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INCOME INEQUALITY AND ECONOMIC GROWTH

IN UNITED STATES COUNTIES: 1990S, 2000S, AND 2010S

KYLE D. FEE[1]

ABSTRACT

Using a common reduced-form regional growth model framework, an expanded geographic classification of counties, additional years of data, a trio of income inequality metrics, and multiple empirical specifications, this analysis confirms and builds upon the notion that the nature of the relationship between income inequality and economic growth varies across geography (Fallah and Partridge, 2007). A positive relationship between an income Gini coefficient and per capita income growth is observed only in central metro counties with population densities greater than 915 people per square mile or in about 5 percent of all counties, whereas previous research found a positive relationship in all metropolitan counties (27 percent of counties) and a negative relationship in nonmetropolitan counties. Where inequality is in the distribution is also shown to impact this relationship. Inequality in the top and bottom halves of the income distribution has a positive relationship with growth within this 5 percent of counties. However, in most locations (the other 95 percent of the counties), inequality in the bottom half of the income distribution has either no statistical relationship with growth or a positive relationship, while inequality in the top half of the income distribution tends to have a negative relationship. These patterns are relatively stable over time but tend to not be robust to the inclusion of county fixed effects. These results provide some evidence that the mechanisms explaining how this relationship varies across places are more likely associated with agglomeration and market incentives rather than social cohesion. This analysis also highlights the need for a robust research agenda focused on further refining the growth model along with incorporating new data sources and concepts of income inequality.

Keywords: Income Inequality, Regional Growth, Income Gini Coefficient

JEL Classification: R11, O40, O18, D31

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Increasing income inequality in the United States naturally raises questions related to its potential impacts on economic growth. Conflicting theories and a looseness of concepts muddle the nature of the relationship between income inequality and economic growth. Furthermore, data comparability and availability problems at the national level have led researchers to focus on subnational analyses to uncover the nature of the relationship. However, even with improved data quality, mixed empirical results continue due to methodological differences. A positive relationship has been observed at the state level (Partridge, 1997; Partridge, 2005; Frank, 2009), at the commuting zone level (Bradbury and Triest, 2016), and at the metropolitan statistical area level (Dev Bhatta, 2001), whereas Panizza (2002) finds mixed evidence at the state level. Cross-sectional approaches tend to find a positive relationship between inequality and growth, while fixed-effects specifications tend to indicate the lack of a statistical relationship between the two (Partridge, 1997; Dev Bhatta, 2001; Panizza, 2002; Partridge, 2005).

One additional explanation for the continuation of mixed findings in subnational analyses is that the relationship between income inequality and growth varies by location. Studying the 1990s, Fallah and Partridge (2007) found that higher levels of income inequality were associated with higher growth rates in metropolitan counties, while higher levels of income inequality were associated with lower growth rates in nonmetropolitan counties. The authors theorized the existence of a curve along which the inequality-growth relationship varies according to the degree of agglomeration-social anonymity (ASA), but they caution that this pattern may be unique to the 1990s as technological advancements fueled strong growth during this period. They suggest further research to explore the stability of this pattern over time.

Following this directive, this analysis aims to clarify and better understand how the income inequality and growth relationship varies across locations. Fortunately, the well-

developed inequality and growth literature has a rich foundation, such that my goals are not to search for causality, but rather to apply the analytical tools developed in the literature to a uniform set of relevant and available data on US counties. Empirically evaluating the income inequality and economic growth relationship in this comprehensive manner aims to inform our understanding of the data as well as to inform theory. A broader geographic classification of counties is used to explore and describe how the relationship varies across place, especially within metropolitan counties. Additional years of data are used to examine whether these patterns are stable over time and across estimation methods. This analysis also considers different ways in which income inequality is conceptualized by including the traditional measure— an income Gini coefficient — as well as metrics to separately capture inequality in the top and bottom halves of the income distribution.

A broader geographic classification of US counties and additional years of observations confirm and build upon the notion that the relationship between income inequality and growth varies across geography (Fallah and Partridge, 2007). Expanding the geographic classification of counties from a binary metropolitan and nonmetropolitan county framework to a broader one confirms that the inequality and growth relationship varies across place. A negative relationship exists in rural, micropolitan, and outlying metropolitan counties, but also in all but the densest central metropolitan counties. A positive relationship is observed only in central metropolitan counties with population densities greater than 915 people per square mile or the top 20 percent of central metropolitan counties in terms of population density in 2010 or about 5 percent of the overall sample. Additional years of observation show that this pattern is largely stable from the 1990s to the 2010s. And despite some movement in the magnitudes of the coefficients over the decades, they are generally statistically similar over time. This overall pattern across counties

does not hold up to the inclusion of county fixed effects, as evidence of a positive relationship is no longer observed. However, a negative relationship continues to be observed in rural, micropolitan, and outlying metropolitan counties.

Moving away from a traditional income Gini coefficient to a pair of inequality measures designed to separately capture inequality in the top and bottom halves of the income distribution reveals some interesting nuances for understanding how the inequality and growth relationship varies across geography. In rural, micropolitan, and outlying central metropolitan counties, inequality in the bottom half of the income distribution has no statistical relationship with growth, while inequality in the top half of the income distribution exhibits a negative relationship. Within central metropolitan counties, low-end inequality has a positive relationship with growth and high-end inequality has a negative relationship, except for the most population-dense central metropolitan counties, which show a positive relationship for both income inequality measures. These patterns are largely stable over time, but there is some evidence that the positive relationship between inequality in the top half of the income distribution and growth is waning. And while some portions of these patterns are robust to the inclusion of county-level fixed effects, evidence of a positive relationship between income inequality and growth is not. These results highlight how the understanding of the relationship can vary depending upon the concept of income inequality.

