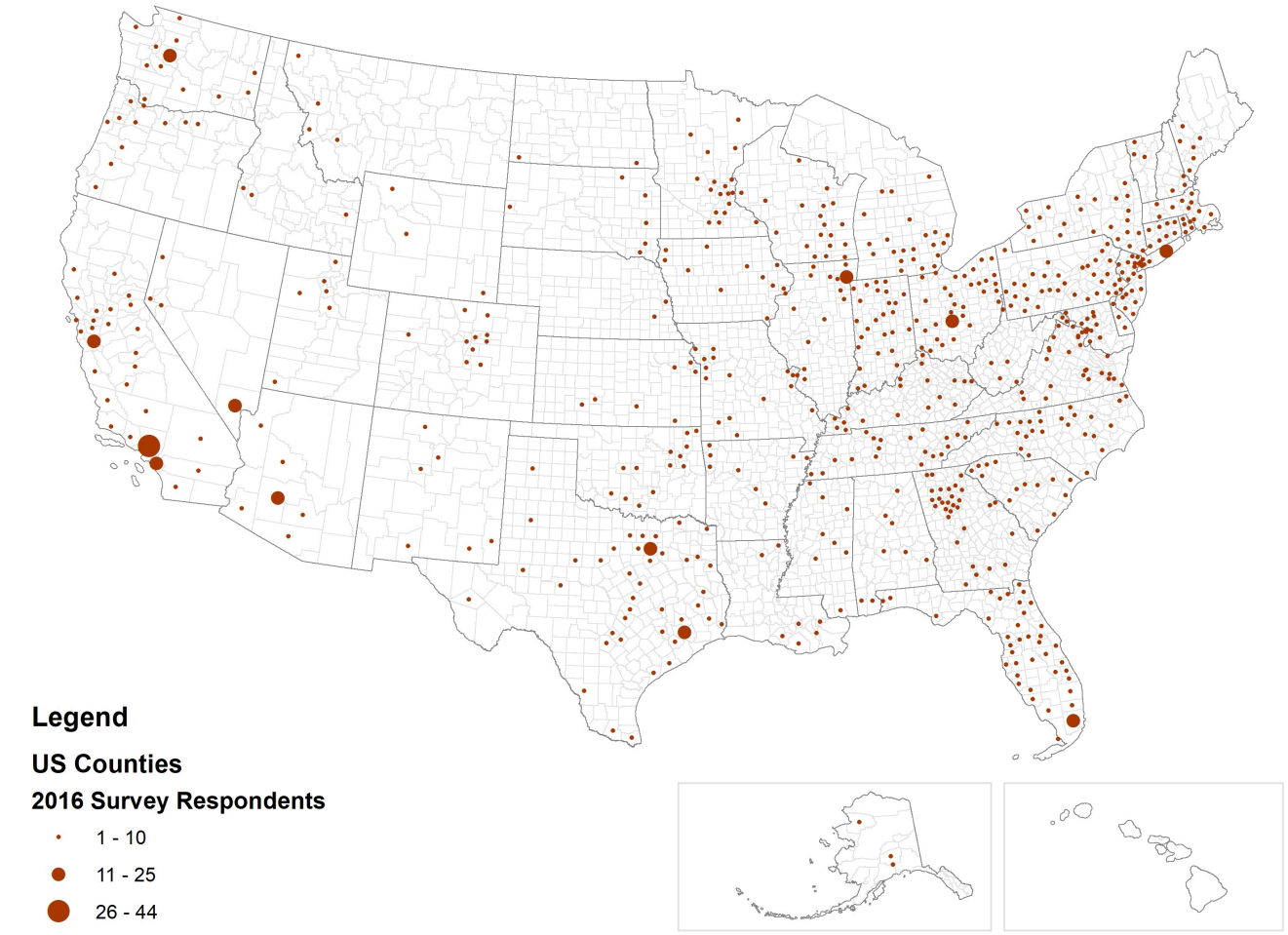

Figure 2.4: 2016 Cooperative Congressional Election Survey (CCES) Respondents

Table 2.3: Descriptive Overview of 2015 & 2016 CCES Survey Dependent Variable

2015 Survey

Education Taxes?	**Frequency**	**Percent**	**Cumulative**
Increase taxes for public schools	299	29.9	29.9
Decrease taxes for public schools	222	22.2	52.1
Keep taxes the same	475	47.5	99.6
Skipped	4	0.04	100
Total	1,000	-	100

2016 Survey

Education Taxes?	**Frequency**	**Percent**	**Cumulative**
Increase taxes for public schools	502	40.8	40.8
Decrease taxes for public schools	248	20.2	61.1
Keep taxes the same	476	38.8	99.8
Skipped	2	0.16	100
Total	1,228	-	100

including statistical significance and standard errors. All results are in odd ratio forms, which can be interpreted as coefficients greater than one are associated with higher odds of outcome (increasing taxes) and coefficients less than one are associated with lower odds of outcome (increasing taxes). If the coefficient equals one, this indicates that exposure does not impact the odds. All models are weighted.

As is common in surveys, the dependent variable (increase, decrease, or keep taxes the same) is a categorical variable. Using this dependent variable, I am able to estimate the explanatory model for the stated preferences of individuals in regards to the rate of taxes on schools. This question is intentionally vague, gauging an individual's perceptions of overall tax rates that benefit schools– it requires no specific knowledge in the complexity of school tax calculations. The main point of interest from this variable is the outcome of individual preference based on key explanatory and control variables. There is a natural ordering to the potential outcome, *decrease* to *leave the same* to *increase*, making the ordered logit model appropriate. With the ordered logit model, I model preferences among taxation options as a

function of social, economic, and demographic characteristics, as a linear function of values on one or more predictors. The ordered logit model is based on the following specification.

$$y_{ic} = \beta_1(X_{1i}) + \beta_2(X_{2i}) + \beta_3(X_{3i}) + \beta_4(X_{4c}) + \epsilon_{ic} \tag{2.1}$$

$$y_i = 0 \quad if\ y \leq \mu_0,$$

$$1 = \mu_0 < y \leq \mu_1,$$

$$2 = \mu_1 < y \leq \mu_2$$

where y_i is the observed preference for individual i. The tax preference function for each individual is composed of three individual components and one county level economic component plus the error component, $\epsilon_i c$. In the model, $\beta_1(X_{1i})$ is the income group of the individual, $\beta_2(X_{2i})$ is the impressions of federalism and redistribution of the individual, $\beta_3(X_{3i})$ is the demographic characteristics of the individual, and $\beta_4(X_{4c})$ is the economic characteristics of the county in which the individual resides.

Typically, models with different levels of aggregation suffer from heteroscedasticity and require some form of correction to separate error structures. If left without correction, estimates can be exaggerated at the highest aggregation level (Moulton et al., 1990). Common among the education literature is the use of hierarchical (or mixed, multi-level) models. These models have been found to be superior in correcting group level effects (Cheah, 2009). However, doubts around the application of this technique arise when the size of clusters are small (less than 5-10) and higher level variables are a function of lower level variables (average income or unemployment rate) (Schunck, 2016). These factors will cause estimated coefficients to suffer from downward bias. In the case of this paper, the average size of each cluster is 1.8 survey respondents. In addition, the county level variables (level 2) are drawn out of county respondents (level 1). Following this rationale, this paper relies on standard errors clustered at the county level. Primo et al. (2007) argue that, in estimating the effects of institutions on individuals, clustered standard errors are feasible options. Limitations clearly remain in

the application of this technique and the causal implications of models with multiple levels of aggregation. However, as argued by Busemeyer (2007), these models highlight insightful connections between macro-economic variables and micro-level outcomes.

In the individual year models, key independent variables are income groups (low, middle, and high). I am specifically interested in how the middle class behaves across place. The reference bracket for income variables is high-income, comparing the low- and middle- income to the high-income in each place. These variables are included to test the model hypothesis that income effects have varying geographical effects. This would mean that middle-class preferences are expected to diverge when comparing place. However, I am also interested in how elements of federalism and redistribution drives preferences. Respondents are also asked about their impressions of relative spending to other districts and comparative performance between districts. These variables further analyze the local effects of public goods outcomes relative to others (surrounding jurisdictions) as factors in setting a tax preference. Alternative independent variables are at the county-level, testing at a broader level the notion of rational under-investment, or the idea that education could generate negative externalities which drive down the demand for education. This latter, and secondary consideration, is operationalized through domestic migration rates (predicting individuals moving into a district from within the US) and international migration rates (predicting individuals moving into a district from outside the US). Migration into a region would capture local positive externalities primarily through local economic gain.

Control variables include education, ideological scale (moving from liberal to conservative), home-ownership status, being a parent, age, party affiliation, work status, and race variables. County-level variables (unemployment rate, local educational attainment, poverty rates, and immigration rates) are lagged in both models. In the third model, data is pooled to begin to analyze the urban-rural divide over time. To consider another form of place, the pooled model relies on population estimates. A county with less than 20,000 people is considered rural and a county with more than 20,000 people is considered urban. In reality, this is a conservative estimate that includes large towns in the urban group. However, it provides

another illustration of *rurality* in terms of population and how these place-based considerations shape public preferences for goods.

2.4.2 Model of Pooled Data (2015 and 2016)

In the first specification of the model, the data from the 2015 and 2016 data is pooled. The idea behind pooling this data is to attempt an estimation of the so-called urban-rural divide over time as a factor in education tax preferences. In this model, place is defined by population density. Rural counties are those with less than 20,000 people. This differs from the other models that define place-based categories on the USDA rural-urban continuum codes.

Compared to more densely populated counties (urban), being in a rural county reduces the preference for increasing taxes on public education. This variable is statistically significant at the 10 percent level. The ordered log-odds estimate on the interaction term is also positive and statistically significant, telling us that being in a less densely populated place compared to a more densely populated place increases the likelihood of preferences for increasing education taxes. Odds ratios can be interpreted as percent likelihood. In the case of the place-based dummy variable, for the rural county group the outcome of preferring an increase in taxes is approximately 55% less likely, compared to the urban county group and holding all variables constant. There is reason to believe that rural counties, based on population density in this model, increases preferences in a different way than those in urban, more-densely populated counties. The year variable measures preference change over time. This variable shows a positive effect on the likelihood for a preference of increasing taxes for education. This finding shows a substantial increase in the 2016 respondents preferring to increase education taxes compared to the 2015 data. In 2016, compared to 2015, there is a 44 percent likelihood of preferring to increases taxes for education. However, this increase is not driven by the urban sample but rather, the rural sample.

The interaction variable between year and place is an approximate estimate of this diverging preferences across this geographical divide. We can think of this variable as a measure of the urban-rural divide as a factor on tax preferences. In contrast to the place-based categor-

ical variable, the results of this interaction term differ. When interacted with time, there is a substantial swing in the preferences of the rural sample, compared to the urban sample. Over the two samples and compared to the urban county group, those in the rural county group are 3.23 times more likely to prefer to increase taxes for education. Contrary to the argument that ideology underlies a lack of government investment, rural residents in the surveys are more likely to prefer increasing taxes over time, compared to those in the urban sample. Figure 2.5 illustrates the predictive probabilities for the outcomes of the dependent variable (decrease, keep same, or increase taxes for public education) by place over time. Clearly, the change for increasing taxes for public education is greatest among the rural sample. Further, this finding provides some support that place-based preferences are shifting unique to the place. If preferences were based on one sample only, the rural respondents would appear to be more likely to oppose increasing taxes for education. However, when the samples are pooled, we find a more complex picture of preference formation. Indeed, place-based preferences are shifting in different ways. However, the ways in which preferences shift indicate that rural respondents, more so than urban respondents, are actually more likely prefer increasing taxes for public education.

In this model, I also control for local level economic variables. A key explanatory variable is the economic typology, or dominant economic industry, of each county. The baseline variable is a non-specialized economic sector, indicating that all other economic types are compared against a non-specialized economy. The non-specialized counties are those that do not meet the dependence criteria for any other economic type. Due to sample size limitations, I combine farming, mining, and manufacturing counties into one variable. These findings are not statistically significant. I also interact these variables with place (rural), resulting in no findings. However, in this pooled model, I find that as the rate of individuals in a county with (only) a high school degree increases, the outcome of preferring an increase in taxes is approximately 3% less likely, holding all variables constant. This finding indicates that the local educational attainment of each county is an indicator of preferences for education taxes. As the proportion of individuals with a limited education (high school) increases within a county,

the effect is to decrease the likelihood of increasing taxes that benefit public schools.

2.4.2.1 Ordered Logit Model of Pooled Survey Data

Prefer to Increase Taxes	coef.	s.e.
Rural	0.45^{+}	(0.20)
Year=2016	1.44^{***}	(0.15)
Year=2016 × Rural	3.23^{*}	(1.91)
Economy: Farming, Mining, Manufacturing	1.08	(0.17)
Economy: Government	0.92	(0.18)
Economy: Recreation	0.77	(0.15)
Economy: Farming, Mining, Manufacturing × Rural	0.90	(0.48)
Economy: Government × Rural	2.37	(2.66)
Economy: Recreation × Rural	1.24	(1.03)
Median Income 2015	1.00	(0.00)
Percent in Poverty 2015	1.03	(0.02)
Unemployment Rate 2015	0.98	(0.05)
Percent with High School Degree	0.97^{**}	(0.01)
Percent with College Degree	1.00	(0.01)
Rate of Domestic Migration 2015	1.01	(0.01)
Rate of International Migration 2015	0.99	(0.03)
N	2222	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.4.3 Model of 2015 Survey Data

In this second specification of the model, I am mainly interested in the effect of income across geography and the affect of fairness on education tax preferences. The first specification of the model includes all respondents across geography, including a dummy variable for non-metro based on the USDA rural-urban continuum codes. In addition, this variable is interacted with income to consider the relationship between income and geography. In the second specification of the model, only metro respondents are included. In the third specification, only

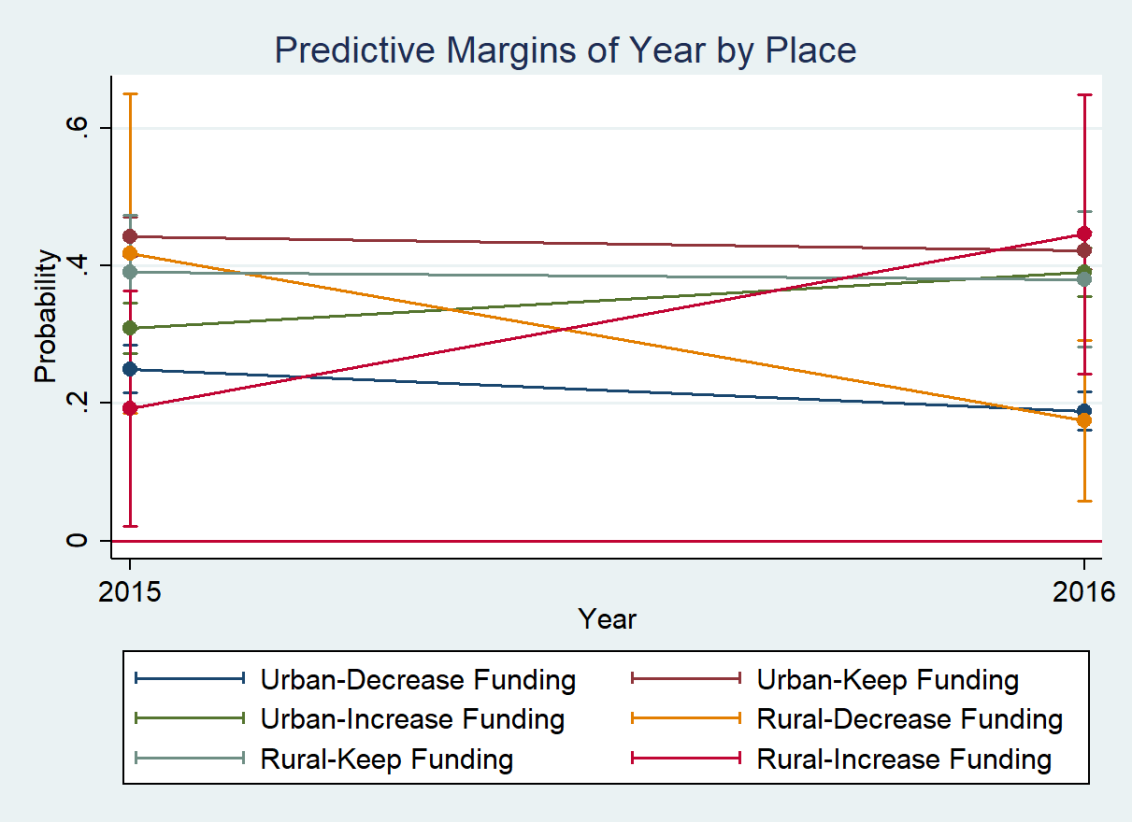

Figure 2.5: Predictive Margins of Year by Place (2015 & 2016 Surveys)

non-metro respondents are included. Following the pattern of demographic change across the United States, the total sample for non-metro respondents is smallest.

In the 2015 survey data, place, as a category to capture economic and social experience, is not statistically significant. This means that there is not real difference between non-metro and metro places in changing the likelihood of preferring to increase taxes for public education. Among the income variables (with the base category is high-income), there is no significant difference between income levels. The low- and middle-income groups are not significantly different than the high-income group.

However, when the income group is interacted with the non-metro variable, there is a significant difference among the middle-class. There are two ways to interpret this interaction effect. Being middle-class in a non-metro county, compared to being middle-class in a metro county, reduces the likelihood by approximately 80% of preferring to increase taxes for education. Alternatively, this findings also stands when we compare the middle-class to the high-income group in non-metro areas. This finding suggests that across metro and non-metro counties, the likelihood of preferring to increase taxes for education held by the middle-class changes. Furthermore, being middle-class in non-metro areas, compared to high-income, results in less demand for education. This group of individuals, the middle-income group, exhibit a decreased demand for education across place, even with controlling for education, ideology, parenthood, race, and party affiliation. This finding lends some support to the idea that individuals, regardless of local objective need, may exhibit contrary preferences. More importantly, preferences based on income levels vary across place.

The other key variables of interest are those that measure attitudes about fairness and comparisons across district. The intuition behind these measures is that local preferences are complicated through decentralization, where individuals compare public good spending and quality as a form of re-setting their own preference. The baseline for this category is spending less than average. The variable, spending average, is not statistically significant. However, spending more than average is significant and negative. Holding all variables constant, the view that your local school is spending above average, compared to below average, reduces the

likelihood by approximately 68% of preferring to increase taxes for education. Individual who believes that their local spending on public education is more than average prefers to reduce taxes on public education, relative to an individual who believes that spending is less than average. When interacted with place, these variables are not statistically significant, indicating no significant difference in this notions of fairness across place.

The next iteration of the fairness variables compares quality and performance of schools across jurisdictions. The baseline for this category is performing worse than average. As in the spending variable, the perception that schools are performing on average is not statistically significant. However, the notion that schools are performing better than average is significant. Holding all variables constant, the view that your local school is performing above average, compared to below average, increases the likelihood by approximately 95% of preferring to increase taxes for education. When interacted with the non-metro dummy variable, we find some variation across these belief categories.

Non-metro individuals who believe that schools are performing on average prefer to increase taxes for public, relative to metro individual. Holding all variables constant, the view that your non-metro, local school is performing on average, compared to metro, performing on average increases the likelihood by approximately 3.41 times of preferring to increase taxes for education. Average appears to mean two things based on where you live. The spatial relationship reflected in this variable is interesting because it indicates that while average school performance might drive down the preference to increase taxes in a metro place, it has the opposite effect in a non-metro place. It could be that average means two different things based on the local experience of an individual. This finding provides some support for the idea that individual preferences and demand are driven mainly through local experience and vary across place.

Finally, to further consider the notion that individuals in rural areas might be concerned with negative externalities, such as outward migration, the model is also estimated including population loss as a dummy variable. This is an imperfect measure as it is the county measure of population loss but is intended to test for spurious correlation. When this measure is inter-

acted with the non-metro dummy variable, the preference for education taxes is inverse. It is not a measure that is statistically significant but this indicates an inverse relationship between preferences for education taxes and the relationship between being in a non-metropolitan place with population loss versus being in a metropolitan place with population loss.

2.4.3.1 Ordered Logit Model of 2015 Survey Data

	Dependent Variable:					
	Increase Taxes for Education					
	Metro/Non-metro		Metro		Non-metro	
	coef.	s.e.	coef.	s.e.	coef.	s.e.
Non-metro	1.14	(1.02)				
Low-Income	1.04	(0.22)	1.07	(0.23)	0.52	(0.45)
Middle-Income	1.12	(0.24)	1.15	(0.25)	0.12*	(0.11)
Non-metro × Low-Income	0.41	(0.38)				
Non-metro × Middle-Income	0.20*	(0.16)				
Spend Average	0.78	(0.19)	0.78	(0.19)	0.37	(0.26)
Spend Above Average	0.32***	(0.09)	0.33***	(0.10)	0.58	(0.48)
Non-metro × Spend Average	0.46	(0.35)				
Non-metro × Spend Above Average	1.31	(1.17)				
Perform Average	0.85	(0.23)	0.83	(0.22)	2.41	(1.69)
Perform Above Average	1.95*	(0.51)	1.92*	(0.51)	2.70	(2.29)
Non-metro × Perform Average	3.41+	(2.49)				
Non-metro × Perform Above Average	2.22	(1.68)				
Education	1.24**	(0.08)	1.29***	(0.09)	0.90	(0.21)
Ideology Scale	0.79**	(0.06)	0.76***	(0.06)	1.19	(0.28)
Home Owner	1.01	(0.15)	1.02	(0.15)	0.79	(0.33)
Age (10 years)	0.96	(0.06)	0.99	(0.07)	0.79	(0.12)
Being a Parent	1.11	(0.23)	1.14	(0.25)	0.75	(0.44)
Not Working	0.71+	(0.13)	0.74+	(0.13)	1.22	(0.86)
Black	0.90	(0.43)	1.02	(0.51)	0.11	(0.24)
White	0.87	(0.24)	0.91	(0.27)	0.32	(0.32)
Hispanic	1.02	(0.41)	1.09	(0.46)	0.15	(0.19)
Median Income 2014	1.00**	(0.00)	1.00**	(0.00)	1.00	(0.00)
Percent in Poverty 2014	1.08	(0.10)	1.11	(0.11)	1.08	(0.26)
Percent in Poverty with Kids 2014	0.93	(0.06)	0.92	(0.06)	0.99	(0.16)
Unemployment Rate 2014	1.00	(0.08)	0.96	(0.09)	1.31	(0.31)
Percent with High School Degree 2014	0.95	(0.03)	0.94+	(0.03)	0.96	(0.10)
Percent with College Degree 2014	1.04*	(0.02)	1.04*	(0.02)	1.16*	(0.08)
Domestic Migration 2014	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
International Migration 2014	1.00+	(0.00)	1.00*	(0.00)	1.01**	(0.00)
Adj R2	0.07		0.05		0.32	
N	985		882		103	

Exponentiated coefficients; Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.4.3.2 Ordered Logit Model of 2015 Survey Data including Population Loss

	Dependent Variable:	
	Increase Taxes for Education	
Non-metro	1.17	(0.98)
Low-Income	1.04	(0.22)
Middle-Income	1.12	(0.24)
Non-metro × Low-Income	0.41	(0.38)
Non-metro × Middle-Income	0.20*	(0.16)
Spend Average	0.77	(0.19)
Spend Above Average	0.32***	(0.09)
Non-metro × Spend Average	0.46	(0.35)
Non-metro × Spend Above Average	1.30	(1.18)
Perform Below Average	1.00	(.)
Perform Average	0.85	(0.22)
Perform Above Average	1.95*	(0.51)
Non-metro × Perform Average	3.41+	(2.48)
Non-metro × Perform Above Average	2.23	(1.76)
Education	1.24**	(0.08)
Ideology Scale	0.79**	(0.06)
Home Owner	1.01	(0.15)
Age (10 years)	0.96	(0.06)
Being a Parent	1.11	(0.23)
Not Working	0.71+	(0.12)
Black	0.90	(0.43)
White	0.86	(0.24)
Hispanic	1.02	(0.41)
Median Income 2014	1.00*	(0.00)
Percent in Poverty 2014	1.08	(0.10)
Percent in Poverty with Kids 2014	0.93	(0.06)
Unemployment Rate 2014	1.00	(0.08)
Percent with High School Degree 2014	0.95	(0.03)
Percent with College Degree 2014	1.04*	(0.02)
Domestic Migration 2014	1.00	(0.00)
International Migration 2014	1.00+	(0.00)
Population Loss Dummy 2014	1.04	(0.30)
Non-metro × Population Loss Dummy 2014	0.93	(0.57)
Adj R2	0.07	
N	985	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.4.4 Model of 2016 Survey Data

In this sample of the 2016 survey data, three ordered regressions are again outlined. As in the 2015 survey data models, the first specification combines the metro and non-metro samples and then compares the metro and non-metro samples only. As in the first specification of this model, key variables of interest are income effects across geography and attitudes towards fairness and inter-jurisdictional fairness. These models use survey questions that ask respondents about their impressions of various education-related topics as either a problem or not. Respondents are asked whether they think local control, unequal resources, not enough funding, and the federal government are the main issues that challenge public education. These topics relate to components of decentralization and public provisions, each of which may drive the perception of respondents that the system is unfairly distributed. Each response can be interpreted as an individual who believes the variable is affirmatively a problem in public education. These variables are then interacted with the non-metro variable to consider how this perception drives the preference for education taxes.