Collectively, the findings continue to highlight that the location, the concept of income inequality, and the methods used are important factors in explaining the nature of the relationship between income inequality and economic growth. In terms of theory, this analysis is supportive of the view that income inequality promotes growth by providing the market incentives to support the specialization of labor for innovation and entrepreneurship. Relatedly, this analysis

indicates that the ASA curve is further to the right on the agglomeration-social anonymity scale than originally thought, implying that the mechanisms for linking income inequality to growth are more likely associated with agglomeration than with social cohesion. On the other hand, the negative relationship observed in this analysis supports the view that slower growth could be rooted in an inability to access credit markets outside of dense central metropolitan counties. These patterns are subject to change, since this analysis also highlights numerous opportunities for future research on the topic.

Conflicting Theories

The contemporary literature on inequality and economic growth can be traced to the 1950s when Simon Kuznets asked the question: "Does inequality in the distribution of income increase or decrease in the course of a country's economic growth?" (Kuznets, 1985) While his initial work in the field sought to link stages of a country's economic development (pre-industrial, industrial, post-industrial) to changes in the distribution of income within that country, the literature has deviated from this original intent to explore the nature of the relationship between inequality and growth. While this relationship likely flows in both directions, a majority of the work on the topic has focused on how the initial level of inequality impacts subsequent growth rates; I also focus on this directionality of the relationship. Several different theories on the relationship between the initial level of inequality and growth have been posited, yet they are at odds with each other.

There are three main theories in the contemporary economics literature suggesting a negative relationship between inequality and economic growth. The political economy argument suggests that in unequal societies, voters support the redistribution of resources through the taxing of investment and other growth-promoting activities, which distorts economic activity and

slows growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994). Next, the imperfect capital markets argument says that in unequal societies, the inability to access credit markets prevents certain populations from investing in physical (housing) and human capital, and this lack of access limit growth (Banerjee and Newman 1991; Aghion and Bolton 1992). Lastly, the social conflict argument indicates that in unequal societies, there is less investment and a lack of strong property rights, which slows growth (Alesina and Perotti, 1994). The first two theories are likely more relevant to an analysis of US counties, as strong property rights are the hallmark of the United States legal system.

Alternatively, there are theories suggesting a positive relationship between inequality and economic growth. The savings argument contends that in unequal societies, the savings rate is higher, which translates into higher rates of investment and more economic growth (Kaldor, 1955; Barro, 2000). While the savings argument is plausible in the context of US counties, local savings do not always translate into local investment, as capital markets operate on a national or international scale. The incentive argument suggests that inequality provides market incentives to support the specialization of labor for innovation and entrepreneurship by rewarding risk-taking (Siebert, 1998; Edin and Topel, 1997). The incentive argument is likely the most applicable to this analysis as it is based on labor markets, which tend to be regional in nature, while aligning with the perspective that innovation and entrepreneurship are important determinants of economic growth.

An additional theory attempts to reconcile the notion that inequality can have a negative and positive relationship with growth depending upon the location. Fallah and Partridge (2007) contend that "the transmission mechanism through which inequality/economic incentives influence economic growth can be affected by factors such as urbanization and social cohesion"

(p. 375). More simply, place matters when it comes to the nature of the relationship between inequality and growth. They argue that in urban areas (or agglomeration economies) inequality benefits growth because a wider distribution of income, especially at the top end, helps to attract and retain a specialized labor force that promotes growth. However, in rural communities, growth relies more on social capital and cohesion, and a general lack of anonymity means that inequality is believed to be more personal, such that inequality reduces social connections and growth. This theory also suggests the existence of a curve along which the inequality-growth relationship varies according to the degree of agglomeration-social anonymity, suggesting that inequality is beneficial in locations with high concentrations of people where people are more anonymous, while inequality is detrimental in places where people are less concentrated and thus less anonymous. Fallah and Partridge (2007) provide some evidence to support this theory, but a narrow geographic definition of metropolitan and nonmetropolitan counties limits the ability to fully describe a potential ASA curve and to know where on the curve the inequality and growth relationship changes.

Looseness of Concepts

Another obstacle to clearly understanding the relationship between inequality and growth boils down to a looseness of concepts regarding inequality and growth. Theoretical arguments generally point to the inequality of wealth as the ideal concept of inequality on which to focus. However, due to data availability and comparability issues, income inequality ends up being used as a proxy for wealth and the focus of most analyses. While income-based measures of inequality are available, they too are subject to a "fuzzy" definition of income. Difficulties accurately measuring all of the potential sources of income has sparked debate about recent trends in income inequality (Auten and Splinter, 2019; Piketty et al, 2018). Relatedly, income is often

measured before taxes and transfers, such that it may not accurately reflect all of a household's available resources, thus overstating the level of income inequality (Meyer and Sullivan, 2003; Meyer and Sullivan, 2007). Similarly, different sources of information can be used to produce estimates of income inequality. Census Bureau data are based on surveys and tend to underreport income (Rector et al., 1999; Meyer et al., 2009), especially retirement and investment income (Bee and Mitchell, 2017; Brady and Bass, 2021) and income at the top of the income distribution (Donovan, 2015; Larrimore et al., 2021). But the Census Bureau does produce publicly available estimates of income inequality at the county level. Conversely, the Internal Revenue Service tax return data are based on administrative records for all individuals required to file a tax return, which tends to improve coverage at the top of the income distribution, in exchange for less coverage of the low end of the income distribution (Donovan, 2015). The IRS data are publicly available, but estimates of income inequality are not computed at any geographic level.

Additional nuance can be found in the metrics for inequality. First, there are numerous statistical measures designed to capture different aspects of inequality across a distribution, yet they can be difficult to interpret. For example, a Gini coefficient, the statistical measure designed to capture income inequality across the entire distribution, is widely used, even though it is not generally well understood. More practically, measures of inequality can also refer to inequality in different parts of the income distribution, for example, inequality in the top half of the income distribution or the share of income held by the middle quintile of the income distribution. There are also alternative dimensions of inequality, such as gender, race, and opportunity, that have become popular, but little is empirically known about how they are related to growth; future research ought to explore how these different dimensions of inequality are related to growth.