Unlike the 2015 survey, none of the income variables are statistically significant in the 2016 survey regressions. However, when the samples are separated by place, we find that the low-income variable is significant and negative. This means that among the low-income in non-metro areas, relative to the high-income, there is an increased likelihood of preferring to decrease taxes for education. Holding all variables constant, being low-income in a non-metro place compared to high-income, reduces the likelihood by approximately 73% of preferring to increase taxes for education.

While it is insignificant, the middle-income group is also inverse in the non-metro sample. The lack of significance among the full samples could be due to sampling limitations, where only 172 individuals in the survey were living in non-metro areas, compared to 1054 in metro areas. This sampling technique could be limiting the geographical differences among respondents, which becomes more clear as we separate the samples into metro and non-metro groupings. Like the income variables, the place variable is not significant in this model when interacted with income. While these variables are not statistically significant, it is interesting

to note that when each sample is isolated into the metro and non-metro groupings, we do find that the directions of middle-income preferences vary.

Respondents are then asked about a variety of topics which they may or may not think are problematic for public education and local schools. Lack of local control, as a problem, is not statistically significant in the full model, nor is its interaction with place. In other words, the perception that lack of local control is a problem for public education is not significantly correlated with increasing the likelihood of preferring to increase or decrease taxes for schools. Among the non-metro samples, individuals in non-metro places who believe this is problematic are 57% less likely to increase taxes, relative to those who do not think that a lack of local control is a problem. On the contrary, the belief that unequal resources among schools is a problem increases the demand for education through increased tax preferences. Individuals who perceive unequal resources among schools as a problem prefer to increase taxes for education. Holding all variables constant, the view that unequal resources is problematic for public education, compared to those who do not think this is a problem, increases the likelihood by approximately 2.31 times of preferring to increase taxes for education. However, this relationship is not statistically significant when comparing metro to non-metro places. Among the metro sample, this finding is most pronounced. In the metro sample, the belief that unequal resources is problematic, compared to those who do not belief this, increases the likelihood of preferring to increase taxes for public education by 2.19 times.

Next, we turn to the belief that there is not enough funding as a problem for public schools. This variable is significant and positive, indicating that this belief results in individual preferences to increase taxes for education. Holding all variables constant, the view that not enough funding is problematic for public education, compared to those who do not think this is a problem, increases the likelihood by approximately 4.45 times of preferring to increase taxes for education. This does not vary across place, until we separate the samples and can see that this is mainly dominated by the strong effect among those living in non-metropolitan places. Among the non-metro sample, the view that not enough funding is problematic for public education, compared to those who do not think this is a problem, increases the likelihood by

approximately 5.05 times of preferring to increase taxes for education.

In contrast, the notion that the federal government is a problem drives down the preference for increasing taxes. Holding all variables constant, the view that the federal government is problematic for public education, compared to those who do not think this is a problem, decreases the likelihood by approximately 56% of preferring to increase taxes for education. We see this across all the geographic mini-samples, but it is most pronounced in the metropolitan sample. Among the metro sample, the view that the federal government is problematic for public education, compared to those who do not think this is a problem, decreases the likelihood by approximately 55% of preferring to increase taxes for education.

Among each of the belief variables, there is no significant interaction between problem perception and place in the full model. Being in a non-metro place and holding these perceptions of issues that plague the education system does not statistically differ from being in a metro place. Again, this could be due to the fact that this survey sample is heavily skewed towards the metropolitan respondents.

To check for spurious correlation, I also include a model that calculates population loss. As in the 2015 models, this is an imperfect measure that calculates a related externality to education. When population loss is included, we find that preference for education taxes is inverse. As a county experiences population loss, this reduces the likelihood by approximately 32% of preferring to increase taxes for education. While this is not statistically significant in the interaction term, the sign is inverse. This indicates there is a difference in individual preferences between geography when the local surrounding communities experience population loss. Interestingly, including this variable also shifted the results of the belief variables. When controlling for population loss, the belief that lack of local control is problematic drives down the demand for education taxes more for non-metro individuals than for metro individuals. Holding all variables constant, the view that lack of local control is problematic for public education in non-metro places, compared to those with the same belief in metro places, reduces the likelihood by approximately 57% of preferring to increase taxes for education.

2.4.4.1 Ordered Logit Model of 2016 Survey Data

	Dependent Variable:					
	Increase Taxes for Education					
	Metro/Non-metro		Metro		Non-metro	
	coef.	s.e.	coef.	s.e.	coef.	s.e.
Non-metro	1.77	(0.94)				
Low-Income	0.92	(0.20)	0.94	(0.21)	0.27*	(0.14)
Middle-Income	1.15	(0.22)	1.20	(0.23)	0.67	(0.29)
Low-Income × Non-metro	0.46	(0.26)				
Middle-Income × Non-metro	0.55	(0.27)				
Lack of Local Control	0.85	(0.15)	0.85	(0.15)	0.43*	(0.17)
Lack of Local Control × Non-metro	0.46	(0.22)				
Unequal resources among schools=2	2.13***	(0.40)	2.19***	(0.42)	1.63	(0.71)
Unequal resources among schools × Non-metro	1.06	(0.59)				
Not Enough Funding	4.45***	(0.71)	4.79***	(0.79)	5.05***	(1.93)
Not Enough Funding × Non-metro	1.15	(0.55)				
Federal Government	0.44***	(0.08)	0.45***	(0.08)	0.61	(0.27)
Federal Government × Non-metro	2.25	(1.13)			1.00	(.)
Education	1.15*	(0.07)	1.16*	(0.07)	1.24	(0.21)
Ideology Scale	0.79***	(0.05)	0.76***	(0.05)	0.93	(0.13)
Not Home Owner	1.63***	(0.23)	1.55**	(0.25)	1.62	(0.48)
Age (10 years)	1.09	(0.06)	1.08	(0.07)	1.10	(0.14)
Being a Parent	0.99	(0.15)	1.08	(0.17)	0.51	(0.21)
White	1.29	(0.33)	1.47	(0.36)	0.36	(0.32)
Black	1.13	(0.49)	1.06	(0.45)	1.78	(2.86)
Hispanic	1.10	(0.39)	1.12	(0.40)	0.77	(1.07)
Not Working	1.15	(0.17)	1.20	(0.19)	0.89	(0.33)
Median Income 2015	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Percent in Poverty 2015	1.03	(0.08)	0.95	(0.09)	1.05	(0.13)
Percent in Poverty with Kids 2015	0.99	(0.05)	1.00	(0.05)	1.01	(0.09)
Unemployment Rate 2015	0.93	(0.07)	0.90	(0.07)	1.07	(0.13)
Percent with High School Degree 2015	0.99	(0.03)	0.96	(0.03)	1.02	(0.06)
Percent with College Degree 2015	1.00	(0.02)	1.01	(0.02)	0.98	(0.04)
Rate Domestic Migration 2015	1.02*	(0.01)	1.01	(0.01)	1.05+	(0.03)
Rate International Migration 2015	1.00	(0.04)	1.01	(0.04)	1.13	(0.16)
Adj R2	0.14		0.14		0.26	
N	1226		1054		172	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.4.4.2 Ordered Logit Model of 2016 Survey Data with Population Loss

	Dependent Variable:	
	Increase Taxes for Education	
Non-metro	2.32	(1.42)
Low-Income	0.95	(0.21)
Middle-Income	1.18	(0.23)
Low-Income × Non-metro	0.41	(0.24)
Middle-Income × Non-metro	0.51	(0.25)
Lack of Local Control	0.85	(0.15)
Lack of Local Control× Non-metro	0.43^{+}	(0.21)
Unequal resources among schools	2.15^{***}	(0.40)
Unequal resources among schools× Non-metro	1.05	(0.59)
Not Enough Funding	4.43^{***}	(0.71)
Not Enough Funding × Non-metro	1.16	(0.56)
Federal Government	0.44^{***}	(0.08)
Federal Government × Non-metro	2.01	(1.01)
Education	1.15^{*}	(0.07)
Ideology Scale	0.79^{***}	(0.05)
Not Home Owner	1.61^{**}	(0.24)
Age (10 years)	1.09	(0.06)
Being a Parent	0.98	(0.15)
White	1.35	(0.34)
Black	1.15	(0.49)
Hispanic	1.22	(0.45)
Not Working	1.15	(0.17)
Median Income 2015	1.00	(0.00)
Percent in Poverty 2015	1.02	(0.08)
Percent in Poverty with Kids 2015	1.01	(0.05)
Unemployment Rate 2015	0.94	(0.07)
Percent with High School Degree 2015	1.00	(0.03)
Percent with College Degree 2015	1.00	(0.02)
Rate Domestic Migration 2015	1.01	(0.01)
Rate International Migration 2015	0.99	(0.04)
Population Loss Dummy 2015	0.65^{+}	(0.16)
Population Loss Dummy 2015=1 × Non-metro	0.90	(0.44)
Adj R2	0.15	
N	1226	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.5 Discussion of Variables

Among the control variables in the 2015 models, there are significant effects for individual education, ideology, party affiliation, and the unemployment rate. Being more educated increases the demand for education, in particular, among the metro sample. Ideology has the opposite effect. Increasing the conservative orientation of individuals reduces their preference for increasing taxes across all specifications of the model. It is also interesting to consider what is not statistically significant in these models. Being a parent, for example, is not significant. However, considering the direction of coefficients, there is movement across geography. While being a parent in a metro place increases demand for education (preference for increasing taxes), the opposite effect is found in the non-metro sample. In this specification, being a parent in a non-metro place reduces the likelihood of preferring to increase taxes for public education. We may assume that parents are nearly direct beneficiaries of public education, and these results could indicate that while being a parent of a child benefiting from education in a metro place results in positive externalities, it is the parents in the non-metro sample that experience negative externalities associated with better education, namely migration for work opportunities. Furthermore, while the percent of high school degree holders in a county increases, we find an inverse relationship to education. This means that individuals with only a high school degree in a place result in the preference to decrease taxes for education. In contrast, increasing the percent of college degree holders is positively associated with increases taxes for public education. Additionally, we find some variation in preferences based on international migration rates as we move over the geographical categories. Namely, international migration to a county has a significant effect on preferences for increasing taxes, but in this sample, the result is very minimal.

Among the control variables in the 2016 models, education is significant and increases the likelihood of preferring to raise taxes. Ideology is significant in all models except the non-metro sample, resulting in decreased taxation preferences as conservative ideological disposition grows. As in the first specification of the survey model, control variables such as age, being a parent, race, percent in poverty, and migration rates do not provide consistent results

across each sample specification. The key take-away from this model is that perceptions of problems appear to drive preferences for tax changes for public education. When we consider how these relationships compare across place, there is no significant difference. The type of places where respondents live (metro versus non-metro) does not capture different preferences. Rather, this is captured by beliefs about the main problems in public education.

There are clear limitations to this study. First, the data is cross-sectional. This provides only a snapshot of preferences and does not fully reveal causal mechanisms. From these results, we can infer association between variables and outcomes. Second, the samples for the non-metro or rural groups are not large. Again, this limits the statistical power of these results. Thus, all findings should be interpreted with caution. However, each model specification provides some insight into the place-based variation that might explain differences between those who live in metropolitan areas compared to those who live in non-metropolitan areas. Non-metropolitan residents compared to metropolitan residents seemingly set a different baseline for quality. Future research should consider the impact of comparing quality across goods and how those comparisons may have different starting points depending on place. In accordance, beliefs about systematic problems do not vary across place. This could be due to the way in which place is defined, which USDA rural-urban codes are not capturing. Thus, future analysis of the shared and divergent experiences across place could provide further insight into underlying mechanisms. Additional studies should focus on baseline variation in public goods and the underlying experiences that link or separate places, could offer better understanding into the rationality that drives preferences and ultimately, outcomes in public education and other public provisions.

2.6 Conclusion

Public education is complex and presents an individual with many functional forms that carry with them costs and benefits. When we ask a survey respondent to consider ”taxes for education,” there is an underlying calculation taking place. A person may be thinking of their own experience, the benefits experienced by their children, family, or friends, or the ways

in which better schools improve the level of local livelihood. They may be considering one or all of these outcomes from education. It is undoubtedly a complicated mental process. In fact, from the outside, these individual preferences may not seem so straight-forward. In particular, an incomplete picture of these preferences could continue to lend itself to the idea that individuals go against their own interest and ultimately, make contradictory decisions about public issues. This paper provides insight into one aspect of this process. In this paper, I show that while a geographic divide is present, it does not also provide clear categories for the beliefs or preferences of individuals. Simply put, place matters to a degree, but beliefs about problems, perceptions of performance, and inter-jurisdictional comparisons may better define the differences among individual calculations for setting tax preferences in relation to local public schools.

In the combined specification of the model, I pool the 2015 and 2016 survey data. This approach aims to analyze the urban and rural divide, over time. In this model, rural is defined as any county with less than 20,000 residents. In this analysis, being in a rural area, relative to an urban area- in this case densely populated- is associated with a preference to decrease taxes for education. However, this finding is not so straight-forward. Over the two samples and compared to the urban county group, those in the rural county group are 3.23 times more likely to prefer to increase taxes for education. Within these two samples, living in a rural area over the years of 2015 to 2016 increases the likelihood of an individual preference to increase taxes for public education, more so than indiviuals living in an urban area. So, what does this mean for the urban-rural divide? One, it is not a clear cut divide in terms of preferences for taxes or public education. In fact, rural residents in the surveys are more likely to prefer increasing taxes over time. Timing might have something to do with this finding. The year of the 2016 survey also marked the year of the United States presidential election. Dubbed by many as a rural revolt, the election was considered a function of mainly ideological political preferences driven by populist policies. However, Monnat and Brown (2017) argue that while place matters in politics, the national election was mainly a function of the distribution of economic, social, and health challenges disproportionately affecting more rural areas. My findings indicate that

national political preferences may differ from local preferences for public goods. Indeed, the rural sample compared to the urban sample, exhibits increased likelihood to prefer increasing taxes for public education. When the samples are pooled, we find a more complex picture of preference formation. Indeed, place-based preferences are shifting in different ways.

Findings from the separate specifications of the models highlight the variables that factor into preferences for education taxes. In the specification of the 2015 survey model, the key finding is that there is a difference in the way that the middle-income group in non-metro areas prefers education taxes compared to their counterparts in metro areas. Living in a non-metro place increases the likelihood to prefer decreasing taxes for public education, relative to metro middle-income individuals. The second key finding is that beliefs matter for preferences for education taxes. The belief that local schools are spending more than average reduces demand for education, resulting in an increased likelihood to decrease taxes. In contrast, the belief that local schools are performing better than average increases the demand for education, with an increased likelihood to prefer more taxes for public education. Comparing these beliefs between the place-based categories, there is no statistical difference between beliefs about spending more than average as a factor in regard to changing education taxes. However, the belief by non-metro individuals that their schools are performing on average increases their preference for more education taxes, relative to their metro counterparts. Holding all variables constant, the view that your non-metro, local school is performing on average, compared to metro, local schools performing on average, increases the likelihood by approximately 3.41 times of preferring to increase taxes for education. Average appears to mean two things based on where you live. This findings spurs questions about how the relative outcomes of schools may differ between metro and non-metro individuals.

In the specification of the 2016 model, place based differences are less significant in predicting education tax preferences. In fact, there is no statistical significance between these variables that interacted with income groups or beliefs about the challenges facing public education. However, the key finding of this model is telling in a unique way. Mainly, individuals across the United States prefer to increase taxes for local public education when they believe

that unequal resources and not enough funding are problematic for public education. Holding all variables constant, the view that unequal resources is problematic for public education, compared to those who do not think this is a problem, increases the likelihood by approximately 2.31 times of preferring to increase taxes for education. Holding all variables constant, the view that not enough funding is problematic for public education, compared to those who do not think this is a problem, increases the likelihood by approximately 4.45 times of preferring to increase taxes for education. On the contrary, the belief that the federal government is a problem in public education is associated with a preference to decrease taxes. Holding all variables constant, the view that the federal government is problematic for public education, compared to those who do not think this is a problem, decreases the likelihood by approximately 56% of preferring to increase taxes for education. Interestingly, there is no statistical difference in these beliefs across the place-based categories.

While beliefs about the problems in public education may build off ideological positions, differences in these beliefs between metro and non-metro individuals are insignificant. These findings indicates that while metro and non-metro individuals may drive their preferences for local taxes based on unique comparisons across schools, current descriptions of place (urban and rural) are not fully capturing this variation. In one case, average schools may be good and increase the preference for education tax increases. In another, average schools are bad and may reduce the preference for increasing taxes. However, beliefs (that are often associated with ideological leanings) are not shaped by place in different ways. In this regard, individuals, regardless of place, are more alike than different.

Income, for example, is considered one of the main determinants of tax preferences. I argue that income levels across place would result in differential preferences. However, the models estimated in this chapter show limited support for this conjecture. In the 2015 survey, I find that being middle-class in a non-metro county, compared to being middle-class in a metro county, reduces the likelihood by approximately 80% of preferring to increase taxes for education. In the 2016 survey, I find that being low-income in a non-metro county, compared to being high-income in a non-metro county, reduces the likelihood by approximately 73% of

preferring to increase taxes for education. These findings provide limited support for the effect of income on the likelihood of individuals in non-metro places to prefer decreasing taxes, compared to those in metro places.

It seems that ideological differences are the main way that we explain differences across place, in particular, when we compare the urban and rural divide. My findings suggest that differences indeed exist between residents of each place. However, these differences are mainly associated with individual perceptions of public education, including cross-jurisdictional comparisons and beliefs about problems in public education. While performing on average may be positively associated with increasing taxes for non-metro individuals, it would be negative for metro individuals. This indicates a more subtle difference between the political and economic preferences of residents in each place. Less so about ideology, these individuals may measure their local public goods using different baselines. These baselines are built on comparisons across places and beliefs about problems. The argument that ideology is the main contributor to their preferences for public provisions appears inflated. While beliefs are clearly drivers in setting tax preferences, there is overall little statistical difference in the effect of these variables on taxes for public education, when we compare metro and non-metro individuals. Meaning that whether an individual believes the problem is unequal resources or the federal government, place does not always define these ideological and political divides.

CHAPTER 3

LOCAL RETURNS TO PUBLIC EDUCATION: CONNECTING UNEMPLOYMENT, INCOME, AND MIGRATION TO INDIVIDUAL DEMAND FOR EDUCATION SPENDING

3.1 Overview

Spatial characteristics are relevant for understanding the ways in which individuals place value on the public goods that surround them. It makes sense that where an individual lives and experiences collective outcomes, like schools or roads, shapes their standards for what they may consider adequate and sufficient. As time passes, individuals observe the public goods around them. They observe increases and decreases in public investment at the local level. This allows individuals to continue updating their preferences for each good based on the local experience. These local experiences could be categorized in a number of ways. Place (urban, suburban, and rural) is one of these categorizations and it could not only be an outcome for general preferences, but it also could drive individual preferences themselves. Where you experience goods sets your standard for what you might consider to be good enough or it could inspire a preference for change in government expenditure.

This article presents an analysis of place-based preferences. Specifically, preferences on K-12 public education by the state for local schools. This preference for school finance is a reflection of local demand for education. The effect of locality should be captured by the place-based categories of urban, suburban, and rural. Each category encompasses the local economy of education, including variation in current spending on schools. While expenditure per pupil is comparable among rural and urban areas, the highest expenditures are found in suburban

areas (Cornman et al., 2018). However, expenditure does not account for cost variation among schools. From 2014-2015, rural schools experienced the lowest percentage change in median inflation-adjusted total revenue per pupil (1.8 percentage change, compared to 2.5 in urban and 3.9 in suburban– average percent change across the US was 2.2) as well as the lowest percent change in median inflation-adjusted expenditures per pupil (1.4 percentage change, compared to 1.8 in urban and 3.8 in suburban– average percent change across the US was 1.7) (Cornman et al., 2018). Overtime, rural schools (compared to urban and suburban) remain below national and inter-geographic trends of per-pupil spending and expenditure. However, rural schools face similar disadvantages to urban schools such as concentrated poverty and challenges in student achievement (Burdick-Will and Logan, 2017). Furthermore, rural schools tend to serve large proportions of disadvantaged students, with high rates of low-income students (Logan and Burdick-Will, 2017). Increasingly, rural schools struggling with insufficient budgets have moved towards consolidation and reorganization, often creating other costs such as increased transportation expenses (Tieken, 2014). These unique challenges may shift public preferences in unique ways- providing insight into the determinants of education demand, and ultimately, outcomes in rural areas.

It could be that a feedback loop may emerge in some places, where financial constraints impact educational achievement and opportunity, leading to public preferences that further constrain adequate funding for rural schools. If this is the case– where an individual resides is not only an outcome but also a determinate– it could be argued that considering how much a person prefers to spend on a public good is, essentially, a local calculation. To get at this idea, I use the case of state spending on public (K-12) education to test how place may drive preferences. Public education is a relevant topic for this study because it varies across place (depending on where you live, the funding of education varies) and the complementarity nature of education (related to local employment) allows for some isolation of local economic effects. This variation in public education across the United States provides some context for understanding variation in preferences. The logic behind this argument is that individuals will value local education more, when the local employment opportunity (the return on investment)

is higher. In other words, individuals value (and prefer to spend more) on public education when they estimate a positive local economic effect.