Shifting to growth, there has been less variation in concept, but still some noteworthy differences. The concept of growth is relatively straightforward, but differences can be found in how growth is captured and measured. Cross-country analyses tend to rely on gross domestic product (GDP) to capture and measure growth, while subnational analyses focus on income per capita. The two are closely related; GDP refers to the total market value of final goods and services domestically produced in a specific location and time, whereas income per capita refers to the total amount of income distributed across the population in a specific location and time. More simply, GDP captures production and output of a location, while per capita income (or average income) has been used as a proxy for the standard of living or quality of life in a location. Alternatively, income can also be considered at the median or household level. The length of time associated with growth is also important to keep track of when assessing the inequality and growth relationship. For example, growth over a 5-year period versus growth over a 20-year period reflects different conceptual ideas (short versus long term) of growth that also could impact the inequality and growth relationship. The length of the growth spell (months, years) has also been of interest, as it is believed that longer growth spells can reduce inequality (Benner and Pastor, 2015). Lastly, albeit a more technical concept, growth can be computed as a percentage change or log-difference; the log-difference results are not shown, but the overall patterns in the income inequality and economic growth relationship are similar.

Location or geography is another area where differing concepts can influence the income inequality and economic growth relationship. Countries, states, metropolitan statistical areas, and counties can all be units of analysis, yet it is unclear what geographic level is most appropriate for studying this relationship. What is clear though is that by using a smaller geographic unit, such as a county, one has access to high-quality data. Furthermore, incorporating a range of

county types (rural, micropolitan, outlying and central metropolitan counties) allows for a nuanced understanding of how the relationship varies across place.

DATA AND METHODOLOGY

This section describes the data, recent trends, and methods used in this analysis. A majority of the data are from the United States Census Bureau, retrieved using American Factfinder, IPUMS, and the Census Bureau website. Other data are from the Bureau of Labor Statistics, the Bureau of Economic Analysis, and the United States Development Authority. All data are collected for every county in the United States for 1990, 2000, and 2010, creating a panel structure for the data set.

Geographic Classifications

The geographic designation of counties is an important facet of this analysis. Previous research examining the relationship between income inequality and economic growth restricted county classifications to metropolitan and nonmetropolitan counties using the 1999 metropolitan statistical area (MSA) definitions from the Office of Management and Budget (OMB). While the 1999 MSA definitions are useful, the two groups limit the ability to describe how the relationship varies along the proposed ASA curve. The 2010 OMB definitions provide a broader geographic classification of counties through which to observe the relationship. For instance, nonmetropolitan counties can be further segmented into micropolitan and rural counties using the 2010 definitions. Fallah and Partridge (2007) also explore how the relationship varies within metropolitan areas using a central versus outlying county designation. They note that central metropolitan counties have a positive relationship, while outlying counties experience a negative relationship, but they do not fully explore this distinction. In addition to the central and outlying metropolitan county designations, one additional geographic designation divides central

metropolitan counties into quintiles using a county's population density in 2010. The classification of all counties into eight different county types (rural, micropolitan, outlying metropolitan, and five quintiles of central metropolitan counties) allows for a better description of how the relationship varies across locations.

Figure 1: Map of County Classification, 2010

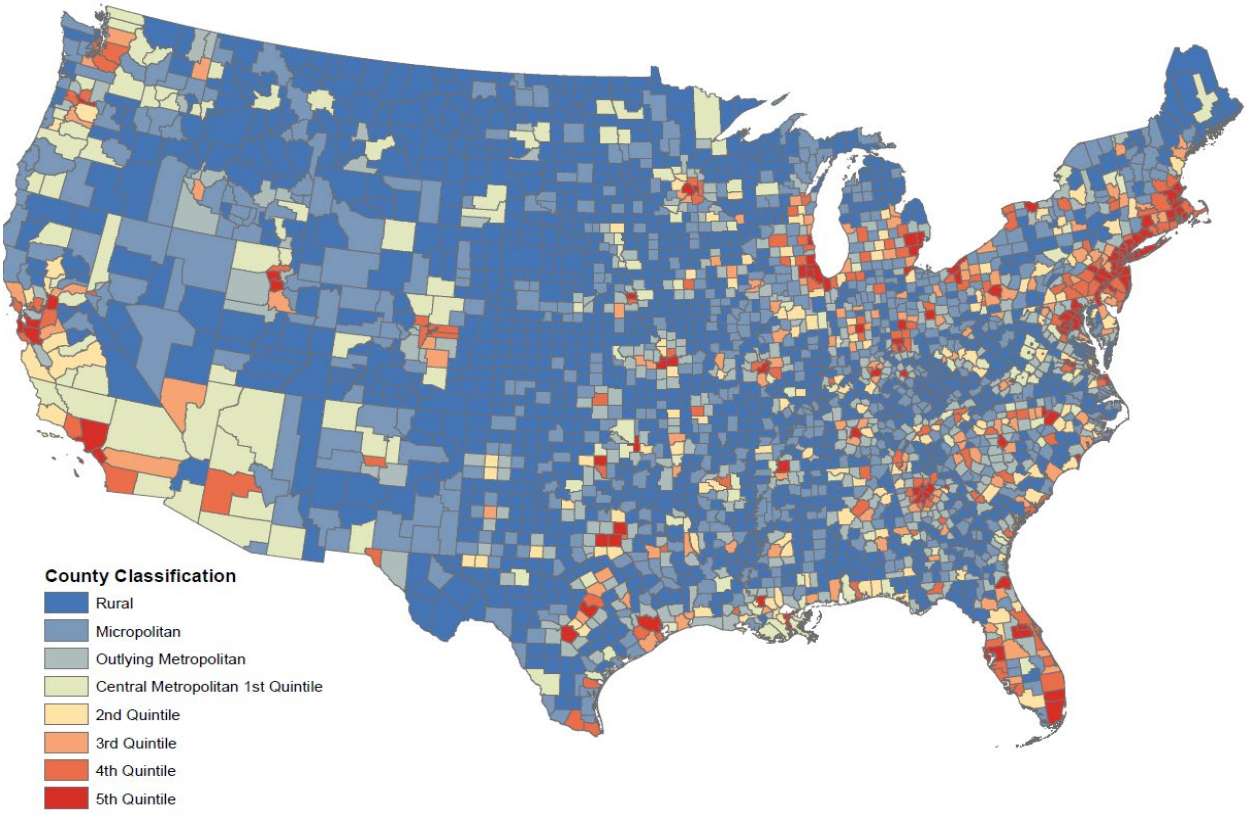


Figure 1 above displays the geographic classification of counties. At 1,343 rural counties are the largest group, accounting for 43 percent of all observations in the sample. Central metropolitan counties are the next largest group, at 728 counties (23 percent), but those are divided into five groups (approximately 145 counties each) based on population density in 2010. The fifth quintile is of interest in this analysis and includes counties in 67 different metropolitan