This paper seeks to build an empirical understanding of the complementarity economic considerations for public education (primary and secondary) across place. First, I analyze social movement across place and discuss the role that movement could have on preference formation. The discussion of movement is intended to outline the role of place in preference formation. Second, I analyze nationally representative survey data to empirically test the notion that where an individual lives factors into how that individual values public goods, focusing specifically on the local unemployment rate and median household income. Most importantly, I employ a comparative approach to place (rural, suburban, and urban) to provide insights into how shifting economic factors impact the so-called spatial divide between preferences.

The goal of this study is to illuminate the way in which preferences are shaped by place and how that may feed back into the distribution of funding for public goods. Underlying this research approach is the notion that where one lives shapes the way that they value public goods. This paper represents a small step in understanding place-based preference variation in the United States. In addition, this article informs a long-held question of political scholarship that some individuals hold preferences for government that go against their own interests. Combining survey data and county-level economic and demographic data, I extend the research on the dynamics between place and preferences for public goods.

3.2 Literature

Public education, primary and secondary, is generally provided as part of a set of public goods provided by most industrial nations, within a basic welfare state framework (Busemeyer, 2007). Basic education services are provided by the state in a generally consistent manner. However, variation remains across and within countries. Like most variation among public policies, there is a potential feedback loop with public support. Income, education, and race play roles in determining individual support for welfare state policies (Hasenfeld and Rafferty, 1989; Alesina and La Ferrara, 2005). Furthermore, a gap is found to exist along class lines,

particularly between low and high-income Americans (Gilens, 2009). In addition, preferences for spending in the welfare state are mainly determined by personal characteristics such as age, gender, race and socio-economic level, in addition to political ideology and perception of fairness (Alesina and Giuliano, 2011).

Economic theory has long assumed that people are primarily motivated through (material) self-interest, driven by a combination of price and income (Denzau and Grier, 1984). Partisan ideology, or self-interest, have also been found as a determinant for preferences of income transfers in the welfare state (Iversen and Soskice, 2001; Alesina and La Ferrara, 2005; Lynch and Myrskylä, 2009). Income is one of the prevailing determinants for taxation and spending preferences. Meltzer and Richard (1981) assert that as income increases, individuals oppose more redistribution; yet as median income drops below mean income, the median voter will support greater redistribution. This is within the context of current income, but future income also serves as a strong determinant in preferences for redistribution. Benabou and Ok (2001) find that the probability of upward mobility is a likely component in the consideration of redistributive policy by individuals. Accordingly, opposition to redistributive policies is a function of incomes below the mean, but more importantly, the expectation of a below mean income in the future. Moene and Wallerstein (2001) argue that inequality serves as a factor for support of welfare spending; as inequality increases, benefits for the employed maintain support while benefits for those without earnings decline.

Spatial context provides some insight into variation in economic and political preferences. A growing body of research has demonstrated the relationship between preferences and political behavior (Citrin and Green, 1990; Frank, 2004; Ansolabehere et al., 2006; Bartels, 2016). Understanding individual preferences and the distribution of public benefits, is furthered by considering heterogeneity in preferences across geographical and spatial divisions. In contrast to urban and suburban areas, rural areas in the United States are experiencing population decline, whereas urban areas are experiencing consistent gains to population (Cromartie, 2016). Rural communities also experience higher rates of poverty than those found in urban and suburban areas (United States Department of Agriculture, 2017).

Place, defined by urban, suburban, and rural categories, is one way to encompass the common factors that might drive these places to prefer public goods differently. The rural sentiment of being overlooked or forgotten could be translated into less support for public provisions. This could be an ideological statement (Cramer, 2016). Certainly, the policy lens has long-centered on urban places and the many challenges within them. Rural places may be overlooked, or worse, intentionally discarded as a reflection of perceived economic inefficiency leading to continual decline and economic hardship (Rodríguez-Pose, 2018). Economic growth and development would then continue to disproportionately benefit growing, urban areas and potentially, their suburban neighbors.

This territorial imbalance may hinder individuals in putting more faith into government intervention, but rather sow further discord between the public and public institutions. This would result in place-based preferences influenced by history to seek increased economic opportunity. More importantly, the contrast between urban and rural policy backgrounds highlights the relationship between local conditions and individual attitudes. In effect, place of residence serves as a form of local tempering for preferences. This local experience would closely reflect the *conversion by conversation* theory, which asserts that minority viewpoints are likely to be converted by close proximity of majority viewpoints– which arguably, would differ in urban, suburban, and rural places (Walks, 2004). In the context of public education, place would capture the variation in spending preferences based on unique, local economic conditions. General economic understanding builds a case that households sort themselves based on wealth, preferences, local public goods, and social characteristics (Kuminoff et al., 2013). In this paper, I argue that place of residence itself further serves to mold preferences based on local conditions.

3.3 Complementarity Considerations

3.3.1 Movement

When it comes to paying for schools, multiple factors matter. One of these factors is the ability to become employed and generate future earnings. The intuition behind this comple-

mentary relationship is that public education is more valuable when employment and wages improve. Following the rationale of Albouy et al. (2018), this argument implies that demand for education relies on complementary considerations, such as opportunity for social mobility. While there is certainly intrinsic value in public education, the individual level calculation for spending would be intertwined with the employment outcomes in close proximity. This approach differs from traditional models of sorting, which generally claim that individuals move towards their preferences. Rather, variation in demand for public education may be a function of the local outcomes. Without considering the variation of a local good, preferences (such as willingness to pay or increased demand) will not be related to observable differences in public good endowments (Albouy et al., 2018). Preferences will be driven by a local calculation, related to current endowments, rather than a function of individual income, race, or ideology.

There are two primary competing models to describe why we continue to see urban-rural disparities. The first is that people have preferences that drive them to live in a place where those preferences are met. This is the classic model of voting with your feet (Tiebout, 1956). With market forces at work, individuals are free to move to where their preferences are optimally met. After individuals sort into these groups, they will shape the characteristics of that place further. In this model, an individual has perfect mobility and moves to a place where the local government best meets their needs. Tullock (1971) later expanded this model to emphasize that individuals select a place based on both government goods or services, as well as the tax burden on that individual in a specific place. Based on this idea, preferences drive movement and we would find that a form of self-selection drives preference concentration. This option reflects the exit option in the exchange between citizens and policy-makers (Hirschman, 1970). Place categorizations further complicate the Tiebout model. Gramlich and Rubinfeld (1982) argue that while the model may apply to urban and suburban communities, it does less so to rural areas with limited public sector choice. Indeed, the authors argue the fiscal incentive to migrate towards more efficient public provisions may be overstated (Gramlich and Rubinfeld, 1982).

An alternative explanation is that individuals are restricted in places due to friction in

location choice, and essentially, individuals become *stuck to stay*. According to this approach, individuals are financially limited– in particular, low-income individuals, in their choice to move for better economic opportunity. This means that regardless of their preference, they are unable to move to another place. This could be due to a lack of economic means or the opportunity cost placed on looking and relocating. People are unable to move due to social and economic reasons which result in a set of preferences that are formed by that place. This second option reflects the voice option Hirschman (1970). Being unable to move, individuals may be more likely to build preference sets based on local effects, voicing opinions that reflect these conditions.

Both of these models build support for the relationship between place and preference. Whether I choose to move into a community that more optimally meets my needs or I am unable to leave due to limitations, place would factor into our decision-making around local spending on goods. Based on the Tiebout (1956) model, I would expect to find that within a sample of individuals, movement would be common across all places. However, based on economic frictions, low-income individuals would be less likely to have moved than high-income individuals. In addition, it would be likely that the experience of mobility differs across age.

Using the 2016 CCES (Cooperative Congressional Election Survey), I begin by analyzing movement through the lens of the urban-rural divide. First, I find that movement between place (urban, suburban, and rural) categories is generally uniform. Table 3.1 displays the weighted rate of movement (years of residence in current city) across place. Across each place, approximately 27 percent or more have lived in their residence for more than 25 years. This cohort has lived the longest in their current place of residence. The same finding is true for the other categories of living in a place of residence. Among those that have resided in their city for 10 to 24 years, we again find comparable distribution across place, with an average of 31-32 percent in this category. Further, across place, between 23 and 25 percent of individuals have lived in their current place residence for less than 4 years. This cohort would reflect those moving between places of residence. In all places, we see comparable movement and tenure

between groups. There is no striking findings that suggest movement is driving people to or from places. In contrast, if this sorting behavior is occurring, it appears uniform across place.

Ability to move would arguably affect income groups differently; those with more resources would be more likely to move based on preferences. Table 3.2 displays the weighted rate of movement (years of residence in a current city) across place by low-income segments of the survey sample. Among the low-income group, we find that the lowest percentage of individuals who have moved most recently (less than 4 years) is in the rural sample. However, this group does not necessarily trail far behind their urban and suburban counterparts. Across all other years of residence, we find comparable rates. Low-income individuals, living in urban, suburban, or rural areas, appear to be moving in similar patterns. Table 3.3 shows the rate of movement among middle-income individuals. In the middle income group, each place-based middle class has comparable rates of movement and residence. In fact, the middle-income group appears to not be moving or staying anymore often than the low-income group. Compared to the low-income and middle-income groups, we find a slightly different movement by the high-income sample. Displayed in table 3.4, high-income individuals exhibit a slight uptick among the percent of individuals residing in a place of residence for 10 to 24 years. Again, this increase is uniform across all places.

Thus far, movement and length of residence appear to remain uniform across the sampled population. However, it could be that these cross-tabulations do not capture the group most-likely to move: young people. Table 3.5 displays the weighted rate of movement among individuals between the ages of 18 and 36, the age group that would most likely reflect movement for educational opportunities. This group certainly highlights the most recent case of movement (with an increase in the percentage that have moved within the last 4 years). The descriptive tables show that movement is generally uniform across place. The most likely young people to move are those from suburban areas, but this is followed closely by the rates in other places. Indeed, young people moving (from cities, suburbs, or the country) are doing so in uniform fashion.

Individual preferences would impact educational budgeting through two mechanisms,

Table 3.1: Duration of Residence Across Place by Full Sample of Individuals

Place	Less than 4	5 to 9 yrs	10 to 24 yrs	25+ years
Urban	14,780	8,632	18,144	15,395
	26%	**15%**	**32%**	**27%**
Suburban	1,167	701	1,402	1,286
	26%	**16%**	**31%**	**28%**
Rural	714	489	957	848
	24%	**16%**	**32%**	**28%**
Total	16,661	9,822	20,503	17,530
	26%	**15%**	**32%**	**27%**

Table 3.2: Duration of Residence Across Place by Low-Income Individuals

Place	Less than 4	5 to 9 yrs	10 to 24 yrs	25+ years
Urban	7,061	3,782	7,414	7,275
	28%	**15%**	**29%**	**28%**
Suburban	676	371	701	681
	28%	**15%**	**29%**	**28%**
Rural	388	265	502	444
	24%	**17%**	**31%**	**28%**
Total	8,136	4,431	8,637.	8,414
	27%	**15%**	**29%**	**28%**

Table 3.3: Duration of Residence Across Place by Middle-Income Individuals

Place	Less than 4	5 to 9 yrs	10 to 24 yrs	25+ years
Urban	4,631	2,75	5,541	4,690
	26%	**16%**	**31%**	**27%**
Suburban	313	207	427	383
	24%	**16%**	**32%**	**29%**
Rural	208	138	258	242
	25%	**16%**	**31%**	**29%**
Total	5,148	3,096	6,225	5,318
	26%	**16%**	**31%**	**27%**

Table 3.4: Duration of Residence Across Place by High-Income Individuals

Place	Less than 4	5 to 9 yrs	10 to 24 yrs	25+ years
Urban	2,011	1,336	3,535	2,213
	22%	**15%**	**39%**	**28%**
Suburban	62	47	89	65
	23%	**18%**	**34%**	**25%**
Rural	24	22	45	45
	18%	**16%**	**33%**	**32%**
Total	2,084	1,397	3,646	2,310
	22%	**15%**	**39%**	**24%**

Table 3.5: Duration of Residence Across Place by Young Individuals (age 18-36)

Place	Less than 4	5 to 9 yrs	10 to 24 yrs	25+ years
Urban	7,370	3,042	4,554	2,992
	41%	**17%**	**25%**	**16%**
Suburban	542	202	252	204
	45%	**17%**	**21%**	**17%**
Rural	295	136	159	112
	42%	**19%**	**23%**	**16%**
Total	8,201	3,378	4,954	3,304
	41%	**17%**	**25%**	**16%**

voice or exit (Hirschman, 1970). According to Hirschman (1970), within the context of budgeting, individuals will leave a community (exit) where public expenditures do not meet their preferences or use political influence (voice) to change budget levels to meet their preferences. In this paper, I seek to build a model of preference variation (over geography) rather than a model of how a school budget came to be (through movement of individuals or political activism around budget levels). Following the rationale of Brown and Saks (1983), both mechanisms likely work simultaneously.[1]

Across the spatial divide we find that movement is comparable. These findings do not contradict the theories of movement, but rather inform of our understanding of movement, or how little there actually is across income groups, young people, and place. Movement is not as common as may be suggested by theory, at least among the general population. In nearly all cross-tabulations, beside the youth, the majority of respondents are staying in their place of residence for over 10-25 years. A limitation of this data is that we do not know the direction of movement (for example, rural to rural or urban to urban). Should place factor into their preference for public education, it is likely that those decisions are made on the local-level with a local consideration of economic opportunity. In this analysis, this local calculation of complementary outcomes relative to public education spending are captured by county level unemployment rates and median household income– both of which reflect local, economic prosperity.

Underlying local preferences are three considerations outlined by Brown and Saks (1983). The first is that the kinds of public goods or bundles of policies are not available in all places. This means that the opportunity for movement across place does not always result in the same policy outcomes, access to certain goods could be lost along the way. The second is that elements of public provisions and goods change continually within the local economy. Neighbor-

[1]A concern of this analysis was reverse causality. Decreases in spending on education could reduce local employment and wages. In contrast, decreases in local employment and wages could reduce spending on education (for example, fiscal constraints that limit revenue generation). To mitigate possible endogeneity, including reverse causality, I constructed a shift-share (Bartik instrument) based on trends in county-level employment wages overtime. The idea was to improve the causal relationship between economic conditions in a county and demand for education. However, due to the limitations of using a cross-sectional dataset as well as the theoretical notion that preferences are forward-looking, the instrumental variable results are not included. Instead, I key independent variables are lagged from 2015.

hoods, job markets, and availability are in constant flux. Finally, there are costs to movement. Individuals may pay with opportunity costs, relocation expenses, or personal costs, such as loss of familiar ties. The point of this analysis is the inter-place differentiation leading to variation in preference for education spending, specifically focusing on the distinctions of urban, suburban, or rural.

3.4 Empirical Results

3.4.1 Ordered Logit Model

The empirical strategy of this paper is employed to analyze individual and county-level dynamics as factors in preferences for state spending on education. The dependent variable asks respondents to select their preferred course of action by the state government for public education funding, moving from a great decrease to great increase. In this paper, I use an ordered logit model which relies on the natural ordering to the dependent variable, *greatly decrease* to *decrease* to *leave the same* to *increase* to *greatly increase*.With this model, I estimate state spending preferences as a linear function of individual and county level variables. The ordered logit model is based on the following specification.

$$y_{ic} = \beta_1(X_{1i}) + \beta_2(X_{2c}) + \beta_3(X_{3c}) + \epsilon_{ic} \tag{3.1}$$

$$y_i = 0 \quad if\ y \leq \mu_0,$$

$$1 = \mu_0 < y \leq \mu_1,$$

$$2 = \mu_1 < y \leq \mu_2,$$

$$3 = \mu_2 < y \leq \mu_3,$$

$$4 = \mu_3 < y \leq \mu_4$$

where y_i is the observed preference for individual i within county c. The state spending preference function for each individual is composed of a one main individual component and two

county level economic component plus the error component, $\epsilon_i c$. In the model, $\beta_1(X_{1i})$ is the length of duration of the individual, $\beta_2(X_{2c})$ is the county median income, $\beta_3(X_{3c})$ is the county unemployment rate. Additionally, each model includes a vector of individual traits and county-level economic factors in which the individual resides.

Another level of complexity in this model is the nesting of respondents into their respective counties. The multiple levels of aggregation can cause heteroscedasticity within estimates. While the total number of observations vary across counties, less than one percent of the sample has only one observation in a county and less than 15 percent of the sample has ten observations in each county. Survey data is collected through a nationally stratified sample of the United States. However, I am not only interested in the sampled population, but rather the broader population. Since there are counties in the population that are not included in this sample, it is advised to cluster standard errors at the county level (Cameron and Miller, 2015). Although there are multiple methods to cluster standard errors, the models in this paper are specified to include county-level fixed effects, meaning a separate intercept is estimated for each level of the aggregate clusters (counties). I chose to include cluster-specific fixed effects because I want to control for correlated error between the regressors and error term. Including county-level fixed effects, basically a dummy variable for each county, reduces inconsistent estimation of coefficients by including mean-differencing at the cluster level (Cameron and Miller, 2015). Estimated models include a separate intercept for each county, but these are not listed in the output tables.

3.4.2 Data

For the empirical analysis, I use survey data (cross-sectional) collected through the 2016 Cooperative Congressional Election Study (CCES). Figure 3.1 shows the 2016 CCES common content survey respondents by county, mapped across the United States. In this survey, individuals from across the country are randomly selected and polled regarding their attitudes towards political, social, and economic issues. The key variable measures individual attitudes towards spending on education. Respondents were asked the following: “State legislatures must make

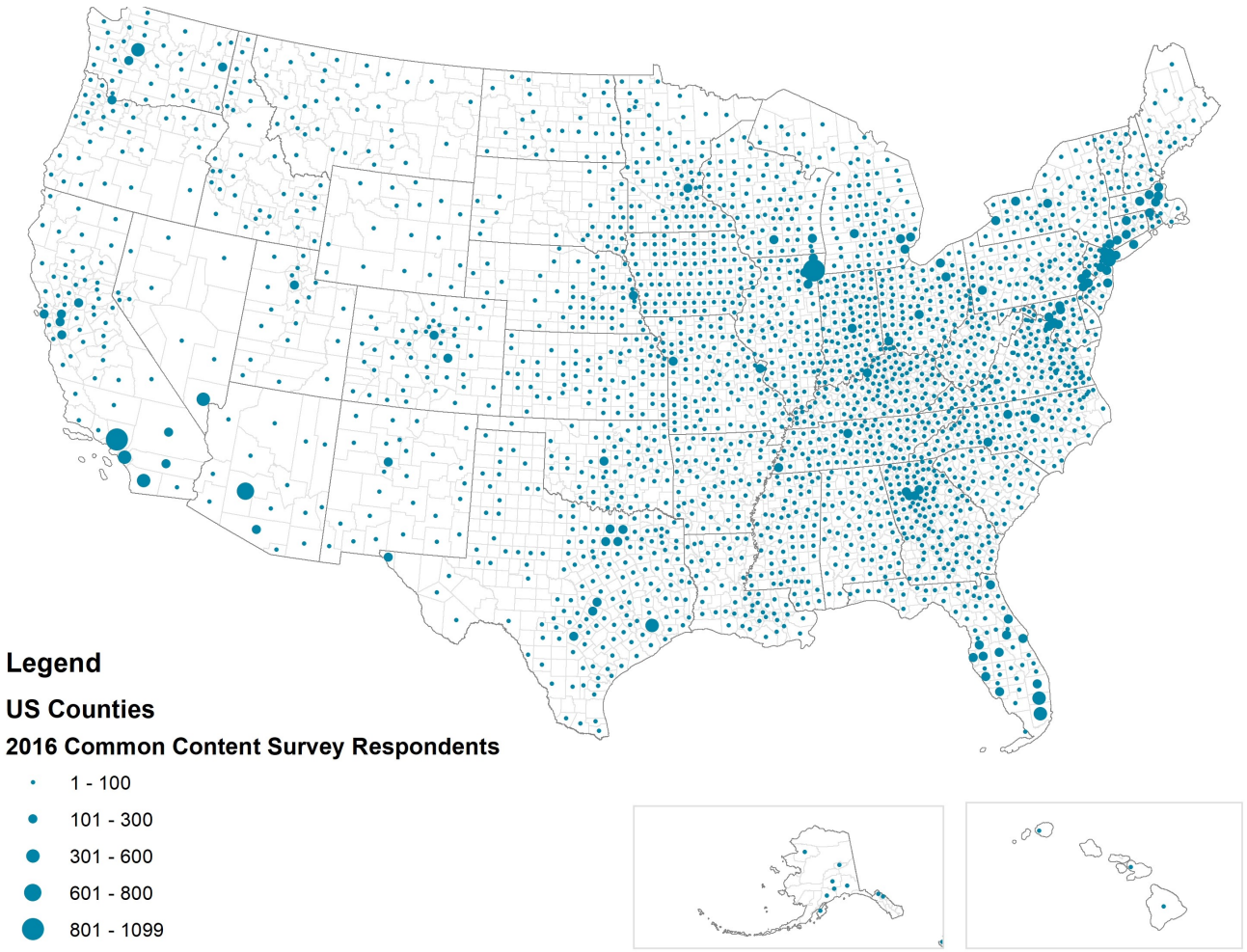

Figure 3.1: 2016 Cooperative Congressional Election Survey (CCES) Common Content Respondents

choices when making spending decisions on important state programs. How would you like your legislature to spend money on education?" Responses ranged from greatly decrease (1) to greatly increase (5). The average value of the total sample is 3.8, indicating that respondents prefer only slightly more than the status quo. Table 3.6 outlines the descriptive statistics of this variable by place. I include a second dependent variable as a point of contrast. In this question, respondents were asked how they would grade (A=excellent to F=Fail) local schools in their community. Table 3.7 outlines the descriptive statistics of this variable by place. The percents listed below are among each place group (urban, suburban, and rural).

Using zip codes from survey respondents, I match each individual to the economic char-

Table 3.6: Dependent Variable (total and percent): How would you like your state legislature to spend money on education?

Place	Great Decrease	Decrease	Keep Same	Increase	Great Increase
Urban	1,687	2,725	12,911	13,353	15,727
	3.64	5.87	27.82	28.78	33.89
Suburban	142	255	1124	1140	1122
	3.76	6.75	29.7	30.13	29.66
Rural	77	159	785	776	683
	3.1	6.4	31.66	31.29	27.55
Total	1,906	3,139	14,819	15,268	17,532
	3.62	5.96	28.14	28.99	33.29

Table 3.7: Alternative Dependent Variable (total and percent): How would you grade your local schools?

Place	A: Excellent	B: Above Average	C: Average	D: Below Average	F: Poor
Urban	6,533	14,818	18,090	5,284	1,922
	14.01	31.77	38.78	11.33	4.12
Suburban	388	1,107	1,569	406	151
	10.72	30.57	43.33	11.21	4.17
Rural	297	652	996	249	102
	12.94	28.40	43.38	10.84	4.44
Total	7,218	16,577	20,655	5,939	2,175
	13.73	31.54	39.29	11.30	4.14

acteristics of their county. For this analysis, I rely on US Census data through the Department of Agriculture Economic Research Service (ERS). County-level data includes measures of poverty, population, education, and race. Poverty estimates are model-based estimates from the U.S. Census Bureau's Small Area Income and Poverty Estimate (SAIPE) program. Population estimates were collected from the U.S. Census Bureau County Population Estimates. Additionally, I include school financial data through the US Census Bureau 2015 Annual Survey of School System Finances. Due to a collection of schools districts in each county, measures such as local, state, and federal revenue are average estimates among the county. Table 4.1 outlines the key independent variables and the distribution of revenue sources for all counties (and school districts) of individuals in the sample). Table 4.2 outlines these variables for urban counties, table 4.3 outlines these variables for suburban counties, and table 4.2 outlines these variables for rural counties.

Two key independent variables are included to analyze the complementarity relationship between schools and economic opportunity, county level unemployment rates and median household income– both of which reflect local, economic prosperity. These measures were collected at the county level by the Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS) program. These variables measure local area employment opportunity and compensation. The expected relationship between these variable and the dependent variable is that as unemployment rates increase (less work), the demand for education spending decreases. As median household income increases (improved economic activity), the demand for education spending will also increase.d

Variation in the magnitude of these relationships across place would imply a stronger mechanism of inverse demand for education during times of economic hardship. Figure 3.2 illustrates the unemployment rate in 2015 by place and 3.3 illustrates the median household income distribution. In figure 3.2, across each place, the unemployment rate is similar, clustering around 5 percent. However, there is a larger distribution of this variable in the urban sample compared to the suburban and rural sample. Additionally, the median household income is much more widely distributed in the urban and suburban samples (as seen in figure 3.3) than in

the rural sample. Among the rural sample of counties, the local distribution of income is clustered and lacks the long tail of the kernel density function, suggesting that the higher income earnings found in urban areas, and to a degree suburban areas, are not found in rural areas. The underlying question of this analysis is 1) about the effect of these variables as determinant of education spending preferences and 2) if this effect varies by place.

A secondary independent variable is the duration of residence by the individual. This variable is intended to build some understanding of the relationship of movement as a factor in education demand. In particular, does living in a place during a longer time result in increased interest in investment in public education? Additionally, would the relationship between this variable and demand for education vary across place. Control variables include the individual's income level (compared to low-income), age (in 10 years), status as a parent (being a parent=1), an interaction of age and being a parent, education level, gender (female=1), work status (not working=1), status as a homeowner (owner=1), race dummy variables, immigration status (immigrant=1), and ideology scale (increasingly conservative). At the county level, control variables include percent of Black county residents, percent of Hispanic county residents, median income (in 10,000s), percent of county poverty for all residents, and percent of county poverty for all school age children (age 5-17). These variables are largely in line with the redistribution and education literature, but are not the main focus of this analysis.

All data is weighted in these models and presented as odds ratios (meaning a number larger than one is positive and a number less than one is negative). In an ordered logit model, the odds ratio coefficient is the the exponential function of the regression coefficient.

3.5 Results of Demand by Place and Local Economic Conditions

In the first iteration of the model, individual and county-level economic variables are included to predict the preference of increasing state spending on education. Table 3.5.1 displays these results. Odds ratios can be interpreted as percent likelihood, a coefficient above 1 is more likely to prefer an increase in state spending and less than 1 is less likely to prefer. Place

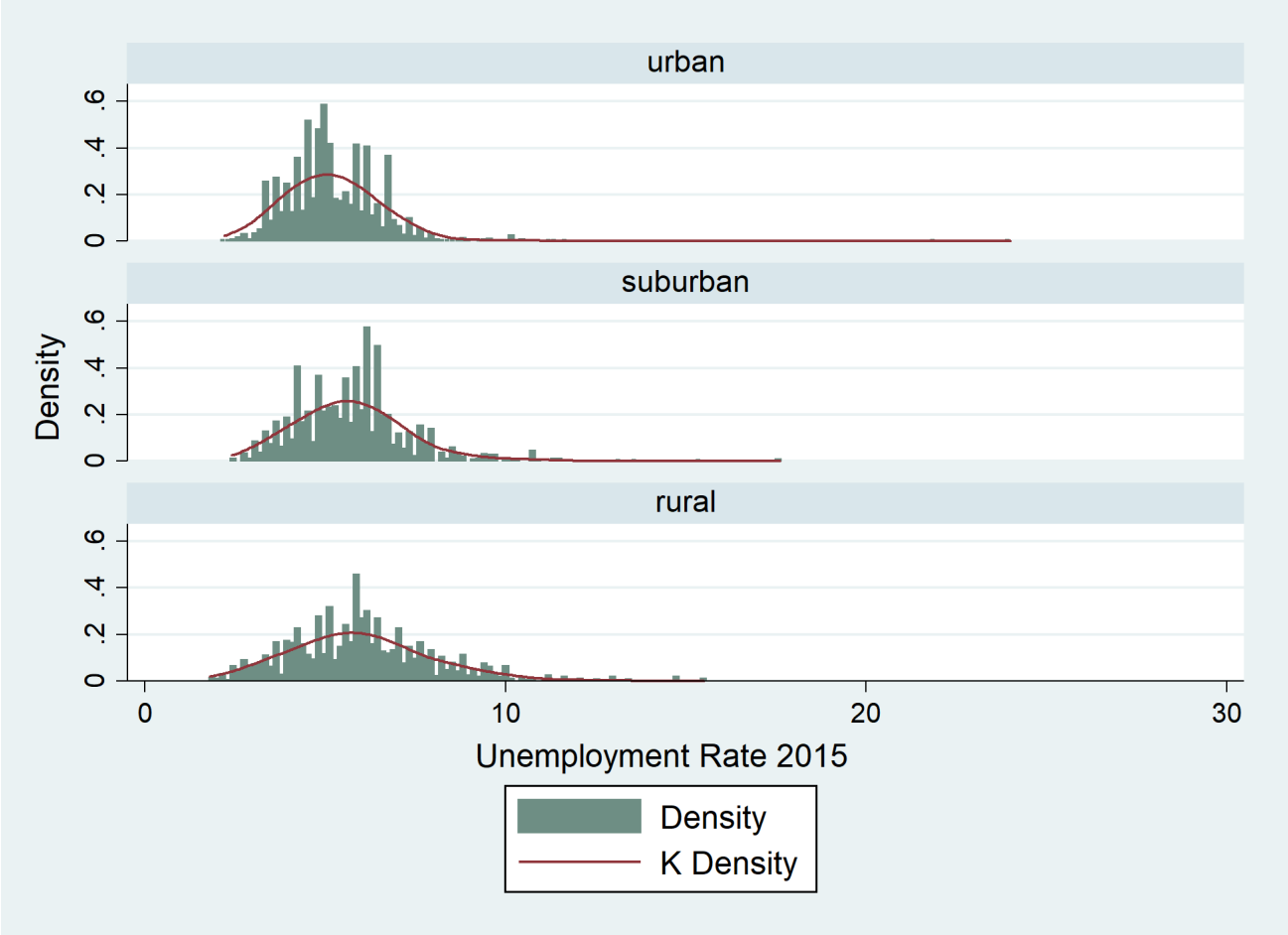

Figure 3.2: 2015 Unemployment Rate Distribution across Urban, Suburban, and Rural Places

Table 3.8: Summary Statistics of Full Sample

Variable	Mean	Std. Dev.	Min.	Max.	N
Unemployment Rate 2015	5.3	1.4	1.8	24	52564
Median Household Income 2015	57816.3	15092.8	23014	125900	52564
Duration of Residence	17.2	15.6	0	100	51269
Percent of Revenue: Federal	8.5	3.7	1.261	57.0	51563
Percent of Revenue: State	46.7	14.0	0	88.0	51563
Percent of Revenue: Local	44.6	15.3	0.612	96.6	51563
Percent of Revenue: Property Tax	29.1	18.2	0	91.9	51563

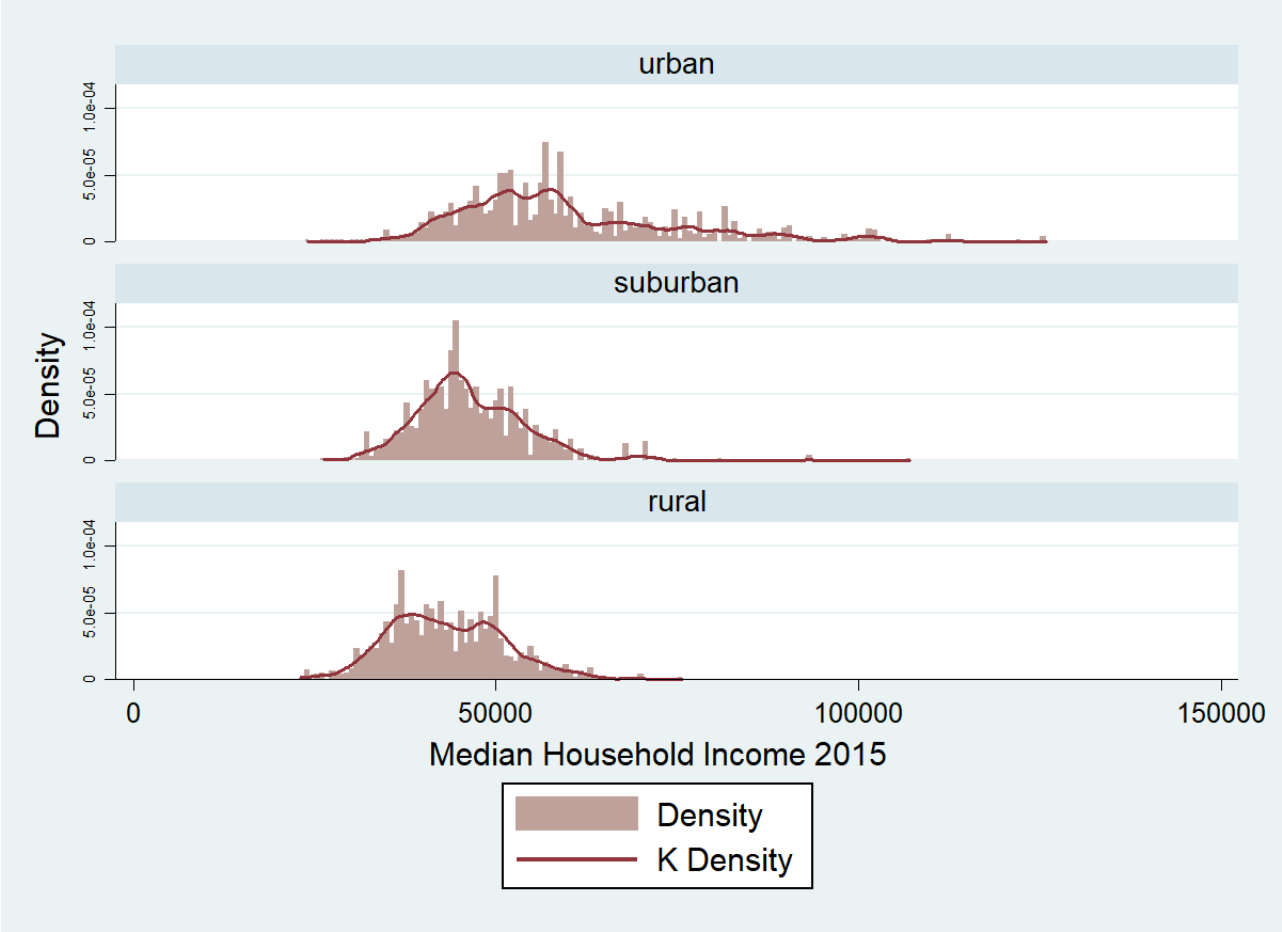

Figure 3.3: 2015 Median Household Income Distribution across Urban, Suburban, and Rural Places

Table 3.9: Summary Statistics of Urban Sample

Variable	Mean	Std. Dev.	Min.	Max.	N
Unemployment Rate 2015	5.2	1.3	2.2	24	46647
Median Household Income 2015	59508.4	15030.9	23968	125900	46647
Duration of Residence	17.168	15.632	0	100	45511
Percent of Revenue: Federal	8.4	3.5	1.2	42.1	45647
Percent of Revenue: State	45.87	13.9	0	88.0	45647
Percent of Revenue: Local	45.71	15.1	2.3	96.6	45647
Percent of Revenue: Property Tax	29.8	18.5	0	86.6	45647

Table 3.10: Summary Statistics of Suburban Sample

Variable	Mean	Std. Dev.	Min.	Max.	N
Unemployment Rate 2015	5.7	1.5	2.4	17.6	3621
Median Household Income 2015	46530.4	7620.9	26218	107126	3621
Duration of Residence	17.4	16.0	0	100	3522
Percent of Revenue: Federal	9.2	4.2	2.7	44.0	3620
Percent of Revenue: State	53.3	12.1	3.7	83.6	3620
Percent of Revenue: Local	37.4	13.3	8.0	93.4	3620
Percent of Revenue: Property Tax	24.1	14.8	0	91.3	3620

Table 3.11: Summary Statistics of Rural Sample

Variable	Mean	Std. Dev.	Min.	Max.	N
Unemployment Rate 2015	6	1.8	1.8	15.5	2296
Median Household Income 2015	43361.5	8048.6	23014	82906	2296
Duration of Residence	17.9	16.0	0	79	2236
Percent of Revenue: Federal	10.0	5.3	1.54	57.0	2296
Percent of Revenue: State	53.3	14.8	3.293	87.3	2296
Percent of Revenue: Local	36.6	16.4	0.6	93.8	2296
Percent of Revenue: Property Tax	25.37	16.8	0	91.9	2296

is included as a dummy variable, comparing counties that are urban and suburban to rural. Compared to urban and suburban counties, being in a rural county reduces the preference for increasing state spending on public education. In the case of the place-based dummy variable, for the rural county group the outcome of preferring an increase in state spending on education is approximately 6% less likely, compared to the urban and suburban county group and holding all variables constant.

The key independent variable is the unemployment rate from the previous year. The hypothesis is that local economic opportunity (less unemployment and higher average income) will positively impact individual demand (spending) on education. The inverse intuition is that as the unemployment rate increases, so does the likelihood of preferring to decrease state spending on education. As the county unemployment rate increases, the likelihood of preferring an increase in state spending on education is approximately 6% less likely, holding all variables constant. This supports the hypothesis of the complementarity effect. As the local economic conditions in employment opportunities decline, so does the preference to increase state spending on local public schools. Furthermore, in the urban and suburban samples, we find that unemployment drives down demand for more public education through increased spending. As the county unemployment rate in the urban sample increases, the likelihood of preferring an increase in state spending on education is approximately 5% less likely, holding all variables constant. More striking, as the county unemployment rate in the suburban sample increases, the likelihood of preferring an increase in state spending on education is approximately 14% less likely, holding all variables constant. This variable is not statistically significant in the rural sample, highlighting that complementarity mechanisms may have a different effect in rural places.

However, the findings for county median income are inverse to the complementarity effect. As the median household income increases, the demand for education will subsequently decrease– rather than increase. As the county median income increases, the likelihood of preferring an increase in state spending on education is approximately 3% less likely, holding all variables constant. This contrasts the hypothesis that greater earnings will generate greater

local investment in education. Rather, as median income increases, we find the opposite effect on spending preferences; individuals prefer to reduce state spending on education. Additionally, duration of living in a place appears to have no effect on the likelihood of preferring increased state spending on education. In this iteration of the model, duration of residence is not significant in any of the specifications.

In order to understand how unemployment and median income earnings impact places in a comparative analysis, I introduce these variables into the model as interaction terms. These are outlined in table 3.5.2. Place is included as a dummy variable, with suburban as the baseline value. Only rural is significant in this model. Compared to the suburban sample, being in a rural county reduces the likelihood of preferring an increase in state spending on education by approximately 61%, holding all variables constant. This finding indicates that compared to suburban places, rural areas are less likely to prefer increased state spending on education. There is no significant difference in median household income. In fact, this variable loses significance when I introduce revenue sources into the model. Unemployment remains significant in this model, although the effect does not differ across place. As the county unemployment rate increases, the likelihood of preferring an increase in state spending on education is approximately 9% less likely, holding all variables constant. It could be argued that the inverse relationship between unemployment and spending on education is not a place-based phenomenon. Regardless of place, this relationship appears to impact this sample of Americans in their preference for state spending on education.

3.5.1 Individual and County Determinants on Education Spending

	Depending Variable: Increase State Spending on Education							
	Total		Urban		Suburban		Rural	
	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.
Place (Increasingly Rural)	0.94**	(0.02)						
Unemployment Rate 2015	0.94***	(0.01)	0.95***	(0.01)	0.86***	(0.03)	0.97	(0.03)
Median Household Income 2015	0.97**	(0.01)	0.96**	(0.01)	1.06	(0.10)	1.08	(0.14)
Duration of Residence	1.00	(0.00)	1.00+	(0.00)	1.00	(0.00)	1.00	(0.00)
Low-Income	0.92**	(0.03)	0.92**	(0.03)	0.75*	(0.11)	1.47+	(0.29)
Middle-Income	0.99	(0.03)	0.99	(0.03)	0.92	(0.13)	1.22	(0.24)
Age (10 years)	0.98*	(0.01)	0.99	(0.01)	0.93**	(0.03)	1.01	(0.04)
Being a Parent	1.79***	(0.15)	1.87***	(0.17)	1.13	(0.38)	2.20*	(0.82)
Parent*Age	0.94**	(0.02)	0.93***	(0.02)	1.05	(0.08)	0.93	(0.08)
Education	1.04***	(0.01)	1.05***	(0.01)	1.04	(0.03)	0.96	(0.03)
Female	1.23***	(0.02)	1.24***	(0.02)	1.17*	(0.09)	1.25*	(0.12)
Not Working	0.91***	(0.02)	0.91***	(0.02)	0.90	(0.07)	0.90	(0.09)
Home Owner	0.77***	(0.02)	0.77***	(0.02)	0.67***	(0.06)	0.93	(0.11)
White	1.17***	(0.04)	1.16***	(0.04)	1.92***	(0.37)	1.03	(0.24)
Black	2.56***	(0.12)	2.49***	(0.12)	5.06***	(1.36)	3.23***	(1.03)
Hispanic	1.73***	(0.09)	1.69***	(0.09)	5.40***	(1.76)	1.46	(0.70)
Immigrant	0.98	(0.04)	0.98	(0.04)	1.48	(0.41)	0.75	(0.20)
Ideology Scale	0.66***	(0.01)	0.65***	(0.01)	0.72***	(0.02)	0.76***	(0.03)
County Percent Black	1.14	(0.12)	1.21+	(0.13)	0.91	(0.41)	0.41+	(0.19)
County Percent Hispanic	1.16*	(0.09)	1.12	(0.09)	4.70***	(2.02)	2.06	(1.36)
Percent in Poverty 2015	1.04***	(0.01)	1.04***	(0.01)	1.05**	(0.02)	1.02	(0.02)
Percent of Families w/ Children in Poverty 2015	0.99*	(0.00)	0.99*	(0.00)	1.01	(0.01)	1.01	(0.02)
County Fixed Effects	*yes*		*yes*		*yes*		*yes*	
R2	0.05		0.04		0.11		0.10	
N	44539		39426		3116		1997	

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.5.2 Determinants on Education Spending with Interactions

Dependent Variable: Increase State Spending on Education Full Sample (urban, suburban, and rural)		
	coef.	s.e.
Urban	0.66	(0.25)
Rural	0.39^{+}	(0.22)
Unemployment Rate 2015	0.91***	(0.02)
Urban $\times$ Unemployment Rate 2015	1.04	(0.03)
Rural $\times$ Unemployment Rate 2015	1.06	(0.04)
Median Household Income 2015	0.93	(0.05)
Urban $\times$ Median Household Income 2015	1.05	(0.06)
Rural $\times$ Median Household Income 2015	1.12	(0.10)
Duration of Residence	1.00	(0.00)
Low-Income	0.92**	(0.03)
Middle-Income	0.99	(0.03)
Age (10 years)	0.98*	(0.01)
Being a Parent	1.78***	(0.15)
Parent*Age	0.94**	(0.02)
Education	1.04***	(0.01)
Female	1.23***	(0.02)
Not Working	0.91***	(0.02)
Home Owner	0.77***	(0.02)
White	1.17***	(0.04)
Black	2.57***	(0.13)
Hispanic	1.70***	(0.09)
Immigrant	0.98	(0.04)
Ideology Scale (Increasingly Conservative)	0.66***	(0.01)
County Percent Black	1.09	(0.11)
County Percent Hispanic	1.13	(0.09)
Percent in Poverty 2015	1.04***	(0.01)
Percent of Families w/ Children in Poverty 2015	0.99**	(0.00)
Percent of Revenue: Federal	1.02***	(0.00)
Percent of Revenue: State	1.00	(0.00)
County Fixed Effects	*yes*	
R2	0.05	
N	39440	

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.6 Results of Grading Schools by Place and Local Economic Conditions

In the second iteration of the model, individual and county-level economic variables are included to predict how an individual will grade their local public schools. Survey respondents are asked to grade their local public goods including schools, police, zoning, mayor, and city council. The scale of these grades follow those used in American school systems, with A representing excellent and F representing failure. The key dependent variable is this grade for public schools. However, to control for preferences that might generally mark all items in the same manner, the other local public goods are included in the analysis. This is a way of controlling for survey responses that might not fully reflect preferences. The order of these values are one (1) equivalent to failure (F) and five (5) equivalent to excellent (A). Thus, the interpretation of these grading (or valuing) variables is that as an individual grades a public good higher (towards excellent), the estimated effect will also improve the grading of local public schools (towards excellent).

Table 3.6.1 displays the result of the full survey sample and each place-based sample. As in the first models that estimate spending on education, the key independent variables are the unemployment rate and median household income (measured from the previous year, 2015). The hypothesis is that local economic opportunity (less unemployment and higher average income) will positively impact how individuals value and grade their local education institutions. This is another way to get at the notion of the complementarity effect in spending preferences.

As before, Table 3.6.1 outlines the findings from the model run with the full sample and then, each place-based samples. In this iteration of the full model, place is significant in how individuals grade their local schools. As a place moves from urban to rural, the grading of local schools increases. Compared to urban and suburban counties, being in a rural county increases an individual's grading of their local schools, effectively moving towards an A mark which represents excellent. In the case of the place-based dummy variable, being in a rural increases the likelihood of grading your local school excellent by approximately 22%, holding all variables constant.

The intuition between this form of estimating the complementarity effect is that as local

economic conditions improve, the grading of local schools (as a proxy for valuation) will subsequently improve. The results of this model differ strikingly to those in the model for spending preferences. In this model, the unemployment rate is not statistically significant. However, county median household income is significant and positive. As the county median income increases, the likelihood of grading your local school excellent also increases by approximately 11%, holding all variables constant. Duration of residence is also not significant. However, among the rural sample, living in a place for a longer duration results in a higher grade for local schools. Among rural respondents, living in a county longer increases the likelihood that an individual will grade their local schools as excellent by approximately 1%.

Among control variables, the county level variables are highly significant in this model. Increasing the percent of non-white community members reduces the grade that individuals give their public schools. The poverty indicators at the county-level estimate inverse effects on public school grades. Increasing the percentage of families in poverty within a county is associated with better grades for local schools. In contrast, increasing the number of children in poverty within a county is associated with worse grades for local schools. All variables of other public good values are positive and significant (although low in magnitude). The largest effect is valuing police as a public good with a positive impression is associated with higher likelihood of grading public schools as excellent.

Table 3.6.2 illustrates the interactions of key variables with place in grading local public schools. Among the place variable (suburban is again the baseline variable), these are not statistically significant. There is no indication of statistical differences among these variables when estimating grades for schools. Median income is also insignificant in this model. However, when interacted with place, there is a statistically significant difference between the rural and suburban samples. Compared to the suburban sample, being in a rural county increases the likelihood of grading your local schools as excellent by approximately 20%, holding all variables constant. The unemployment rate remains insignificant in this model and while the duration of residence is significant, the effect is close to zero.