statistical areas.[2] Approximately 38 percent of the national population lives in the top 20 percent of central metropolitan counties. The 641 micropolitan counties account for 20 percent of the sample, while 438 outlying metropolitan counties cover the remaining 14 percent of the sample.

Income Inequality

Income inequality is measured using two approaches. First, a Gini coefficient provides a measure of the dispersion of income throughout the whole distribution; a Gini coefficient is the most common measure of income inequality used in the literature. Gini coefficient values range from 0 to 1, with higher values equating to greater inequality. The income-based Gini coefficient used represents pre-tax income and thus excludes taxes, credits, and government transfers. Table 1 presents the population-weighted average Gini coefficient across geographic classifications for 1990, 2000, and 2010. Overall, income inequality is generally highest in dense central metropolitan counties; however, in 1990, rural counties were relatively unequal, too (0.438). In terms of changes over time, income inequality generally increased from 1990 to 2010. However, looking at income inequality across all geographic classifications reveals that income inequality

[2] Akron, OH; Allentown-Bethlehem-Easton, PA-NJ; Athens-Clarke County, GA; Atlanta-Sandy Springs-Roswell, GA; Austin-Round Rock, TX; Baltimore-Columbia-Towson, MD; Baton Rouge, LA; Blacksburg-Christiansburg-Radford, VA; Boston-Cambridge-Newton, MA-NH; Bridgeport-Stamford-Norwalk, CT; Charlotte-Concord-Gastonia, NC-SC; Charlottesville, VA; Chicago-Naperville-Elgin, IL-IN-WI; Cincinnati, OH-KY-IN; Cleveland-Elyria, OH; Columbus, OH; Dallas-Fort Worth-Arlington, TX; Dayton, OH; Denver-Aurora-Lakewood, CO; Detroit-Warren-Dearborn, MI; Durham-Chapel Hill, NC; Harrisonburg, VA; Hartford-West Hartford-East Hartford, CT; Houston-The Woodlands-Sugar Land, TX; Indianapolis-Carmel-Anderson, IN; Jacksonville, FL; Kansas City, MO-KS; Lexington-Fayette, KY; Los Angeles-Long Beach-Anaheim, CA; Louisville/Jefferson County, KY-IN; Lynchburg, VA; Memphis, TN-MS-AR; Miami-Fort Lauderdale-West Palm Beach, FL; Milwaukee-Waukesha-West Allis, WI; Minneapolis-St. Paul-Bloomington, MN-WI; Nashville-Davidson-Murfreesboro--Franklin, TN; New Haven-Milford, CT; New Orleans-Metairie, LA; New York-Newark-Jersey City, NY-NJ-PA; Ogden-Clearfield, UT; Oklahoma City, OK; Omaha-Council Bluffs, NE-IA; Orlando-Kissimmee-Sanford, FL; Philadelphia-Camden-Wilmington, PA-NJ; Pittsburgh, PA; Portland-Vancouver-Hillsboro, OR-WA; Providence-Warwick, RI-MA; Raleigh, NC; Richmond, VA; Roanoke, VA; Rochester, NY; Sacramento--Roseville-Arden-Arcade, CA; Salt Lake City, UT; San Antonio-New Braunfels, TX; San Francisco-Oakland-Hayward, CA; San Jose-Sunnyvale-Santa Clara, CA; St. Louis, MO-IL; Staunton-Waynesboro, VA; Tampa-St. Petersburg-Clearwater, FL; Toledo, OH; Trenton, NJ; Tulsa, OK; Urban Honolulu, HI; Virginia Beach-Norfolk-Newport News, VA; Washington-Arlington-Alexandria, DC-VA; Wilmington, NC; Winchester, VA-WV

tended to decline in rural counties over this period, while it increased in micropolitan and metropolitan counties. Within metropolitan counties, central counties saw income inequality increase more than outlying counties, with the densest central counties seeing inequality increase the most. Broadly speaking, income inequality increased more in higher density counties from 1990 to 2010.

Table 1: Average Income Gini Coefficient by Geography by Year

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	0.428	0.438	0.424	0.428	0.406	0.430	0.421	0.423	0.419	0.415	0.440
2000	0.445	0.441	0.434	0.446	0.416	0.449	0.436	0.435	0.431	0.434	0.463
2010	0.448	0.434	0.435	0.450	0.420	0.453	0.435	0.439	0.435	0.441	0.468
% change from 1990-2010	4.5%	-1.0%	2.5%	5.2%	3.4%	5.4%	3.2%	3.6%	3.9%	6.2%	6.3%

Source: Census Bureau. Average values are population weighted.

The second approach to measuring income inequality seeks to separately capture inequality in the top and bottom halves of the income distribution. Ratios are computed using the mean incomes for each quintile of the income distribution such that a low-end ratio compares income at the 10th percentile with the median income, while a top-end ratio compares the median income with income at the 90th percentile. Income in this case is also pre-tax. Tables 2 and 3 present the average low- and high-end ratios across geographies for 1990, 2000, and 2010. In general, inequality is larger in the bottom half of the income distribution than in the top half. However, that difference narrowed as inequality tended to increase more in the top half of the income distribution than in the bottom half from 1990 to 2010. Looking across geographies, denser counties generally have higher levels of inequality in the bottom half of the income distribution while also seeing larger increases over time. In fact, rural, micropolitan, and outlying metropolitan counties all saw low-end inequality decrease from 1990 to 2010. Turning to inequality in the top half of the income distribution, a similar pattern of higher levels of inequality along with larger increases in inequality is observed in denser counties. These

patterns are consistent with the existing narratives of increasing income inequality, driven by the top half of the income distribution.