3.6.1 Individual and County Determinants on Grading Public Schools

	Depending Variable: Increase Grade on Public Education							
	Total		Urban		Suburban		Rural	
	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.
Place (Increasingly Rural)	1.22***	(0.03)						
Unemployment Rate 2015	1.00	(0.01)	1.00	(0.01)	1.04	(0.04)	0.99	(0.03)
Median Household Income 2015	1.11***	(0.01)	1.12***	(0.01)	0.98	(0.10)	1.15	(0.15)
Duration of Residence	1.00*	(0.00)	1.00*	(0.00)	1.00	(0.00)	1.01*	(0.00)
Low-Income	0.90***	(0.03)	0.89***	(0.03)	1.15	(0.17)	0.87	(0.18)
Middle-Income	0.86***	(0.02)	0.86***	(0.03)	1.13	(0.17)	0.70+	(0.15)
Age (10 years)	1.02*	(0.01)	1.01+	(0.01)	1.06*	(0.03)	1.05	(0.04)
Being a Parent	1.72***	(0.15)	1.78***	(0.16)	1.34	(0.46)	1.49	(0.60)
Parent*Age	0.93***	(0.02)	0.93***	(0.02)	0.98	(0.08)	0.94	(0.08)
Education	1.01	(0.01)	1.01	(0.01)	0.99	(0.03)	0.97	(0.04)
Female	0.94**	(0.02)	0.93***	(0.02)	0.99	(0.08)	1.10	(0.11)
Not Working	0.99	(0.02)	0.98	(0.02)	1.12	(0.09)	0.98	(0.11)
Home Owner	1.18***	(0.03)	1.19***	(0.03)	1.00	(0.09)	1.24+	(0.15)
White	1.10*	(0.04)	1.12**	(0.04)	0.53**	(0.11)	1.85**	(0.44)
Black	1.44***	(0.07)	1.45***	(0.07)	1.35	(0.38)	1.91*	(0.61)
Hispanic	1.40***	(0.07)	1.41***	(0.08)	0.82	(0.26)	1.19	(0.60)
Immigrant	1.09*	(0.04)	1.11**	(0.04)	1.12	(0.29)	0.53*	(0.14)
Ideology Scale (Increasingly Conservative)	0.94***	(0.01)	0.94***	(0.01)	0.95+	(0.03)	0.83***	(0.03)
County Percent Black	0.43***	(0.04)	0.40***	(0.04)	0.31**	(0.14)	0.72	(0.35)
County Percent Hispanic	0.71***	(0.06)	0.66***	(0.05)	0.79	(0.33)	0.68	(0.48)
Percent in Poverty 2015	1.02***	(0.01)	1.02**	(0.01)	1.05**	(0.02)	0.99	(0.02)
Percent of Families w/ Children in Poverty 2015	0.97***	(0.00)	0.98***	(0.00)	0.93***	(0.01)	0.97	(0.02)
Grading: Police	2.41***	(0.03)	2.41***	(0.03)	2.54***	(0.14)	2.43***	(0.15)
Grading: Roads	1.31***	(0.02)	1.31***	(0.02)	1.32***	(0.07)	1.27***	(0.08)
Grading: Zoning	1.30***	(0.02)	1.30***	(0.02)	1.35***	(0.08)	1.19*	(0.09)
Grading: Mayor	1.14***	(0.02)	1.14***	(0.02)	1.09	(0.07)	1.28**	(0.10)
Grading: City Council	1.39***	(0.02)	1.39***	(0.03)	1.47***	(0.10)	1.32**	(0.11)
County Fixed Effects	*yes*		*yes*		*yes*		*yes*	
R2	0.16		0.15		0.22		0.22	
N	43936		38888		3072		1976	

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.6.2 Determinants on Grading Public Education with Interactions

Dependent Variable: Increase Grade on Public Education Full Sample (urban, suburban, and rural)		
	coef.	s.e.
Urban	0.63	(0.25)
Rural	0.64	(0.38)
Median Household Income 2015	1.06	(0.06)
Urban × Median Household Income 2015	1.05	(0.06)
Rural × Median Household Income 2015	1.20*	(0.11)
Unemployment Rate 2015	0.99	(0.03)
Urban × Unemployment Rate 2015	1.01	(0.03)
Rural × Unemployment Rate 2015	0.99	(0.04)
Duration of Residence	1.00*	(0.00)
Low-Income	0.90***	(0.03)
Middle-Income	0.86***	(0.02)
Age (10 years)	1.02*	(0.01)
Being a Parent	1.73***	(0.15)
Parent*Age	0.93***	(0.02)
Education	1.01	(0.01)
Female	0.94**	(0.02)
Not Working	0.99	(0.02)
Home Owner	1.18***	(0.03)
White	1.10*	(0.04)
Black	1.44***	(0.07)
Hispanic	1.40***	(0.07)
Immigrant	1.09*	(0.04)
Ideology Scale (Increasingly Conservative)	0.94***	(0.01)
County Percent Black	0.42***	(0.04)
County Percent Hispanic	0.69***	(0.06)
Percent in Poverty 2015	1.02***	(0.01)
Percent Families in Poverty 2015	0.97***	(0.00)
Grading: Police	2.41***	(0.03)
Grading: Roads	1.31***	(0.02)
Grading: Zoning	1.30***	(0.02)
Grading: Mayor	1.14***	(0.02)
Grading: City Council	1.39***	(0.02)
County Fixed Effects	*yes*	
R2	0.16	
N	40205	

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.7 Conclusion

In this paper, I analyze the role of place in preferences for spending on public education. First, this analysis considers the effect of movement as a form of spatial sorting. Outlining the descriptive statistics of the 2016 CCES survey data, rates of movement among individuals and places are outlined. Among each place, I find that the rate of movement is consistent. These findings show that individuals move at comparable rates. This means that both theories of movement (self-sorting and income constraints) generally lead to similar effects in terms of movement across each place-based distinction. Indeed, once the data is separated along income lines, I find similar rates of movement hold across place. While I find an increase in movement among young people, these rates remain comparable across place. This indicates that movement patterns are not necessarily an urban or rural phenomenon. An individual could either choose to move or be unable to move between places. However, this does not detract from the argument that local economic conditions would center an individual's preference for school funding. In both cases, preferences will likely be a local calculation.

To consider this local calculation, I examine the complementarity nature of public goods, in this case, public education. The logic is that public education will be driven by local benefits, more specifically, employment and higher earnings. Simply put, local public education will be more valuable to individuals when there is increased local employment and better earnings. For the empirical analysis, I rely on individual level survey data nested in counties. This requires the employment of an ordered logit model including cluster-specific fixed effects. The first iterations of models tests the relationship between key variables and demand for education (expressed as a preference to increase state spending on education). The second iteration of the models tests the relationship between local benefits and valuing public education, expressed as a grade for public schools (literally, school grade scales of F (failure) to A (excellent)).

In the models estimating preferences for education spending, I find that increasing the unemployment rate results in a decreased likelihood of preferring more state spending on education. The hypothesis is that local economic opportunity (more employment) will positively impact individual demand (spending) on education. I find support for this hypothesis by a ro-

bust inverse coefficient that indicates local economic conditions impact state spending preferences by individuals on local public schools. However, this does not statistically differ between urban, suburban, and rural counties. In contrast, I find that as median household income increases, individuals express a preference to decrease state spending on education. In this case, I do not find support for the complementarity nature of public education preferences. These findings show that the effect of employment and earnings may generate unique preferences for education spending. While higher employment leads to decreased demand, higher income also leads to decreased demand. Additionally, I consider the duration of residence as a determinant and find that this variable is not statistically significant. This means that living in a place longer does not factor into an individual's demand for public education.

In the next model, I interact key variables with place (urban, rural, and suburban) which serves as the base category. Including place as an interaction variable allows for comparison across models, effectively testing whether the effect of key variables (unemployment rate and median household income) is different in each of the three locations. In these models, there is no statistical difference in the relationships between key variables and place-based categories. Comparing urban and rural places to suburban areas indicates no difference in the magnitude of effect. Furthermore, I also run these models comparing urban and suburban to rural or suburban and rural to urban with no statistical difference found. While the notion that complementarity effects impact preferences for educational spending is consistent in terms of the unemployment rate, these latter findings suggest that, among survey respondents defined by place, there is no difference. In effect, respondents are more similar in this estimation than different. Unemployment drives down demand for state spending, but does not vary across place. In this regard, rural Americans are no different than their urban or suburban counterparts.

Finally, I analyze how these key variables may correlate to the grading of local public goods. Survey respondents are asked to grade their local public schools with a score ranging from F (failure) to A (excellent). I find that more rural places are related to higher grading of their public schools. In this estimation, rural Americans hold a higher value for their public educational institutions. Additionally, as median household income increases, the grading of

local public schools also increases. Thus, earnings correlate to more positive perceptions of local public schools. However, when I add these key variables to the place-based categories, I do not find a statistically significant difference in these estimation effects. Again, while the effect of economic complementarity factors appear to impact how individuals value the quality of their public schools, individuals are found to be more similar than different. Again, rural Americans are no different than their urban and suburban counterparts.

These findings suggest that individuals value education differently due to their ability to turn educational attainment into economic prosperity, a reflection of complementary considerations. While the preferences between urban, suburban, and rural individuals may vary based on a variety of factors, the current categories of place do not fully capture preference variation between individuals. Rather, the findings from this study illustrate more commonalities between individuals. The results suggest shared experiences by Americans, more specifically, that demand for more spending in public education is inversely linked to local economic opportunity. In contrast, median household income improves how individuals grade (and value the quality of) their public schools but this variable, across place, results in less demand for additional state spending.

CHAPTER 4

VOTING FOR PUBLIC SCHOOLS: ANALYZING TEXAS BOND ELECTIONS ACROSS THE URBAN-RURAL DIVIDE

4.1 Overview

In the United States, public schools are funded through varying formulas of federal, state, and local revenue. In addition, school funds for capital-improvement, renovations, or technological improvements are used by school districts to generate additional funds. School bonds are debt taken on by the school district and must be approved by voters through a simple majority, or fifty percent of voters. The occurrence of school bond elections is a case in which public finance decisions and collective election outcomes intersect in the policy arena. This provides a unique opportunity to analyze the nature of collective decision-making for the funding of a public, or publicly-provided, good as well as examine the underlying factors that may differ across communities and dictate election outcomes. This article presents an analysis of place-based preferences through a comparison of urban and rural election outcomes for school bond measures. In particular, this work focuses on the underlying factors that differentially determine individual preferences based on where one lives. Through the analysis of school bond elections, it is possible to underscore variation in election outcomes across place. The intersection of voters and funding is useful in understanding collective decision-making and the institutional (community) arrangement in which decisions are made.

Understanding political institutions, such as elections, is useful in understanding how political institutions impact the public. Derived from Browne (2001), institutions are created through tradition and political action. They govern behavior, specify who bears risks, and have

a bias towards one interest over others. The objective of this study is to increase understanding about the interaction between demographic characteristics (income, age, race, etc.) as factors in election outcomes across place (urban versus rural). Demographic changes across place may affect voters differently in their preferences for schools bonds. For example, rural American locales have long struggled with population decline. Rural populations tend to be older than urban and suburban areas (Johnson, 2013). Poverty also tends to be higher in non-metropolitan counties than in metropolitan counties (Farrigan et al., 2014). Finally, while rural America is mainly white, rural minority groups tend to remain concentrated near historical institutions that subjugated these groups (Rural Sociological Society, 1993). Considerations of how many residents pay, who among them pays, and finally, who benefits from public spending can impact whether individuals support passage of a bond.

Additionally, the needs of rural schools vary from those in urban places. The amount spent per pupil is generally higher in urban areas than in rural communities, even when other economic and social factors are comparable. Both access to education and educational gains also impact populations also vary across place. Broadly speaking, as *rurality* increases, the percentage of rural adults with higher education decreases. Rural educational gains also vary across demographic groups; rural women are more educated than rural men and rural whites are more educated than racial and ethnic minorities (Marré, 2017). Nearly 79 percent of counties deemed as "low education" are rural (Marré, 2017). Low educational attainment in rural places is also closely related to higher poverty and child poverty rates as well as higher unemployment rates and lower earnings. Each of these factors may drive election outcomes differently as populations deal with demographic change in their communities and educational systems.

Relying on a unique dataset, this study will begin with an analysis of the state of Texas. Data includes all elections from the year 2000-2016 across all school districts in Texas. The Texas dataset, accessed through the Texas Bond Review Board, has been the subject of past analyses of bond election determinants. Bowers and Lee (2013) analyze Texas bond elections (1997-2009) to determine the factors that are more associated with bond passage, including place-based characteristics such as city or town and demographic characteristics such as per-

cent of minority students. Building off this study, I include the comparison of urban versus rural districts to consider how demographic changes captured by these place-based characteristics impact bond election outcomes. To assess these effects, including how they comparatively affect election outcomes, I estimate time-series logit models on the likelihood of bond passage, based on change in school district composition and county-level economic indicators.

I find that communities with higher median income are more likely to pass bond elections. As the local economy improves, so does the odds of passing a school bond. However, there is no difference in the effect of this variable between rural and urban districts– meaning this is not a phenomenon to one place. In each of the models, there is no effect based on older cohorts (in rural areas) compared to younger cohorts (in urban areas). I also find support that communities with more diverse students populations (in particular, rising rates of Hispanic students) increases the likelihood of passing a school bond measure. However, like median income, there is also no statistical difference across place.

4.2 Literature

In 2017, 50.7 million children attended public elementary and secondary schools, costing the nation roughly $623.5 billion for the school year (resulting in an average expenditure of $12,300 per student) (National Center for Education Statistics, 2018). While only about 10 percent of education funding is through the federal government, the remaining money is received through local and state taxes. At the local level, this revenue is primarily generated through property taxes and at the state level, mainly through state income taxes. Funding formulas at the state and local level vary across states, however, states typically employ a method for targeting funding to districts based on student characteristics (special education, English language learners, economic disadvantage, and concentration of low-income students) (Chingos and Blagg, 2017). A supplement to these funds are local bond elections in which citizens directly vote to increase funding, through a form of district-wide debt.

Voter behavior has mainly been understood as a general expression of self-interest (Sears and Citrin, 1982; Brodsky and Thompson III, 1993; Shabman and Stephenson, 1994). In stud-

ies on school financing, income is the common way in which self-interest from schools is operationalized. The influential research of Piele and Hall (1973a) and Piele and Hall (1973b) on voter behavior and school finance elections highlighted *partial-theories* of factors that impact bond election outcomes. The authors find that school district characteristics (amount of bond, per pupil expenditure), voter demographic characteristics (age, income), and election characteristics (time of year, turnout) all determine bond outcomes.

However, age is another consideration when we consider voters at the ballot box deciding to increase funding for public schools. This is known as the "Gray Peril" hypothesis which asserts that aging citizens will be less likely to support funding public goods, such as education, because they do not directly benefit (Serow, 2003). Studies have found mixed evidence of this phenomenon; some support the notion (Poterba, 1997; Cattaneo and Wolter, 2009) while others find inconclusive results (Duncombe et al., 2003; Berkman and Plutzer, 2004). Lambert et al. (2009) find support for the notion that funding for local public education is different in counties that attract and retain seniors in large numbers, as opposed to those that do not.

Bowers et al. (2010b) analyze the factors that are mainly associated with the passage of school bonds by local district elections. The authors find that the bond amount, percentage of students receiving free and reduced lunch, voter turnout, and a low placement on the ballot negatively impact the likelihood of passage. Further, the authors find that being in a small town or rural community also reduces the likelihood of passage. Bowers et al. (2010a) analyze the parameters driving the success of passing a bond measure. The authors find that *urbanicity* is a key factor. More specifically, rural districts have worse chances of passing bond elections than urban and suburban districts. In an analysis of school spending equity, (Zimmer and Jones, 2005) find that high-spending districts have greater probability of issuing bonds after policy change for greater equity.

This article uses the urban-rural lens to highlight the dynamics which allow some communities to overcome collective action problems around funding a public good– one where only a portion of the population directly benefits. Ostrom (2000) highlights the importance of institutions (consider communities, elections, and place) as a determinant in understand-

ing co-production, or the ways in which citizens (consumers in economic terms) participate in the production of public goods or services, such as education. Olson (1965) argues that communities face dilemmas of participation because some individuals will withhold contributions. While this might be rational on the individual level, it produces a collectively irrational outcome. Overcoming these dilemmas falls into the realm of the public choice theory which argues that individuals are rational human beings that seek to maximize their utility (Mueller, 2003). The basic idea is that individuals reveal their preferences at the ballot box. However, considering that the outcomes are at the collective level, certain factors might deter individuals from overcoming collective action problems.

Group identity, particularly around race distinctions, has been asserted as a factor in perpetuating collective action problems around public goods. Habyarimana et al. (2007) argue that ethnicity matters. However, the authors find that individuals of the same group cooperate due to within-group norms and institutions with lead to successful collective endeavors. Boustan et al. (2010), in contrast, find that spending and levels of public goods increase in diverse communities. Silverman (2011) analyzes bond elections in New York and finds that districts with a higher percentage of minority residents are less likely to pass budget referendums. These findings counter the notion that group diversity, in this case racial groups, creates negative outcomes for collective action. Rugh and Trounstine (2011) analyze bond elections in diverse communities finding that less bonds are proposed, yet these bonds pass at a higher rate.

The literature provides a basis for the theoretical underpinnings of this article. The central question of this research asks how the determinants for passing local bonds through elections vary across place. More specifically, the effects that we expect to drive collective outcomes (income, age, and racial diversity) will be measured across place as factors in the likelihood of passing bond measures for local public schools. The income effect draws on the self-interest of rational voters. The age effect will test the variation in demographic shifts across populations and consider how this maps into the likelihood of passing additional funding for schools. Finally, the race effect will consider how changing group identities by the beneficiaries of education impact the collective outcomes of bond elections across place. These

variables are key in understanding how the demand side for public education may shift. This provides for the following hypotheses which will be analyzed through the comparison of urban and rural communities:

Hypothesis 1: Communities with higher incomes (measured by median income) will be less likely to pass bond measures.

Hypothesis 2: Communities with older cohorts (measured by median age) will be less likely to pass bond measures.

Hypothesis 3: Communities with more diverse student populations (measured by minority percentage) will be more likely to pass bond measures.

4.3 Analysis

Primary data was collected through the state of Texas Bond Review Board. This dataset included all bond elections from 2002-2016 by independent school districts in the state, creating an unbalanced panel dataset. Ultimately, due to limitations of matching data, only the years 2002-2016 were used for estimation. This data includes county of the school district, total required amount, purpose of election, total number of votes, and breakdown of support and opposition in the election. At the county level, election data was merged with demographic data. Population estimates were collected through the Economic Research Service of the Department of Agriculture. Median Household Income and poverty data was collected through the US Census Bureau Small Area Income and Poverty Estimates Program (SAIPE). At the school district level, data was merged with school characteristics and public finance variables. School characteristic data was collected from the National Center for Education Statistics Common Core of Data. Additional public finance variables were collected from the Texas Bond Review Board. This dataset includes a total of 2,213 elections in local school districts throughout Texas. Using the designation of urban and rural counties provided by the Texas Department of State Health Services, counties were then coded as urban/rural and border/non-border, displayed in figure 4.1. Table 4.1 outlines descriptive statistics of key variables of all districts in

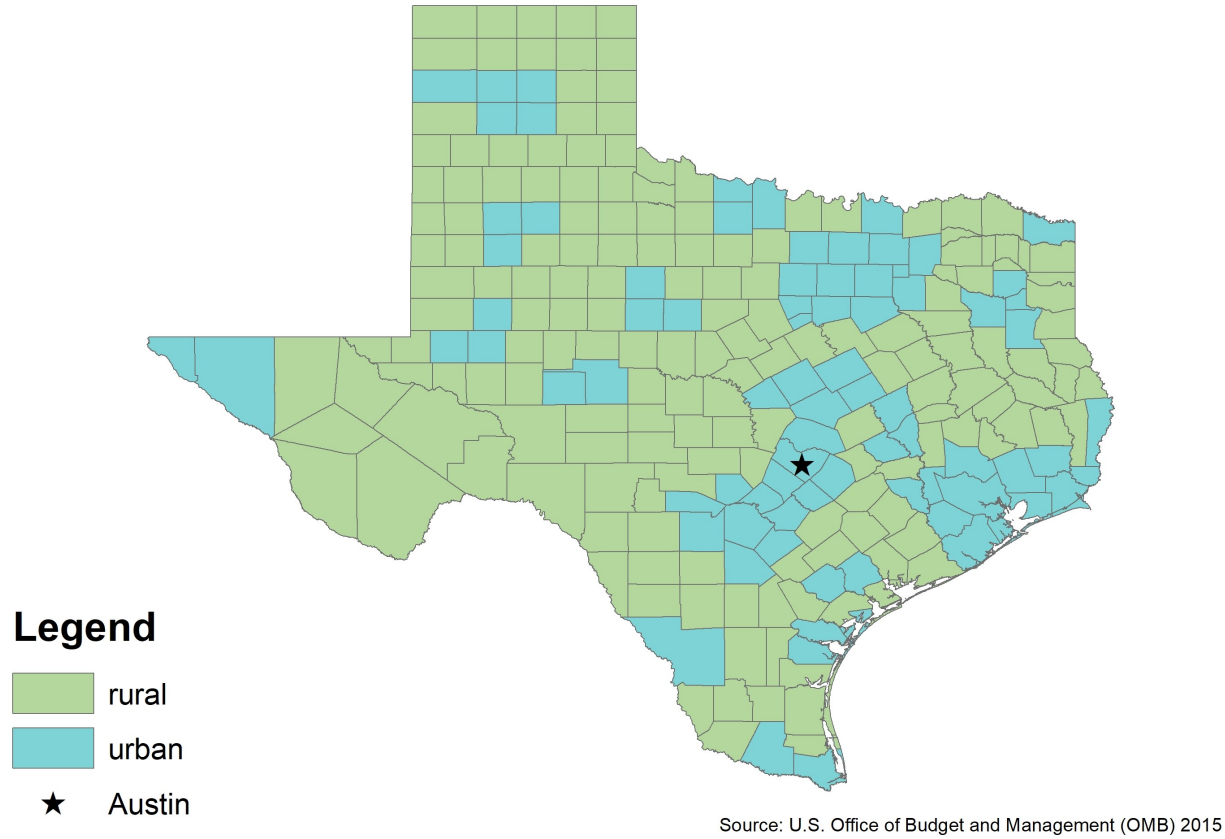

Figure 4.1: Urban and Rural Texas Counties, 2015

the state of Texas. Table 4.2 provides the descriptive statistics of rural districts and table 4.3 outlines the urban districts.

Bond amounts are greatest among the urban sample, with an average required amount of approximately greater than 70 million dollars. In contrast, the proposed amount for the bond in the rural sample is on-average approximately greater than 1 million dollars. The margin for carried bonds is generally the same across the urban and rural sample, however, the percent of carried bonds is highest in the urban sample (74.8 percent) compared to the rural sample (70.7 percent). Urban districts propose more costly bonds, have a higher likelihood of passing the bonds, and carry the most outstanding debt. The distribution of bond requests across urban and rural counties are displayed in figure 4.2. Figure 4.3 displays the trends in bonds over time.

Median income, on average and over time, is highest in urban areas, compared to rural

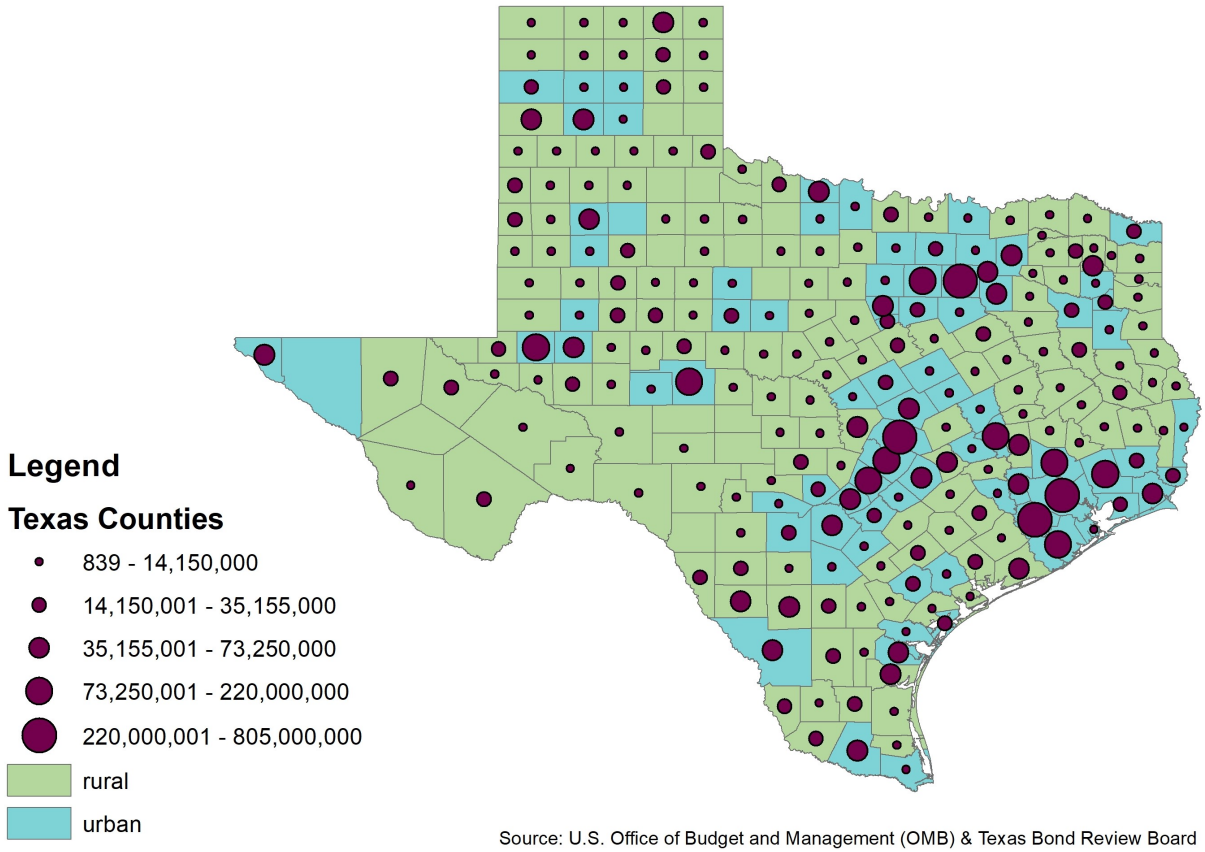

Figure 4.2: Total Bond Requests across Urban and Rural Texas Counties, 2002-2016

areas. Figure 4.4 illustrates the distribution of median income across each place-based category. Median Age in rural districts is highest in the rural sample, with a mean age of 37.9 years compared to 33.5 in urban areas. Figure 4.5 illustrates the distribution of median age across each place type. In contrast, the poverty rate is minimally higher in rural counties compared to urban counties. Figure 4.6 shows how the poverty rate has changed over time in each of these district types. Figure 4.7, figure 4.8, and figure 4.9 show the make-up of non-white students in each district. Among districts, the percentage of Hispanic students that make up the student body are similar, around 35 percent in each. Urban districts have a slightly higher percentage of Black students, while rural districts have a higher percentage of American Indian students.

Table 4.1: Summary Statistics of Texas Districts

Variable	Mean	Std. Dev.	Min.	Max.	N
Bond Passage Rate	0.71	0.44	0	1	2213
Proposed Bond Amount	4,9092,162	117,722,828	839	1,890,000,000	2,213
County Median Income	44,213	11,949	17,239	87,901	2,213
County Median Age	35.2	4.62	22	55	2,213
County Poverty Rate	0.18	0.21	0.002	3.42	2,213
Debt Service Outstanding	132,704,891	319,608,325	0	4,236,902,532	2,213
Rate of Hispanic Students	0.35	0.267	0.01	0.999	2,209
Rate of Black Students	0.09	0.12	0	0.86	2,209
Rate of American Indian Students	0.01	0.01	0	0.28	2,209
Total Number of Students	7730	16,957	61	210,950	2,213

4.3.1 Empirical Method

The central question of this paper is concerned with the likelihood of passing local bonds for public schools. Is the likelihood of bond passage constant across place or is there variation in collective outcomes across place? If the likelihood of bond passage varies across place, what are the main variables by which collective preferences depend? To analyze these questions, I employ a series of logit regression models. The dependent variable is the passage or failure of the bond measure in each school district; a discrete choice model. Throughout the time-series (2000-2016), some school districts proposed multiple bonds to voters. Further, some school

Table 4.2: Summary Statistics of Rural Districts

Variable	Mean	Std. Dev.	Min.	Max.	N
Bond Passage Rate	0.69	0.45	0	1	820
Proposed Bond Amount	12,251,510	15,143,508	839	150,000,000	820
County Median Income	38,052	7,498	17,239	70,127	820
County Median Age	37.9	4.7	25	55	820
County Poverty Rate	0.18	0.14	0.002	1.483	820
Debt Service Outstanding	14,053,850	21,736,763	0	185,960,929	820
Rate of Hispanic Students	0.35	0.26	0.01	0.999	818
Rate of Black Students	0.07	0.10	0	0.59	818
Rate of American Indian Students	0.01	0.02	0	0.28	818
Total Number of Students	1,391	1,533	61	13,808	820

Table 4.3: Summary Statistics of Urban Districts

Variable	Mean	Std. Dev.	Min.	Max.	N
Bond Passage Rate	0.72	0.43	0	1	1,393
Proposed Bond Amount	70,778,691	143,587,752	150,000	1,890,000,000	1,393
County Median Income	47,839	12,581,	24,115	87,901	1,393
County Median Age	33.5	3.65	22	49	1,393
County Poverty Rate	0.17	0.24	0.01	3.42	1,393
Debt Service Outstanding	202,549,724	385,837,829	0	4,236,902,532	1,393
Rate of Hispanic Students	0.35	0.28	0.01	0.999	1,391
Rate of Black Students	0.10	0.13	0	0.86	1,391
Rate of American Indian Students	0.004	0.004	0	0.07	1,391
Total Number of Students	11,461	20,443	95	210,950	1,393

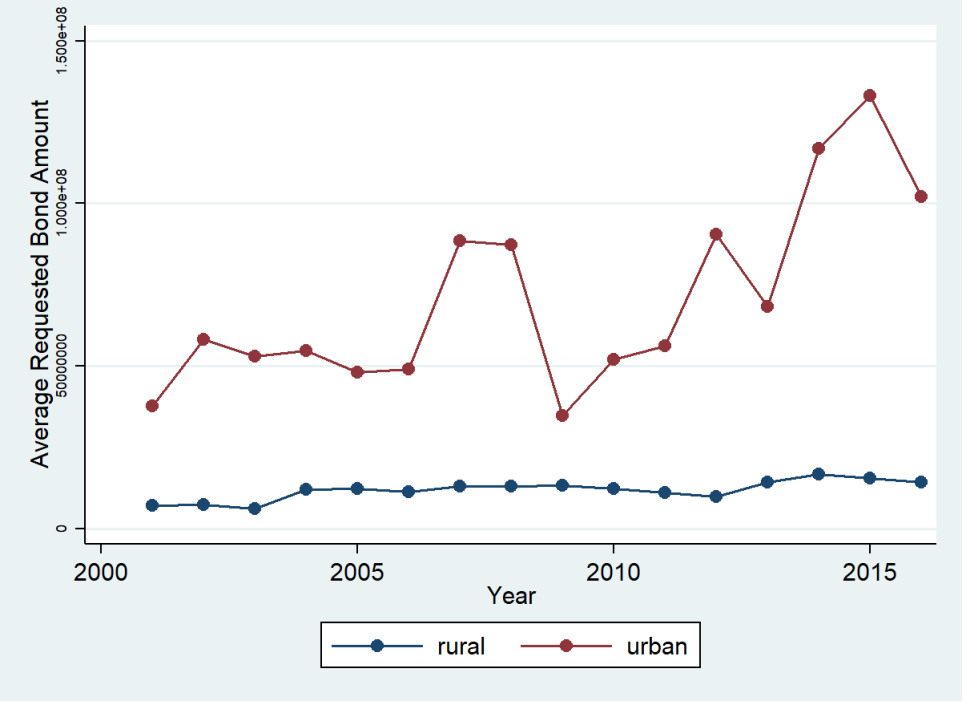

Figure 4.3: Average Requested Bond Amounts Across Urban and Rural Districts

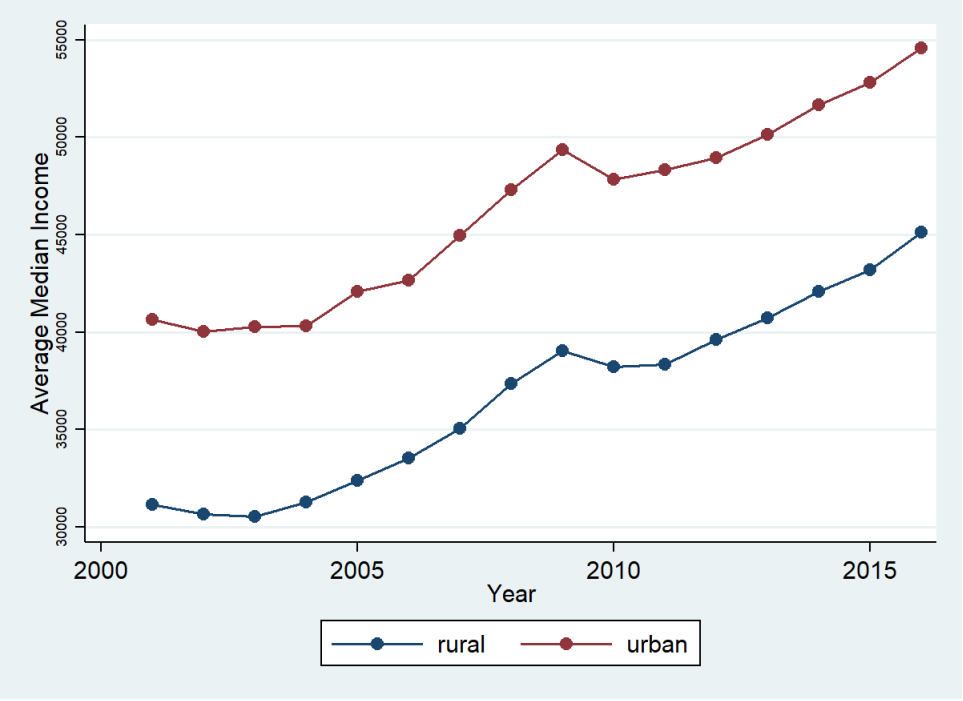

Figure 4.4: Average of County Median Income Across Urban and Rural Districts

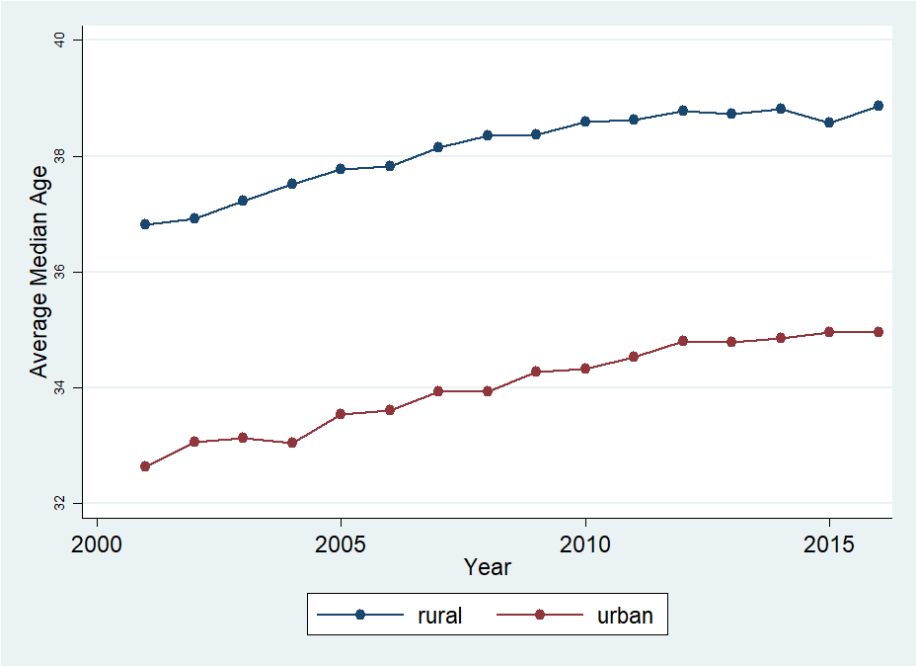

Figure 4.5: Average of Median Age Across Urban and Rural Districts

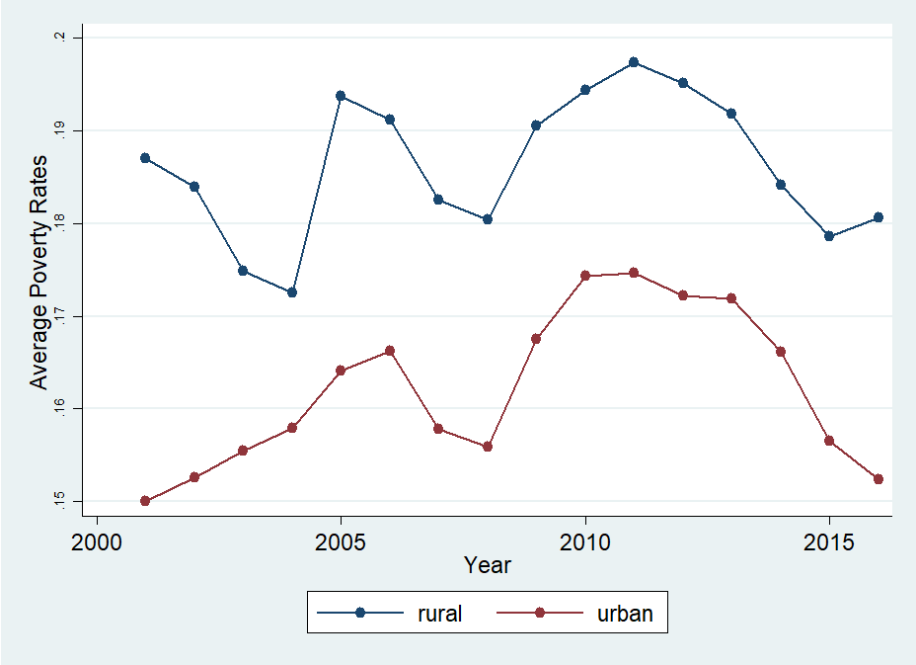

Figure 4.6: Poverty Rates of Urban and Rural Districts

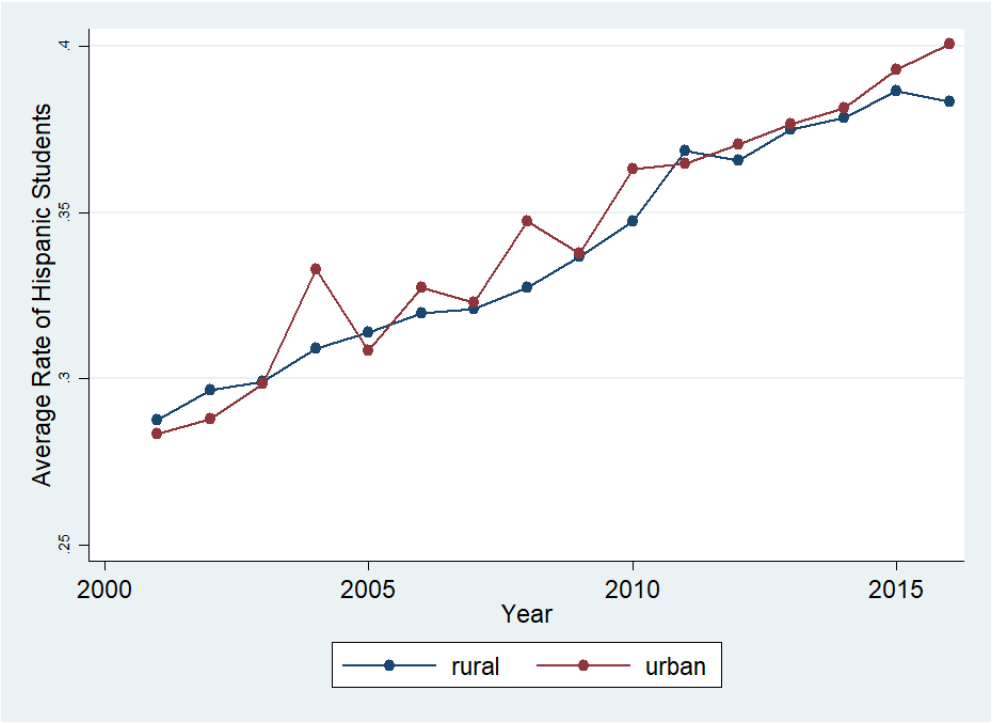

Figure 4.7: Hispanic Student Rates of Urban and Rural Districts

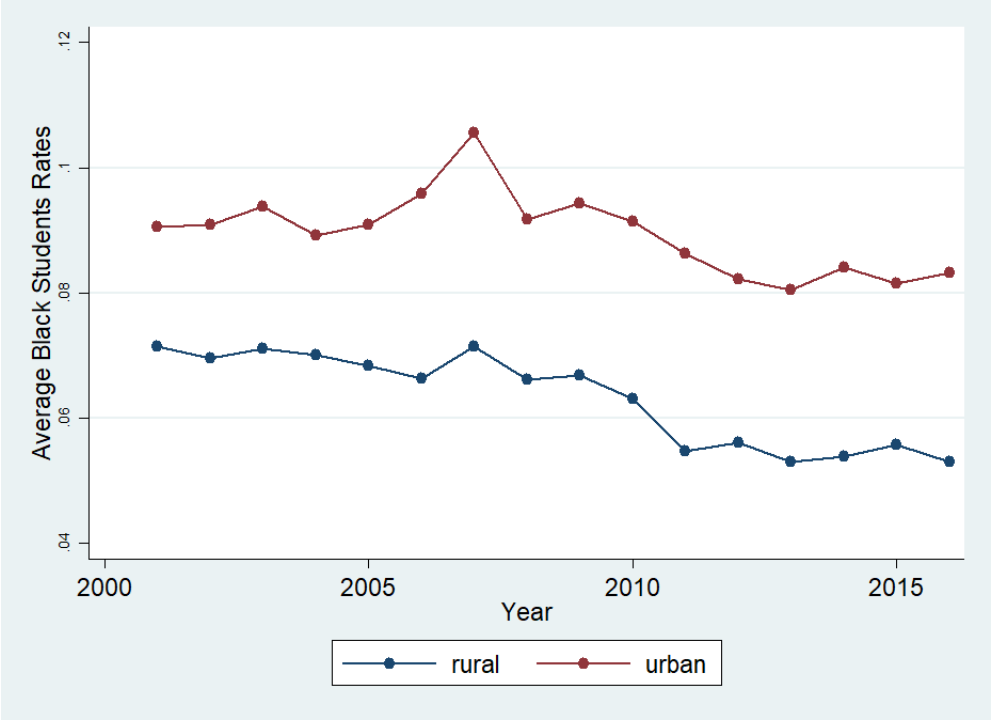

Figure 4.8: Black Student Rates of Urban and Rural Districts

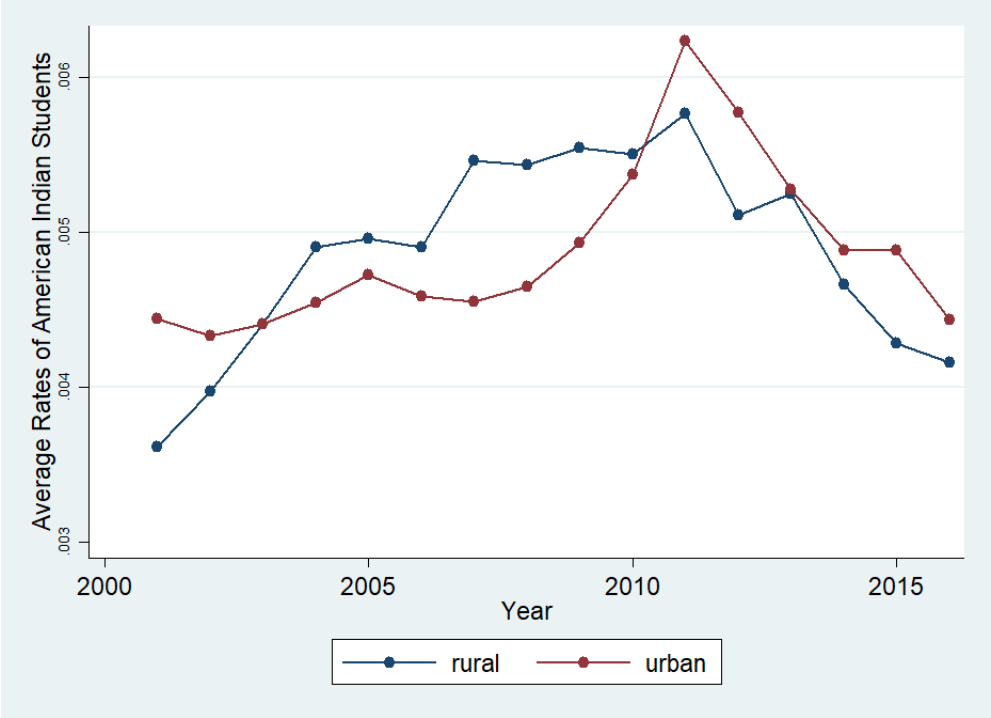

Figure 4.9: American Indian Student Rates of Urban and Rural Districts

districts may propose multiple bonds in the same year. In contrast, some districts only have one occurrence of a bond during the entire time-series. To account for this differentiation, the dependent variable was modified to reflect a percentage for failure and success of bonds during each year. Thus, the dependent variable is the likelihood of a success of the total percentage of bonds passed for each district during each year. Following the rationale of Bowers et al. (2010b), this modification to the dependent variable takes into account the notion of bond *floats* which occurs when bonds are brought back to voters after failure of passage. While the occurrence of floats were not identified in this data, the failure of different bonds was more likely after the initial passage of other bonds during the same year, or in previous years. In the dataset, 64 percent of school districts only had one bond election, 17 percent had two bond elections, and 10 percent had 3 bond elections. However, 36 percent of districts had a maximum number of 8 bonds elections. The majority of bonds pass on the first election occurrence, with 82 percent of the sample being passed by voter approval. However, among counties with multiple bond elections, the likelihood of passing a second bond decreases slightly. After the

first bond, the margin of success closes in each election– overall, 60 percent are successful and 40 percent fail to gain voter approval.