Table 2: Average Low-End Ratio by Geography by Year

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	4.23	4.31	4.17	4.23	4.10	4.24	4.10	4.11	4.13	3.98	4.41
2000	4.20	4.21	4.11	4.21	3.97	4.23	4.04	4.04	4.01	3.91	4.48
2010	4.24	4.02	4.11	4.27	4.01	4.29	4.08	4.09	4.12	4.12	4.48
% change from 1990-2010	0.2%	-6.7%	-1.5%	0.9%	-2.1%	1.2%	-0.5%	-0.5%	-0.2%	3.5%	1.5%

Source: Census Bureau. Average values are population weighted.

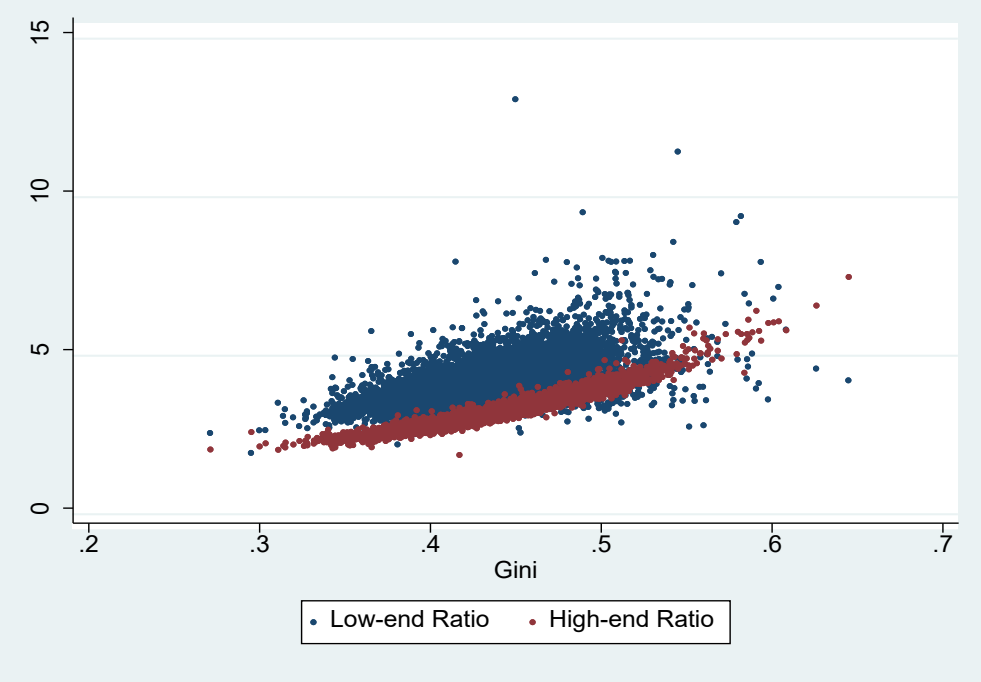
Table 3: Average High-End Ratio by Geography by Year

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	2.95	3.06	2.89	2.94	2.69	2.96	2.85	2.88	2.83	2.82	3.08
2000	3.18	3.10	3.03	3.20	2.83	3.23	3.06	3.06	3.01	3.07	3.40
2010	3.21	3.06	3.05	3.24	2.87	3.27	3.04	3.10	3.05	3.13	3.46
% change from 1990-2010	9.0%	0.2%	5.6%	10.0%	6.6%	10.4%	6.6%	7.4%	7.7%	10.8%	12.3%

Source: Census Bureau. Average values are population weighted.

Plotting and comparing the two approaches to measuring inequality shows that the methods produce similar pictures of income inequality in a county, while variation in the low-end ratio introduces additional information (Figure 2). Inequality in both the bottom and the top half of the income distribution is highly correlated with a county's Gini coefficient, but a tighter relationship exists between the top half of the income distribution and a Gini coefficient (correlation: 0.97 versus 0.73). So while the Gini coefficient and the top-end ratio are likely to have a similar relationship with growth, the low-end ratio shows additional variation in the inequality data that can be exploited when assessing the relationship between income inequality and growth.

Figure 2: Comparing Income Inequality Measures, 1990, 2000, and 2010



Source: Census Bureau.

Collectively, these two approaches show that income inequality increased over time, driven by increasing inequality in the top half of the income distribution, primarily taking place in the densest counties. These patterns suggest that a geographic component to inequality exists, one that may influence the nature of the relationship between income inequality and economic growth. There also appears to be additional information about income inequality in the bottom half of the income distribution to exploit.

Per Capita Income Growth

In this analysis, economic growth is measured using per capita income over 10-year intervals. Table 4 presents the average growth rate for each decade across geographies. In terms of levels, growth rates tended to be higher in less dense counties during the 1990s but that differential disappeared as average growth rates converged across geographies in the 2000s and 2010s. Growth also slowed markedly over the three decades. On average, growth rates across all

counties declined by roughly 50 percent from the 1990s to the 2010s. Rural and micropolitan counties experienced larger declines than metropolitan counties. And within metropolitan counties, the largest declines took place in outlying and the least dense central counties.

Table 4: Average Per Capita Income Growth by Decade

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990s	0.502	0.604	0.553	0.487	0.575	0.480	0.503	0.516	0.517	0.515	0.450
2000s	0.247	0.278	0.243	0.245	0.249	0.245	0.266	0.259	0.233	0.237	0.246
2010s	0.261	0.254	0.253	0.262	0.268	0.261	0.249	0.253	0.246	0.257	0.270
% change from 1990-2010	-48.1%	-57.9%	-54.2%	-46.3%	-53.5%	-45.6%	-50.4%	-51.1%	-52.3%	-50.0%	-40.0%

Source: Census Bureau. Average values are population weighted.