All models were run as fixed effects ordered logit models. Two iterations of the model are run. The first includes variables that are characteristics of the community; median income, change in poverty rate, and median age are included. I rely on median age for this analysis because it is common in the literature. However, future work will include shares of the populations that belong to age categories, which may provide more variation between counties. Furthermore, the required amount of the bond and the total number of students in the district are also included as control variables. Each model is run for the rural and urban counties of Texas. The second iteration of the model focuses on characteristics of the district including the debt principle, debt interest and minority rate of students. In addition, the date of the election and the purpose of the bond (1=building, 2=other, 3=programs, 4=refund, and 5=renovation) are also included. The following regression tables display parameter estimates and measures of fit including statistical significance and standard errors. All results are in odd ratio forms, which can be interpreted as coefficients greater than one are associated with higher odds of outcome (bond passage) and coefficients less than one are associated with lower odds of outcome (bond passage). If the coefficient equals one, this indicates that change the impact on the odds of an outcome.

First, all models are run with interactions to compare across place. Does a variable have a statistically different effect on the likelihood of passage comparing urban to rural districts? In each of these interactions, the baseline variable is urban. Coefficients can be interpreted as: compared to urban, what is the effect of each variable in rural districts? Then, I run each model using only the urban and rural sample. These models are not meant to compare coefficients, but to allow for some understanding of the magnitude of coefficients in each place-based model.

Age, income, and minority percentage of students are the key variables to test the hypotheses of this research. This is for two reasons. First, age and income are related directly back to the collective action paradox of passing an additional bond for public education. Following this logic, I also include current *minority rate of students* to test the argument that

communities with higher rates of diversity will reduce the likelihood of bond passage. The models presented in this paper are a simple empirical approach to analyze heterogeneity in preferences across place, aiming to provide some understanding as to why individuals support or oppose expanded public spending. These models seek to outline variation in preferences for spending on education by place. Overall, each of these variables included in the model relate to collective demand for education. The following table 4.3.1.2 outlines the regression findings for each model specification for each place-based group (urban and rural). Year fixed effects are included in each model to account for change in variables over time.

4.3.1.1 Time-Series Logit Regression Models

In the first specification of the model, I only include county level determinants and election information. Table 4.3.1.2 outlines these results. The full sample includes the interaction of place, comparing rural to urban. In this model, I find that increasing the total proposed amount for a bond has a positive, but null effect, on bond passage. The value of one indicates a very small effect. There is a significant difference in bond passage across rural and urban districts, however, this is again very small.

Across all districts, as county median income increases, the likelihood of bond passage also increases. As the county median income increases, the likelihood of passing a school bond increases by 2.69 times, holding all variables constant. However, this is not significant when interacted with place, indicating no difference among urban and rural districts. Among the rural sample, the effect of increased median income is considerable. As the county median income increases in the rural sample, the likelihood of passing a school bond increases by 9.35 times, holding all variables constant. This finding indicates that local economic improvement has a subsequent positive effect on school bond passage. Simply put, individuals in all districts are more likely to pass school bonds when the economy, earnings, and opportunity are improving. In this model, I do not find that increases in median age or increases in the poverty rate are statistically significant.

In the second model, I include the characteristics of minority students and the purpose of

the proposed bond. For the purpose variables, the baseline category is infrastructure (related to the school building). Table 4.3.1.3 outlines these results. In this model, the proposed bond amount is not statistically significant. Furthermore, this variable is also significant when interacted with the rural district variable. However, as in the first model, there is a significant effect for county median income. This coefficient indicates that as county median income increases, the likelihood of bond passage also increases. As county median income increases, the likelihood of passing a school bond increases by 2.73 times, holding all variables constant. However, there is no difference in the effect of this variable between rural and urban districts. Among the rural districts, increased median income is a major factor in increasing the likelihood of bond passage. As the county median income increases in rural counties, the likelihood of passing a school bond increases by 16.46 times, holding all variables constant. Again, median age and the county poverty rate are not significant factors in increasing the likelihood of bond passage.

Among the student composition variables, the only variable that is significant is the rate of Hispanic students. I find a substantial and positive effect on the likelihood of bond passage as the rate of Hispanic students in a district increases. As the rate of Hispanic students in a district increases, the likelihood of passing a school bond increases by 4.45 times, holding all variables constant. These effects appear constant over place. As the rate of Hispanic students in a rural district increases, the likelihood of passing a school bond increases by 4.74 times, holding all variables constant. As the rate of Hispanic students in an urban district increases, the likelihood of passing a school bond increases by 4.32 times, holding all variables constant.

Thus, the effect of increasing the rate of Hispanic students in a district is not an urban or rural phenomenon– but rather a state phenomenon. These findings echo the findings of Bowers and Lee (2013) which find that a higher proportion of Hispanic students increases the likelihood of passing a bond, all else being equal. Hispanic families are also likely to live in the community where their children are being schooled- this could lead to an increased support for school bonds that will benefit these students. In contrast, this finding could also indicate increased reliance on bond measures as the rate of Hispanic students in a school district increase. Figure 4.10 shows the marginal effects of this variable over time on the likelihood

of bond passage. Over time, the effect of this variable has remained positive. After the 2008 financial crisis, the following years saw an up-tick in the effect of this variable. In 2015, it had the lowest impact on increasing the probability of bond passage in the Texas sample. Furthermore, the effects of an increasing county median income have also remained positive throughout this time-series dataset. Figure 4.11 shows the marginal effects of county median income over time on the likelihood of bond passage

4.3.1.2 Logit Regression Results of Bond Elections with County Determinants

	Dependent Variable: Likelihood of Passing a School Bond					
	Full Sample		Rural Sample		Urban Sample	
Rural	0.01	(0.08)				
Proposed Bond Amount	1.00^{+}	(0.00)				
Rural $\times$ Proposed Bond Amount	1.00**	(0.00)				
County Median Income (Log)	2.69*	(1.21)	9.35*	(8.84)	2.04	(0.95)
Rural $\times$ County Median Income (Log)	1.60	(1.19)				
County Median Age	0.98	(0.03)	1.01	(0.03)	0.96	(0.03)
Rural $\times$ County Median Age	1.00	(0.04)				
County Poverty Rate	1.07	(0.42)	0.57	(0.51)	1.00	(0.39)
Rural $\times$ County Poverty Rate	0.60	(0.52)				
Border County	1.63	(0.50)	1.80	(0.93)	1.31	(0.54)
Election Date	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Debt Service Outstanding	1.00	(0.00)	1.00***	(0.00)	1.00*	(0.00)
N	2069		772		1297	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3.1.3 Logit Regression Results of Bond Elections with Student Characteristics

	Dependent Variable: Likelihood of Passing a School Bond					
	Full Sample		Rural Sample		Urban Sample	
Proposed Bond Amount	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Rural	0.05	(0.37)				
Rural × Proposed Bond Amount	1.00**	(0.00)				
County Median Income (Log)	2.73*	(1.26)	16.46**	(15.40)	2.09	(0.97)
Rural × County Median Income (Log)	1.36	(1.04)				
County Median Age	1.00	(0.03)	1.00	(0.03)	0.98	(0.03)
Rural × County Median Age	1.01	(0.04)				
County Poverty Rate	0.97	(0.38)	0.35	(0.30)	0.93	(0.37)
Rural × County Poverty Rate	0.60	(0.52)				
Border County	0.72	(0.26)	1.27	(0.73)	0.45	(0.23)
Election Date	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Debt Service Outstanding	1.00	(0.00)	1.00***	(0.00)	1.00	(0.00)
Rate of Hispanic Students	4.45**	(2.12)	4.74*	(3.18)	4.32**	(2.27)
Rural × Rate of Hispanic Students	0.78	(0.52)				
Rate of Black Students	0.39	(0.29)	1.33	(1.76)	0.33	(0.25)
Rural × Rate of Black Students	0.45	(0.63)				
Rate of American Indian Students	0.00	(0.01)	0.02	(0.11)	0.01	(0.20)
Total Number of Students	1.00	(0.00)	1.00***	(0.00)	1.00	(0.00)
Building	1.00	(.)	1.00	(.)	1.00	(.)
Other	0.63*	(0.11)	0.92	(0.32)	0.53**	(0.12)
Programs	0.52	(0.38)	1.57	(1.60)	0.29	(0.32)
Refund	1.40	(0.52)	0.80	(0.51)	2.02	(0.99)
Renovations	1.22	(0.31)	1.78	(0.84)	1.07	(0.33)
N	2065		770		1295	

Exponentiated coefficients; Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

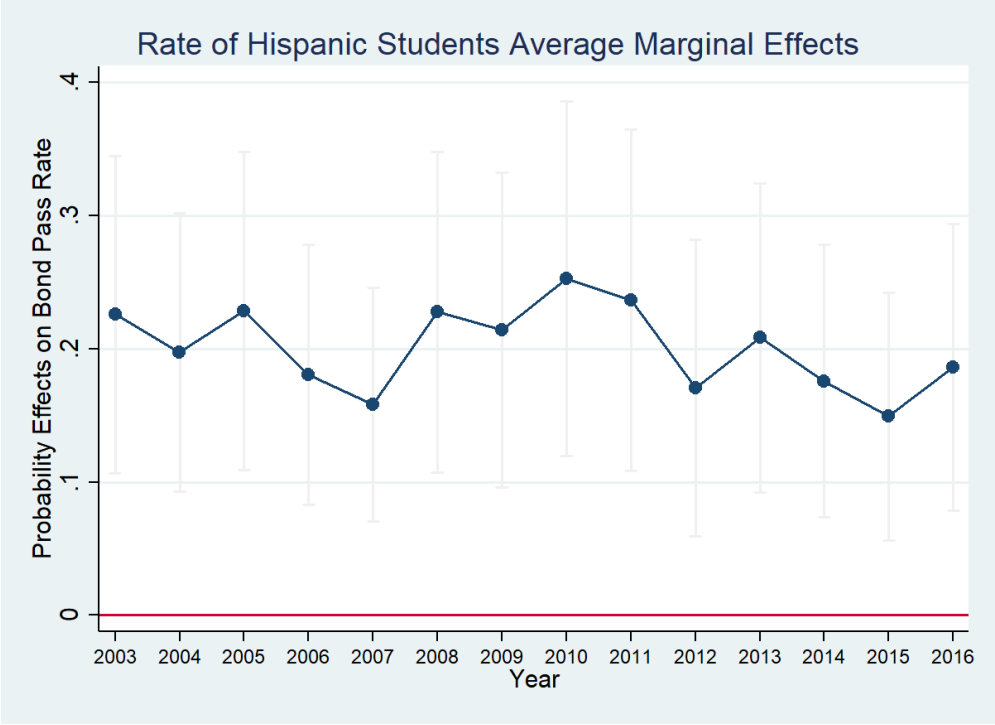

Figure 4.10: Marginal Effects of Rate of Hispanic Students (2003-2016)

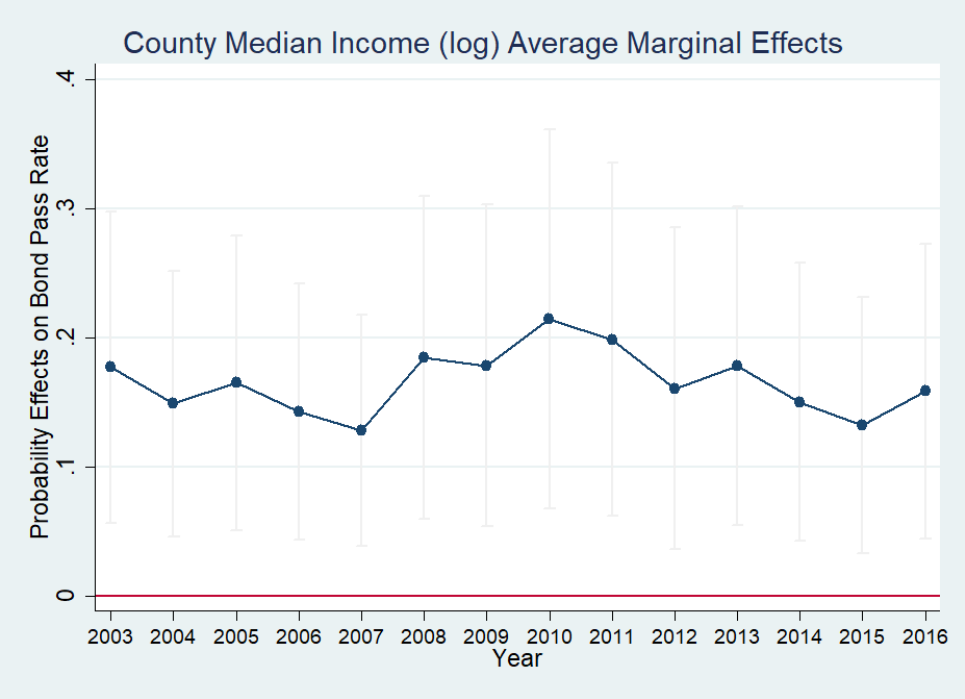

Figure 4.11: Marginal Effects of County Median Income (2003-2016)

4.3.2 Decomposition Method

In addition, I further employ a decomposition model based on the work of Oaxaca (1973) and Blinder (1973). This approach allows us to compare groups and ask, how much of the variation in spending preferences can be explained by observable individual differences of residents' urban and rural place? How much can be explained by the observable economic differences of each place? Finally, I use estimates to construct a counterfactual preference for spending on education, such as "what would be the average preference of a rural voter if they had the same characteristics as an urban voter?"

Decomposition models are typically used in labor economics to study wage differentials. There are limitations to this model, mainly that this model yields the mean gap in preferences across place and does not portray a full picture of differences between groups. However, this approach indicates the factors that are quantitatively important in group comparisons. Furthermore, this approach is useful to indicate potential explanations and hypotheses that might be explored in the future (Fortin et al., 2011). For this paper, the counter-factual is composed of comparing states of the world to simulate what the distribution of preferences for spending would look like if the individuals in one place had the characteristics of individuals in a different place. The Blinder-Oaxaca decomposition technique decomposes differences among two comparison groups, on average. A decomposition model asks the questions of how much the mean difference between the two groups, denoted by *E(Y)* or the expected value of the outcome variable is due to group differences in the predictors. This method permits the identification of factors between observable characteristics (endowment) and the return to those characteristics (coefficient). Adapted from Jann et al. (2008), the decomposition model consists of two groups, for urban and rural (U,R), with a three-fold output producing an endowment effect (*E*), coefficient effect (*C*), and the interaction effect (*I*).

$$R = E + C + I \tag{4.1}$$

$$E = (E(X_U) - E(X_R))'\beta_R$$

$$C = E(X_R)'(\beta_U - \beta_R)$$

$$I = E(X_U) - EX_R)'(\beta_U - \beta_R)$$

The first part of the decomposition analyzes the difference between the initial features of groups. The second part is linked to the productivity of factors between groups (Bonnal et al., 2013). A brief explanation of each output provides some context for understanding this method when comparing the two groups, urban and rural. The endowment effect will measure the expected change to the rural group mean outcome, if this group had the predictor levels of the urban group. In simpler terms, this means that we simply switch the predictor levels (value of each variable) between groups. The coefficient effect, in contrast, measures the expected difference in coefficients (the return on the dependent variable) on the mean outcome of the rural group, if the rural group had the coefficients of the urban group. If the endowment effect is most prevalent between models, it indicates that there are minimal differences between groups. In effect, we could keep the coefficients the same between models. However, if the coefficient effect is more pronounced, it indicates that the impact and contribution of the variables in the model are different between groups. The coefficient effect is referred to as a measure of labor market discrimination in labor economics. In the case of this paper, that would indicate that indeed, these places are systematically different. To put this in the context of popular culture, the commonly noted political polarization between urban and rural places is based on underlying and systematic differences between place. The estimated decomposition takes into account required bond amount, median income, median age, poverty rate, number of students, minority rate of students, and outstanding debt for each place sample. Oaxaca-Blinder decomposition offers us an understanding of the differences between groups. Using the results from the regression models, I can analyze the relative importance of the endowment and coefficient effects. Outlined are the mean decomposition results for each group. Standard errors allow for intra-group correlation among states, indicating that observations are independent across groups but not necessarily within groups.

Table 4.4 outlines the findings. In this sample, the mean of bond passage for public

Table 4.4: Results from Oaxaca-Blinder Decomposition Model

Results	*Urban/Rural*
Mean High	0.722
Mean Low	0.693
Difference	0.030
Endowment	0.316
Coefficient	-0.032
Interaction	-0.255

education is 0.722 for the urban group and 0.693 for the rural group, yielding a gap of 0.029. This is mainly due to the endowment effect, indicating that preference formation across place is more similar than different. The interpretation of the decomposition technique can be challenging to understand in the context of voter behavior. If we consider the example of gender wage differentials, the situation would be that increases in wages based on the same characteristics are due to labor market discrimination. In contrast, the endowment effect would be due to less schooling by women leading to lower wages. We can think of places in the same way. Voter behavior in rural areas is not due to some form of differential treatment, but rather due to differences in resources. I push the argument to consider voter behavior. It might be that rural areas, compared to urban areas, result in differential election outcomes because of some unobserved, systematic differences. For example, country people are just different from city people. However, finding that the endowment effect is dominant in the decomposition model tells a story of capacity differences. That is, it could be the voter outcomes are different because the fiscal and government capacity vary between places, resulting in variation in voter behavior and election outcome.

Furthermore, to test another variation of these findings, I decompose the group difference between metropolitan and non-metropolitan groups. These groups were constructed based on the method of definition employed by the United States Department of Agriculture and the United States Census Bureau. The model specification is the same as above, but the decomposition compares metro to non-metro. I find that the coefficient effect is dominant in this

decomposition. This means that there are underlying differences in the way that variables impact individual preferences between metropolitan and non-metropolitan places. While minimal, the findings of this paper warrant further investigation of spatial differences as a factor in preference for public intervention. It could be that relevant variables are left out of this decomposition model, however, it can be thought of as a baseline for policy analysis. Indeed, if the only difference between urban and rural places leading to differential election outcomes are governmental characteristics, change can happen. Rural and urban educational and governance capacity and characteristics can be equalized through public policy, creating more equitable schooling outcomes.

4.4 Conclusion

This study provides an analysis of local bond elections in Texas, with a focus on the urban and rural divide. Using data collected from over 2,000 bond elections in the state of Texas over the years 2000-2016, fixed effect logistic regression models are estimated to determine the factors associated with the likelihood of passing a school district bond by local district election. Among the hypothesis, I find that communities with higher median income are more likely to pass bond elections– a finding opposite to the proposed hypothesis. As the local economy improves, so does the odds of passing a school bond– with a substantial effect in the rural sample. However, there is no difference in the effect of this variable between rural and urban districts– meaning this is not a phenomenon to one place. In each of the models, there is no effect based on older cohorts (in rural areas) compared to younger cohorts (in urban areas). Increasing median age of a community is a significant determinant in passing (or denying) school bond passage.

Finally, I find support for the relationship asserted in the third hypothesis; communities with more diverse students populations (in particular, rising rates of Hispanic students) increases the likelihood of passing a school bond measure. I find a substantial and positive effect on the likelihood of bond passage as the rate of Hispanic students in a district increases. However, like median income, there is also no statistical difference when this variable interacts with

place. Thus, the effect of increasing the rate of Hispanic students in a district is not an urban or rural phenomenon. Regardless, this finding echoes past studies that have shown increased student diversity positively impacts bond passage likelihood (Rugh and Trounstine, 2011).

Each of these findings lend support to the notion that place-based characteristics matter in collective preferences for public goods, but does not dictate the likelihood of passing a school bond. Generally, the impact of variables in the urban and rural model behave in similar directions. Variation results from the magnitude of effects, where parameters are found to hold larger sway in more rural places, compared to urban counterparts. Using a decomposition model, I find the urban and rural places are not behaving differently based on different economic and social developments. Rather, the story is one of different inputs and outcomes. Voters in rural places are not behaving differently from urban voters based on some unobserved characteristic (such as ideology or personal traits). Resource differences are the underlying and fundamental differences. School bond elections are driven mainly by the differences in resources, capacity, and governmental ability– all the factors that drive education policy. In effect, the rural and urban divide is not a significant characterization to explain differences in preferences and voter behavior.

There are limitations to this study. First, politics at the local level are undoubtedly more varied than similar. The intention of this work is not to assert that all rural or urban communities are cut from the same cloth. Rather, this work aims to inform our understanding of the variation in voters across place and how that maps into collective outcomes. In fact, much of what we think we know about rural areas may be misguided. Consider the findings about race, which lend support to the idea that the probability of passing a bond election increases as students become less white.

There are two major implications from this research. The first is that the beneficiaries of public education matter. In both the urban and rural sample, an increase of Hispanic students is found to increase the likelihood of bond passage. Two potential explanations may be explored in future work. Hispanic families are likely to live in the community where their children are being schooled- potentially leading to increased support for school bonds that will benefit these

students. In contrast, this finding could also indicate increased reliance on bond measures as the rate of Hispanic students in a school district increase. In addition, the effect of Hispanic students is substantially large in the rural sample. Indeed, a higher proportion of Hispanic students has been found to increase the likelihood of passing a bond (Bowers and Lee, 2013). Future research should explore the underlying mechanisms for this relationship.

Second, place matters. The likelihood of bond passage reflects the community in which public goods are experienced. In particular, the economic health of the community. There is a significant and consistent effect for county median income in each model. As median income increases in Texas counties, the likelihood of bond passage increases by 2.73 times, holding all variables constant. However, there is no difference in the effect of this variable between rural and urban districts. Increased median income appears to increase bond passage likelihood across the entire state. Among the rural districts, increased median income is a major factor in increasing the likelihood of bond passage. As the county median income increases in rural counties, the likelihood of passing a school bond increases by 16.46 times, holding all variables constant. Again, median age and the county poverty rate are not significant factors in increasing the likelihood of bond passage. Again, the underlying factors that increase the likelihood of needing supplement bonds, such as decreasing school funds, could be analyzed in future research.

Optimistically, the findings in this paper are not one of fundamental and underlying differences between urban and rural people that lead to variation in political preferences. Rather, this story is one of differing capacity in terms of the local economy and student beneficiaries– which seemingly have a feedback loop into voter decisions surrounding more resources for local schools but do not differ across the Texan urban-rural divide.

CHAPTER 5

POLICY IMPLICATIONS

5.1 Policy Implications

The objective of this research was to bring forth insights about the collective decision-making in the complex rural environment; one in which, changing economic, social, and political dynamics converge to create challenges for the public financing of public goods. This project was an exploration of the relationship between preferences and spending in rural places, with urban and suburban communities as the default counterpoint. Reflecting the overall composition of the United States population, rural respondents are less in numbers compared to urban and suburban residents. A limitation of this study is the lack of data from rural residents. However, this study lends itself to the notion that place-based characteristics and local issues deserve place-based responses. Each of the pieces of analyses in this dissertation improve our understanding of the unique dynamics that motivate individual preferences and ultimately, impact the policy outcomes and design of government services for public goods, in this case public education.

The main policy domain, primary and secondary education, underscores the dynamics that surround school funding in rural communities compared to urban and suburban areas. Funding is the simplest measure of denoting differences in education. It is both nominal and easily comparable across districts and communities. The focus on this policy domain highlights variation in school funding across place and ask the core question: what are the key determinants in school funding preferences in rural areas and what factors drive education funding levels for rural schools, compared to urban and suburban counterparts? This particular policy domain focuses on the micro-level (income, etc.) and macro-level (migration) determinants

that impact rural communities and potentially impact attitudes towards education spending. An alternative route for this policy domain will be an analysis of current funding for schools in rural areas in relation to demographic, social, and economic factors.

In the first chapter, I analyze the determinants of tax preferences for public education, comparing individuals who live in urban (metro) areas with those who live in rural (non-metro) areas. This analysis seeks to fill gaps in empirical research about education in terms of the political economy of redistribution, in particular individual preferences for redistributive spending on education. I utilize two waves of nationally representative survey data to measure public preferences for education spending, analyzing differences in taxation preferences based on place. I find that there is a difference in the way that the middle-income group in non-metro areas prefers education taxes compared to their counterparts in metro areas; they prefer to decrease taxes for public education relative to metro middle-income individuals. Second, beliefs matter for preferences for education taxes. The belief that local schools are spending more than average reduces demand for education (with the preference to decrease taxes). In contrast, the belief that local schools are performing better than average increases the demand for education. However, the belief by non-metro individuals that there schools are performing on average increases their preference for more education taxes, relative to their metro counterparts. Third, individuals across the United States prefer to increase taxes for local public education when they believe that unequal resources and inadequate funding are problematic. On the contrary, the belief that the federal government is a problem in public education is associated with a preference to decrease taxes. However, there is no statistical difference in these beliefs across the place-based categories. Finally, I find that living in a rural area over time intensifies individual preferences to increase taxes for public education more than those living in an urban area. When the samples are pooled, we find a more complex picture of preference formation. Indeed, place-based preferences are shifting in different ways. However, the ways in which preferences shift indicate that rural respondents, more so than urban respondents, are more likely prefer increasing taxes for public education. These findings indicate that the differences estimated in these models, based on the place categories, do not aptly define political divides

in school funding debates. Rather, factors such as cross-jurisdictional perceptions are stronger determinants in individual tax preferences.

In the second chapter, I analyze the local calculation that drives individual preferences for increasing state spending on public education. The logic behind this argument is that individuals are willing to increase spending on local education when local employment opportunities or returns on investments, are higher. This approach is based on a complementarity relationship between public goods and collective outcomes. Using individual level survey data, school district funding averages, and county level economic variables, I perform a series of ordered logit models that find, across all places, as the unemployment rate increases, demand for education declines. Furthermore, when unemployment interacts with places, I find that there is no statistical difference between place (urban, suburban, and rural) in the causal mechanism of unemployment as a factor in spending preferences. To consider another measure of public preferences towards education, I run the same models with a dependent variable that measures how individuals "grade" their local schools– a proxy measure of perceived school quality and value. As was the case of spending on public schools, increasing that *rurality* of a place reduces the individual value placed on local, public schools. These findings suggest that individuals value education differently due to their ability to turn educational attainment into economic prosperity, a reflection of complementary considerations. However, while preferences between urban, suburban, and rural individuals may vary based on a variety of factors, the current categories of place do not fully capture preference variation between individuals. Rather, the findings from this study illustrate more commonalities between individuals. These findings contrast the narrative that political ideology largely determines preferences on public good investments. Rising county-level unemployment and median household incomes both affect the likelihood of an individuals preferring to increase state spending on public schools.

In the third chapter of this dissertation, I analyze local bond elections in Texas, with a focus on the urban and rural divide. Focusing on place aims to measure occurrence of preference variation, where individuals do not always collectively demand more from government to fund their public schools. First, using data collected on over 2,000 bond elections in the

state of Texas over the years 2000-2016, time-series logistic regression models are estimated to determine the factors associated with the likelihood of passing a school district bond by a local district election. I find that increasing the median income of a county positively improves the likelihood of bond passage. However, there is no difference in the effect of this variable between rural and urban districts. Simply put, the effect is not a place-based phenomenon. I also analyze the student body composition as a determinant affecting the likelihood of bond passage. I find a substantial and positive effect on the likelihood of bond passage as the rate of Hispanic students in a district increases. However, like median income, there is also no statistical difference when this variable interacts with place. Thus, the effect of increasing the rate of Hispanic students in a district is not an urban or rural phenomenon. Each of these findings lend support to the notion that place-based characteristics matter in collective preferences for public goods, but it does not dictate the likelihood of passing a school bond. Voters in rural places are not behaving differently from urban voters based on some unobserved characteristic (such as ideology or personal traits). To analyze this further, I employ the Oaxaca-Blinder decomposition model to consider how collective preferences may be shaped differently across place. Again, I find that rural and urban divide is not a significant characterization to explain differences in preferences and voter behavior. Optimistically, this story is not one of fundamental and underlying differences between urban and rural people, but rather one of differing capacity in terms of the local economy and student beneficiaries.

5.1.1 Policy Recommendations

5.1.1.1 Defining Place

Each of these studies reveal variation in funding public schools. However, the findings of each paper reveal that place-based differences are not fully explained by the urban-rural divide. While these places may theoretically build a unique preference set for individuals in their estimations of schools spending levels, these studies empirically highlight the complexities in how place shapes preferences. This could be due to a limitation with the definition of place used in these studies. For example, these studies rely on the United States Department

of Agriculture Rural-Urban Continuum Codes. These codes create a classification of place that distinguishes the difference between metropolitan and non-metropolitan counties. In this classification format, metropolitan counties are defined by the population size of the metro area. In contrast, non-metropolitan counties are defined by the degree of urbanization and adjacency to a metro area. The limitation of this classification scheme is that it over-simplifies place. I suspect that the main issue in the confounding findings is the definition of place as urban, suburban, and rural. Simply put, these definitions are too simple for the complex economic, social, and political changes across geography.

The key policy recommendation is to create an index of place, rather than relying on definitions such as metropolitan/non-metropolitan and urban/suburban/rural. This index should rely on a variety of variables to analyze the relationship between place and preferences. For example, variables such as levels of economic development, demographic change, broadband access, social capital indicators, and distance from amenities would improve our understanding of place. These variables, combined as a developmental index, may provide greater insight into the underlying factors that drive place-based preferences for spending. Two existing datasets provide insight into the local mechanisms impacting preferences for taxes, spending, and bond election outcomes. The USDA County Typology Codes classify all U.S. counties according to six mutually exclusive categories of economic dependence and six overlapping categories of policy-relevant themes (United States Department of Agriculture, 2015). These codes are based on county-level estimates of earnings and employment from the Bureau of Economic Analysis' (BEA) Regional Local Area Personal Income & Employment data, Decennial Census data, and 5-year American Community Survey (ACS). The Distressed Communities Index (DCI) combines economic indicators into a comparative measure of community well-being and relies on 5-year American Community Survey (ACS) and Business Patterns datasets (Economic Innovation Group, 2018). In addition to these existing codes, I contribute additional variables that may be fundamental for better explaining the underlying local effects on community outcomes. Table 5.1 outlines these measurements.

The main implication of this recommendation is to include variables that better examine

Table 5.1: Indexing Place and Local Effects

USDA County Types 2015	Distressed Communities Index 2018	Suggested Variables
Low Education	No High School Diploma	Changes in Funding Formulas
Low Employment	Adults Not Working	Percent of Low-Wage Jobs
Persistent Poverty	Poverty Rate	Degrees of Economic Instability
Persistent Child Poverty	Median Income Ratio	Tax Rates/Limitations
Population Loss	Changes In Employment	Demographic Changes
Retirement Destination	Changes In Business Establishments	Need for Public Services
Economic Typology	Housing Vacancy Rate	Distance to Amenities

the local factors influencing the rationale of individuals. To do this, we must better understand the local processes in which they are residing. These experiences may be comparable or contrast across the urban-rural divide. That is, a small town may more closely resemble a post-industrial place in its economic experience. Underlying places are political economy mechanisms including changing demographics, such as increasing rates of older individuals, and socioeconomic issues, increasing poverty levels and widening inequality. To fully outline the geographical variation in economic change, place-based definitions should originate from a variety of effects as well as degrees of severity. This would allow for a better understanding of the effect of place, as well as effectively prescribe policy-solutions and drive decision-making.

5.1.1.2 Recognizing Place

The overarching policy implication is that place captures local experiences. These local experiences set the baseline for how individuals demand more or less from their public institutions. Underlying these preferences is clearly ideology, however, this does not fully explain individual preferences. Rather, individual preferences are complex and based on the shifting social, economic, and demographic changes experienced by the individual. Thus, place matters in explaining public demand, preferences, and divergence between collective need and citizens' attitudes. Compared to urban and suburban communities, rural communities face geographic isolation, population decline, and a hollowing out of employment and industry. These trends across place present a challenging environment for funding public goods and the goal of this research is to inform our understanding of the dynamics that shape preferences for

public spending across geography. Overall, I find that the urban-rural divide is not a significant characterization to explain differences in preferences and voter behavior. The findings in this dissertation show that preference variation is mainly related to local economic conditions, educational attainment, investment comparisons across jurisdictions, and differences in local beneficiaries- factors which may transcend the categories of urban, suburban, and rural. Rather, the findings from this study illustrate more commonalities between individuals. Rural Americans, contrary to current belief, do not appear different in their preferences and values for public goods, in particular, public education. If the only difference between urban and rural places leading to differential outcomes are local economic characteristics, change can happen. In fact, rural, suburban, and urban educational outcomes can be equalized through public policy, creating more equitable schooling outcomes– regardless of local place-based differences.

APPENDIX A

A SIMPLE MODEL OF EDUCATION SUPPLY AND DEMAND

The key elements to this model are wages, taxes, and income. Some individuals have more wealth than others initially, and it is assumed that individuals with more wealth effectively permit the expansion of education. In this model, individuals are grouped by income (high, middle, and low). Individuals who receive education will fall into two main segments of the labor markets, skilled or unskilled, an outcome operationalized as a function of wage. For the sake of this model, individuals are either fully skilled or unskilled (Ansell, 2010).

Skilled and unskilled labor, w_s and w_u, are directly related to relative productivity and relative abundance. In other words, the economy of this model is segmented, and the value of labor is directly related to the overall output of that labor and the premium placed on each type of labor. It is assumed that the overall productivity of skilled labor, σ_s, is always higher than the productivity of unskilled labor, σ_u. Skilled labor expansion,that is, more individuals doing skilled labor, is thought to drive down the premium on this segment of the labor market. For example, more skilled labor drives down the economic value, or the overall financial benefit, of this labor segment. Based on this, there is an incentive to reduce the expansion of skilled labor to ensure a high financial benefit to those already within this segment of the labor market. This can be thought of in terms of maintaining a status quo distribution of power in the labor market. In this model, labor supply elasticity is expressed by *a* (unskilled labor supply parameter) and *b* (skilled labor supply parameter). These parameters reflect the degrees to which scarcity affects wages– relative abundance of skilled labor would in turn imply a relative scarcity of unskilled labor (Ansell, 2010). This is due to the notion that the expansion of education would move individuals from the unskilled segment of the labor market to the skilled segment, driving down the premium on the skilled labor group. Naturally, this is directly related to the proportion of the population who are skilled, $S \in [0, 1]$. Accounting for these parameters, the author builds the initial labor market equilibrium for skilled and unskilled wages, as factors of relative

abundance and productivity.

$$w_s = \sigma_s - bS \tag{1}$$

$$w_u = \sigma_u + aS \tag{2}$$

Wages for skilled or unskilled work will increase or decrease based on the productivity of each labor segment in addition to the labor premium which is reflected by the proportion of workers currently in each segment. This means that wages will change based on the productivity of a labor segment, as well as how many other workers are doing this type of work. Skilled wages will decrease with the relative abundance of skilled laborers, yet increase with productivity. The same is true for the wages of unskilled labor. This model assumes that individuals who receive skilled wages (related to education) already have higher wealth than those who receive unskilled wages. This means that expansion of education begins with the wealthiest members of society extending to the poorest. In this case, everyone has a *inverse skill index*, $S \in [0, 1]$, where $s_i = 0$ (receives education first) and $s_i = 1$(receives last). The following wealth q_i parameter lays out this relationship.

$$s_i = f(q_i), f`(q_i) < 0; f(min(q_i) = 1; f(max(q_i = 0) \tag{3}$$

According to this model, the inverse skill index is directly related to the proportion of the population that are skilled, *S*. Earning skilled wages will increase from the richest to the poorest as S increases. This indicates that individuals will be earning skilled wages w_s or unskilled wages w_u. The following equations lay out this relationship.

$$s_i \leq S \Leftrightarrow w_j = w_s \tag{4}$$

$$s_i > S \Leftrightarrow w_j = w_u \tag{5}$$

Using these equations, Ansell (2010) constructs the following income equations:

$$y_i = q_i + w_j(s_i(q_1), S) \tag{6}$$

$$y_i = q_i + \sigma_s - bS(s_i \leq S) \tag{7}$$

$$y_i = q_i + \sigma_u + aS(s_i > S) \tag{8}$$

In these income equations, the variable representing wages (w_j) is substituted for the relevant equations that reflect productivity and scarcity of a labor group. In equation 7, the variable *b* represents the scarcity of skilled labor and as more individuals enter this field, there is a larger net negative for skilled laborers. For these high-income and skilled labor groups, wages will be reduced as this field becomes more populated, creating an incentive for them (the wealthy and educated) to restrict the expansion of education. For laborers who make the jump into skilled labor from unskilled labor, they will experience a boost in wages. In contrast, the variable a in equation 8 reflects the scarcity effect of unskilled labor. As long as this variable does not decrease too dramatically (for example, below zero), there are benefits from the unskilled labor group as unskilled labor becomes more scarce. This drives up the premium for this group. In effect, the only group that does not benefit from expansion in education are those already educated and in skilled labor. What we find is that education serves as a positive benefit for those who receive education first (low-income) and a net negative for those already educated (high-income). The receipt of education generates an increase in wages for those who receive it for the first time and move into skilled labor.

Now, we consider the role of taxation as a factor in the endogenous preferences of individuals to expand education. To expand education, citizens must agree to taxation of their income. This results in a total cost for education (*cS*). In the original model, it is assumed that this taxation is through a flat tax on income (Ansell, 2010). In reality, this is a simplification that deserves more attention to understand heterogeneity in preferences. However, I will lay out this model parameter and then outline my extension on this point. The population of a country is one in this taxation parameter, allowing us to denote the flat tax (*T*) as a tax rate (*t*) applied to average income $\overline{y}$). This generates the following equation: $T = t\overline{y} = cS$. This model is two-generational, in which parents determine their preferences for taxation in the zero

period (0) and children are educated in the first period (1).

$$t\overline{y} = cS \Leftrightarrow t = \frac{cS_1}{\overline{y}_0} \tag{9}$$

Based on the following equation, we can determine the utility of families in their estimation of the value of education. Utility is comprised of income in the zero period, net of taxes, and (future) income of period one. It is assumed that families are deciding to discount (denoted by δ) between period zero and period one, or trying to determine the outcome of future income (based on either unskilled w_u or skilled w_s labor activity) that is most likely for their children during period one as a factor of their preference for taxation during period zero. In addition to the expected return on education due to which segment of labor market their children will fall, there are levels of externalities generated by education ((denoted by$g$). Ansell assumes that education only produces positive externalities, whereby all citizens benefit from the education of one citizen. An analysis of externalities are further explained in the extension of this model. In the following utility function, we see that utility is a function of taxation of income in the zero period alongside expected income and externalities in the first period. In addition, Ansell (2010) takes the derivative of the utility function with respect to the level of public education provision (S_1). We find that parental income, weighted by relative income, in the zero period is negative indicating that the greater the income, the more share of tax burden. Second, we find that perceived utility of education is driven by the expected income and positive externalities in period one.

$$U_i = [1 - \frac{cS_1}{\overline{y}_0}]y_{i0} + \delta[q_{i1} + w_{j1}(S_1) + g(S_1)] \tag{10}$$

$$\frac{\partial U_i}{\partial S_1} = -c\frac{yi0}{\overline{y}_0} + \delta\frac{\partial w_{j1}(S_1)}{\partial S_1} + g \tag{11}$$

In the original model, it is argued that externalities remain purely positive. The impact of the provision of education on income in period one is a function of which income group an individual initially falls into (in period zero). Thus, the model further distinguishes between the three main income groups (high, middle, and low). Consider the impact of education provision

on high-income earners. We find that the effect is largely a net negative for this group. This is highlighted in equation 12. Expanding education for this group results in high taxes and negative impact. This is mainly due to the decreasing premium on skilled labor, resulting from an increasing proportion of the population that now falls into this labor segment.

$$\frac{\partial U_H}{\partial S_1} = -c\frac{q_H + w_{s0}}{\overline{y}_0} + \delta[-b + g] \tag{12}$$

In contrast, we find that middle-income families largely benefit from the expansion of education. This is highlighted in equation 13. As this group moves from unskilled to skilled labor, we find that they experience an increase in income. While the cost of education, relative to unskilled wages remains relatively low, the benefit from education expansion (potentially moving this group into skilled labor) in period one is a net benefit.

$$\frac{\partial U_M}{\partial S_1} = -c\frac{q_M + w_{u0}}{\overline{y}_0} + \delta[[\sigma_s - bS_1] - [\sigma_u + aS_1] + g] \tag{13}$$

Finally, we find that the low-income additionally benefit from increased spending on education, regardless of their lack of movement out of the unskilled labor. This is highlighted in equation 14. Ansell argues that even if this group does not receive education, they benefit from the positive externalities collectively generated through better local schools.

$$\frac{\partial U_L}{\partial S_1} = -c\frac{q_L + w_{u0}}{\overline{y}_0} + \delta[a + g] \tag{14}$$

This model provides us with a starting point for considering variation in preferences for education. Based on these findings, we should find the middle-class to be the persistent champions of expanding education. Arguably, it would be irrational to have a group that benefits to demand *less* expansion of government in the provision of public education. The following section analyzes a few modifications to this model that provide insights into shifting preferences for education as well as geographic variation.

APPENDIX B

2015 SURVEY QUESTIONS

HUF15_309 *If R HAS CHILDREN- Where are your children currently in school (choose more than one, if children are enrolled in various schools)?*

1. Public school
2. Private school
3. Magnet school
4. Charter school
5. Special education schools
6. Virtual Schools
7. Religious Private Schools
8. Home school
9. Not In School

HUF15_310 *Do you think public schools in your district spend more per pupil or less per pupil than other school districts in your state?*

1. A Lot More
2. More
3. About Average
4. Less
5. A Lot Less

HUF15_311 *Compared to other schools in your state, do you think your local public schools are better than average or worse than average*

1. A Lot More
2. More
3. About Average
4. Less
5. A Lot Less

HUF15_312A (Split Sample) *Suppose your local school district cut spending on public schools by 10 percent. Would the schools in your area get Better or Worse or have No Change in each of the following ways?*

1. School safety
2. Quality of instruction
3. Class sizes
4. Test scores
5. Extra-Curricular Activities
6. Diversity of students
7. Overall

HUF15_313A (Split Sample) *If your state government cut funds for public education by 10 percent, how do you think the following sorts of people would be affected?*

1. Low Income People
2. Middle Income People

3. High Income People
4. Homeowners
5. Whites
6. Immigrants
7. Hispanics
8. Blacks
9. Teachers
10. Students
11. Tax Payers
12. People like you

HUF15_312B (Split Sample) *Suppose your local school district increased spending on public schools by 10 percent. Would the schools in your area get Better or Worse or have No Change in each of the following ways?*

1. School safety
2. Quality of instruction
3. Class sizes
4. Test scores
5. Extra-Curricular Activities
6. Diversity of students
7. Overall

HUF15_313B (Split Sample) *If your state government increased funds for public education by 10 percent, how do you think the following sorts of people would be affected?*

1. Low Income People
2. Middle Income People
3. High Income People
4. Homeowners
5. Whites
6. Immigrants
7. Hispanics
8. Blacks
9. Teachers
10. Students
11. Tax Payers
12. People like you

HUF15_314 *Would you vote to increase taxes for public school funding, decrease taxes for public school funding, or keep taxes for public school funding the same?*

1. Increase taxes for public schools
2. Decrease taxes for public schools
3. Keep the same

APPENDIX C

2016 SURVEY QUESTIONS

HUZ420 *Which applies to you? [Check all that apply]*

1. I do not have children
2. I have children in public schools
3. I have children in private schools
4. I have children who are not yet school age
5. I have grown children who went to public school
6. I have grown children who went to private school

HUZ421- Education Problems *What do you consider to be the problems facing public education?*

1. Teachers Unions
2. Not enough Funding
3. Parents
4. Popular Culture
5. Federal Government Intervention
6. Lack of Local Control
7. Lack of Standards
8. Too much testing
9. Bad Teachers

10. Bad Administrators
11. Unequal resources among schools
12. Immigrants
13. Charter Schools

HUZ423 *Do you think that a 20 percent increase in spending on schools in the US as a whole would make public schools better or worse?*

1. A Lot Better
2. Better
3. No Impact
4. Worse
5. A Lot Worse

HUZ424 *Do you think that a 20 percent cut in spending on schools in the US as a whole would make public schools better or worse?*

1. A Lot Better
2. Better
3. No Impact
4. Worse
5. A Lot Worse

HUZ425 *If spending on public schools were increased by 20 percent, how do you think the following sorts of people would be affected? [Benefit A Lot-Benefit Some-Harm A Lot- No Impact]*

1. You
2. Tax Payers
3. People like you
4. The US as a whole
5. Low Income People
6. Middle Income People
7. High Income People
8. Homeowners
9. Whites
10. Immigrants
11. Hispanics
12. Blacks
13. Teachers
14. Students

HUZ425 *If spending on public schools were CUT by 20 percent, how do you think the following sorts of people would be affected? [Benefit A Lot-Benefit Some-Harm A Lot- No Impact]*

1. You
2. Tax Payers
3. People like you
4. The US as a whole

5. Low Income People
6. Middle Income People
7. High Income People
8. Homeowners
9. Whites
10. Immigrants
11. Hispanics
12. Blacks
13. Teachers
14. Students

HUZ427 *If spending on public education increased by 20 percent, would the public schools get Better or Worse or have No Change in each of the following ways?*

1. School safety
2. Quality of instruction
3. Class sizes
4. Test scores
5. Extra-Curricular Activities
6. Diversity of students
7. Overall

HUZ429- Grade US Schools *What grade would you give to public schools in the United States overall? A is excellent and F is Failing.*

1. A
2. B
3. C
4. D
5. F

HUZ430 *Would you vote to increase taxes in order to increase spending on public schools?*

1. Increase taxes for public schools
2. Decrease taxes for public schools
3. Keep the same

HUZ431 *Based on your current understanding, which level of government pays the most for public schools in your area?*

1. Federal
2. State
3. Local

HUZ432 *In your opinion, which level of government should be most responsible for providing education? And which level of government should be least responsible? Please rank order (1 primary responsibility, 3 least responsible). If you think a level of government should have NO responsibility use the number 0.*

1. Federal
2. State
3. Local

HUZ433 *Federal, state, and local governments spend money on public schools. For each level of government, indicate whether you think that spending should increase or decrease or stay the same.*

1. Federal
2. State
3. Local

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