The Income Inequality and Growth Relationship

The trends described above continue to sow confusion around the relationship between income inequality and economic growth, by providing justification for both a positive and a negative relationship between the two. In aggregate, one can observe a negative relationship, as higher levels of inequality over time align with lower levels of growth. Conversely, there is evidence of a positive relationship if one looks across geography. For example, the densest central metropolitan counties tend to have the highest levels of income inequality and the highest rates of growth. The same positive relationship, while less obvious, can also be observed in rural counties, as both the level of income inequality and the rate of growth declined over the sample period.

The relationship between income inequality and growth can be more directly observed using correlation coefficients, but those, too, do not provide a great deal of clarity either. Tables 5, 6, and 7 present the correlation coefficients for each of the inequality measures and income per capita growth across geographies and over time. Overall, there is little consistency in the relationship over time and across geographies, with the inequality in the lower half of the income

distribution generally exhibiting a stronger/tighter relationship with growth than the inequality in the top half.

When a Gini coefficient is used, the relationship between income inequality and growth varies over time and across geographies. This is most simply observed in the first column of Table 5. The relationship across all counties is negative during the 1990s and then turns positive in the later decades; this time-varying pattern is also generally observed across geographies as the directionality of the relationship changes after the 1990s. It is clear from Table 5 that this relationship also differs by geography. The relationship between income inequality and growth in rural and micropolitan counties tends to be the opposite of that in metropolitan counties. During the 1990s, there was little correlation present in rural and micropolitan counties, but an inverse relationship in metropolitan counties. In the subsequent decades, the correlation in rural and, to a lesser extent, in micropolitan counties turned negative, while metropolitan counties exhibited a positive relationship. Within metropolitan counties, correlation coefficients differ between outlying and central counties. In the 1990s, there was a positive correlation in outlying metropolitan counties and a negative correlation in central metropolitan counties; this pattern flipped in the 2000s. In the 2010s, a correlation (positive) was evident only in central metro counties. Correlation coefficients also vary within central metro counties. While most central metro counties tend to have a negative relationship, the densest central metro counties present the strongest positive correlation in the table during the 2000s and 2010s, such that any positive relationship seems to be driven by the densest central metropolitan counties.

Table 5: Gini and Growth Rate Correlation Coefficients by Year

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	-0.13	0.00	0.01	-0.16	0.19	-0.15	0.01	-0.18	-0.14	-0.15	-0.04
2000	0.07	-0.20	-0.03	0.12	-0.16	0.16	-0.08	-0.05	-0.03	-0.06	0.31
2010	0.08	-0.25	-0.18	0.14	0.01	0.16	-0.18	-0.21	-0.15	-0.06	0.29

Source: Census Bureau. Population-weighted values.

Turning to inequality in different parts of the income distribution, a similar dynamic of the inequality-growth relationship varying over time and across geographies is observed. Correlation coefficients for inequality at the low and high ends of the income distribution tend to mirror the correlation coefficients for inequality in the bottom half of the distribution, leaning more positive, even when there is a negative correlation coefficient. For example, across all counties (column 1 in Tables 6 and 7) the correlation coefficient is -0.04 for the low-end inequality and -0.13 for high-end inequality in the 1990s. In the following decades, the directionality changes, as it did when using a Gini coefficient, but the positive correlation is stronger for low-end inequality than it is for inequality in the top half of the income distribution. The tendency for the low-end ratio to skew positive can be found across all geographies and suggests that the positive relationship may be driven by inequality in the bottom half of the income distribution.

Table 6: Low-End Ratio and Growth Rate Correlation Coefficients by Decade

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	-0.04	0.05	0.04	-0.05	0.31	-0.06	0.13	0.28	0.01	-0.01	-0.01
2000	0.18	-0.10	0.02	0.25	0.03	0.28	0.04	-0.02	0.08	0.13	0.39
2010	0.22	-0.10	-0.03	0.29	0.07	0.32	-0.10	-0.05	0.12	0.04	0.47

Source: Census Bureau. Population-weighted values.

Table 7: High-End Ratio and Growth Rate Correlation Coefficients by Decade

	All	Rural	Micropolitan	Metropolitan	Metro Counties		Central Metropolitan Counties				
					Outlying	Central	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
1990	-0.13	0.00	0.01	-0.16	0.14	-0.15	0.02	-0.28	-0.15	-0.15	-0.02
2000	0.06	-0.20	-0.03	0.11	-0.17	0.14	-0.09	-0.05	-0.06	-0.12	0.29
2010	0.06	-0.24	-0.18	0.11	0.01	0.13	-0.17	-0.21	-0.17	-0.07	0.21

Source: Census Bureau. Population-weighted values.

Overall, correlation coefficients help to confirm some of the nuance and complexity of evaluating the relationship between income inequality and economic growth. However, the nature of the relationship is not entirely clear without properly accounting for other factors that could influence per capita income growth.

Empirical Specification

A reduced-form conditional economic growth model is used to further clarify the relationship between income inequality and economic growth. In this model, growth is a function of a county's initial conditions and requires controlling for a variety of factors (economic conditions, amenities, demographics, and industry structure) that may influence the rate of growth. Using initial conditions to explain subsequent growth should limit endogeneity concerns, but one should be cautious around any causal interpretations in this framework. Remember that this analysis does not intend to pursue causality but rather to explore how the relationship varies across different geographies, with a primary interest in the directionality of the relationship as opposed to the magnitude of each coefficient. This approach closely follows Fallah and Partridge (2007) and expands on it by bringing in additional years of data and using the 2010 OMB definitions to broaden the geographic classification of counties. While improvements to the model specification are possible, at this time, the desire to be consistent and comparable with the existing literature is the priority and any improvements are saved for future work (see the Discussion section for more on potential model improvements).

Equation 1 presents the common reduced-form growth model used in this analysis. The panel structure of the data allows for a variety of estimation specifications of this baseline model and are further discussed below. The dependent variable *Growth* is the percent change in the per capita income over the next 10 years in county (i) in state (s) at time (t).

Equation 1:

$$Growth_{ist} = B_1 Inequality_{ist} + B_2 Income_{ist} + B_3 Industry_{ist} + B_4 Demographics_{ist} + B_5 Amenity_{ist} + e_{ist}$$

Inequality, the independent variable of interest, is incorporated in two ways. The first set of findings is derived from a series of models estimated using an income Gini coefficient as a measure of inequality across the entire income distribution. And the second set of findings comes from an additional set of models estimated using ratios (10^{th}-50^{th} percentile income and 50^{th}-90th percentile income) to capture inequality in different parts of the income distribution.

The remaining variables are included in all estimation specifications. *Income* includes two measures. The logarithm of per capita income is included to account for the convergence of growth rates across counties, and a spatial lag of the logarithm of per capita income is included to account for any spillover effects from neighboring counties. The spatial lag uses a spatial weights matrix of counties within 300 miles to produce a distance-weighted mean per capita income of surrounding counties. The use of a spatial lag helps to alleviate any concerns about spatial autocorrelation biasing the results. *Industry* includes local industry employment shares to account for a county's industrial structure and relative demand for goods and services. *Demographics* includes several variables accounting for the age, educational attainment, racial composition, and size of the local workforce. *Amenity* refers to natural amenities as captured by the United States Development Authority (USDA). The USDA's natural amenities scale is based

on 6 factors: warm winter; winter sun; temperate summer; low summer humidity; topography; and water area.

There are additional specification features to consider. As in Fallah and Partridge (2007), state fixed effects are used to account for unobservable variables across states. Additional years of data allow for time fixed effects to be incorporated when not looking at changes in the income inequality-growth relationship over time. Standard errors are clustered according to each metropolitan, micropolitan, and rural area of the state to address concerns of biased results due to spatially correlated residuals. And both population-weighted and unweighted specifications are presented, with unweighted specifications used to motivate additional exploration of finer levels of geographic classification. Fallah and Partridge (2007) describe population-weighted specifications as representing the experience of the average person, whereas unweighted specifications represent the experience of the average county.

Cross-sectional and fixed effect approaches have been found to produce conflicting results. Cross-sectional approaches tend to find a positive relationship between inequality and growth, while fixed effects specifications tend to indicate the lack of a statistical relationship between the two (Partridge, 1997; Dev Bhatta, 2001; Panizza, 2002; Partridge, 2005). These methodological differences can be attributed to how one thinks about short- versus long-term growth. Fixed-effects models are thought to better reflect inequality's impact on growth in the short to medium run, while cross-sectional models better reflect the longer-term and more persistent impact of inequality on growth (Barro, 2000; Forbes, 2000; Partridge, 2005).

Despite these differences, there are reasons to favor the cross-sectional results over those produced from fixed-effects models. Cross-sectional models are thought to better portray the long-run processes of growth economics (Barro 2000). From a technical perspective, if most of

the variation in inequality is observed across counties rather than over time for a single county, fixed-effects models could produce biased results (Barro, 2000). Similarly, if the level of inequality in a county is persistent over time, fixed-effects models would capture the variable's explanatory power and limit its potential effect on growth. For reference, the county income Gini coefficients used in this analysis are highly correlated over the years; population-weighted correlation coefficients are greater than 0.86. Relatedly, if there is any error in measurement of the income distribution, fixed-effects models would amplify that error and produce unreliable results (Fallah and Partridge, 2007). Cross-sectional methods are preferred because they tend to convey a greater level of confidence, as those results are more robust to specification changes within and across models (Partridge, 2005). However, county fixed effects are used in select specifications to compare results across model types. Specifications combining county and time fixed effects equate to a difference-in-differences estimation.

Table 8: Summary Statistics by Geography, 2000

	Rural		Micropolitan		Metropolitan	
Income per capita growth	0.278	(0.125)	0.243	(0.0978)	0.245	(0.0719)
Gini	0.441	(0.0386)	0.434	(0.0346)	0.446	(0.0392)
Low-end Ratio	4.207	(0.876)	4.114	(0.669)	4.215	(0.772)
High-end Ratio	3.105	(0.446)	3.031	(0.374)	3.202	(0.474)
Income per capita	15879.6	(2460.1)	17269.8	(3044.5)	22514.4	(5156.1)
Log(Income per capita) spatial lag	9.725	(0.0989)	9.757	(0.111)	9.899	(0.160)
% with high school diploma	0.371	(0.0546)	0.351	(0.0666)	0.271	(0.0647)
% with some college	0.189	(0.0420)	0.202	(0.0424)	0.214	(0.0372)
% with Bachelor's degree	0.0861	(0.0324)	0.106	(0.0410)	0.166	(0.0527)
% with Graduate degree	0.0433	(0.0169)	0.0581	(0.0271)	0.0952	(0.0412)
Amenity value	3.393	(0.953)	3.499	(1.119)	4.079	(1.412)
Population	22620.0	(13903.5)	55344.3	(29364.9)	1233660.6	(1986245.9)
% Asian	0.00359	(0.00769)	0.00998	(0.0357)	0.0436	(0.0567)
% Black	0.0905	(0.159)	0.0787	(0.135)	0.131	(0.128)
% Native American	0.0245	(0.0914)	0.0179	(0.0635)	0.00655	(0.0142)
% White	0.852	(0.178)	0.851	(0.159)	0.732	(0.164)
% Hispanic	0.0419	(0.0937)	0.0633	(0.125)	0.139	(0.153)
Age 16-24	0.105	(0.0218)	0.122	(0.0406)	0.118	(0.0274)
Age 25-34	0.116	(0.0180)	0.124	(0.0161)	0.146	(0.0211)
Age 35-44	0.150	(0.0118)	0.151	(0.0129)	0.162	(0.0133)
Age 45-54	0.137	(0.0131)	0.136	(0.0146)	0.133	(0.0121)
Age 55-64	0.104	(0.0152)	0.0941	(0.0131)	0.0840	(0.0117)
Age 65+	0.160	(0.0341)	0.141	(0.0287)	0.120	(0.0341)
% Agriculture & Mining	0.0805	(0.0559)	0.0449	(0.0368)	0.0122	(0.0198)
% Construction	0.0796	(0.0227)	0.0721	(0.0190)	0.0667	(0.0184)
% Manufacturing	0.180	(0.0970)	0.187	(0.0956)	0.132	(0.0604)
% Transportation	0.0552	(0.0180)	0.0489	(0.0155)	0.0525	(0.0158)
% Trade	0.141	(0.0221)	0.151	(0.0199)	0.155	(0.0188)
% FIRE	0.0381	(0.0108)	0.0418	(0.0118)	0.0732	(0.0228)
% Information	0.0153	(0.00767)	0.0177	(0.00615)	0.0329	(0.0140)
% Professional & Business services	0.0409	(0.0133)	0.0503	(0.0151)	0.100	(0.0314)
% Arts, Accommodation & Food services	0.0674	(0.0306)	0.0781	(0.0331)	0.0799	(0.0282)
% Education and Health services	0.202	(0.0415)	0.210	(0.0473)	0.199	(0.0374)
% Other services	0.0474	(0.00921)	0.0478	(0.00765)	0.0492	(0.00681)
% Public Administration	0.0528	(0.0275)	0.0504	(0.0315)	0.0479	(0.0251)
Observations	1334		641		1166	

Standard deviation in parentheses

FINDINGS

The first set of findings relies on the income Gini coefficient as a measure of income inequality, while the second set features findings that use a low- and high-end income ratio. Tables and figures featuring the beta coefficients for each measure of income inequality are used to present findings, but all regression output tables can be found in the appendix.

Income Inequality Measured Using an Income Gini Coefficient

A broader geographic classification of US counties and additional years of observations confirm and build upon the notion that the relationship between income inequality and growth varies across geographies (Fallah and Partridge, 2007). Mirroring the empirical specification aids

comparability and discussion, yet potential model improvements could alter these findings, and these improvements will be taken up in future research. Expanding the geographic classification of counties from a dichotomous metropolitan and nonmetropolitan county framework to a broader one shows that the inequality-growth relationship varies within metropolitan counties; a positive relationship between income inequality and growth is only found in the densest central metropolitan counties. Additional years of observation show that this overall pattern is largely stable from the 1990s to the 2010s, but it does not hold up to the inclusion of county fixed effects.

Using the slightly expanded geographic classification of rural, micropolitan, and metropolitan counties confirms that the income inequality and economic growth relationship varies across counties. However, this pattern is sensitive to the use of population weights. Figure 3 presents the beta coefficients for inequality as measured using an income Gini coefficient for population-weighted (left side) and nonweighted specifications (right side). Population-weighted specifications are most similar to Fallah and Partridge (2007) and confirm that the relationship between income inequality and growth varies across geographies; the magnitude of the coefficients is similar as well and is included in parentheses for reference. A negative relationship in rural (-0.902) and micropolitan counties (-0.902) is consistent with the pattern previously observed in nonmetropolitan counties (-0.632). Again, similar to Fallah and Partridge's (2007) finding for metropolitan counties (0.670), a positive relationship is observed (0.622) in population-weighted specifications. However, the relationship turns negative in nonweighted specifications (-0.447), suggesting further exploration of how the relationship may vary within metropolitan counites.

Figure 3: Income Gini Coefficient Beta Coefficients

Source: Census Bureau.

Note: Pooled sample including all three decades of data. Bar lengths represent the 90 percent confidence intervals for each point estimate.

Dividing metropolitan counties into central and outlying metro counties shows that the income inequality and economic growth relationship also varies within metropolitan counties. Fallah and Partridge (2007) found a similar dynamic (0.770 in central counties and -0.112 in suburban counties) but did not include both population-weighted and unweighted specifications. Table 9 presents the beta coefficients for central and outlying metropolitan counties in population-weighted and unweighted specifications. A negative relationship is observed in outlying metropolitan counties in both weighted (-0.685) and unweighted specifications (-1.067). In central metropolitan counties, a positive relationship is observed in the population-weighted specification (0.726), but there is no statistically significant relationship found in the

unweighted specification (0.121), indicating that the relationship may still vary within central metropolitan counties.

Table 9: Income Gini Coefficient Beta Coefficients, Central and Outlying Metropolitan Counties

Metro Counties: Central Vs Outlying Counties

	Central	Central-UNWGHT	Outlying	Outlying-UNWGHT
Gini	0.726***	0.121	-0.685***	-1.067***
	(0.001)	(0.429)	(0.001)	(0.000)
Observations	2168	2168	1308	1308
R-squared	0.753	0.789	0.808	0.783

p-values in parentheses
Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.
* p<0.1, ** p<0.05, *** p<0.01

Dividing central metropolitan counties into quintiles based on the population density in 2010 illustrates how the relationship varies within central metropolitan counties. Figure 4 displays the inequality beta coefficients for the least population dense to the most population dense central metropolitan counties in the United States. The left side of this figure shows that a positive relationship between inequality and growth is only observed in the densest central metropolitan counties (1.487), while less population dense central counties exhibit a statistically insignificant or negative relationship. Based on the quintile values, the positive relationship between inequality and growth is observed in central metropolitan counties with population densities greater than 915 people per square mile. The pattern is observed in the top 20 percent of central metropolitan counties and about 5 percent of all counties. Interestingly, the point estimate for the densest central metropolitan counties (1.487) is roughly double the value for all central metropolitan (0.726) and metropolitan counties (0.622). A similar pattern is observed in unweighted specifications, providing additional confidence that this may be the underlying pattern driving the positive relationship found for all metropolitan counties (right side).

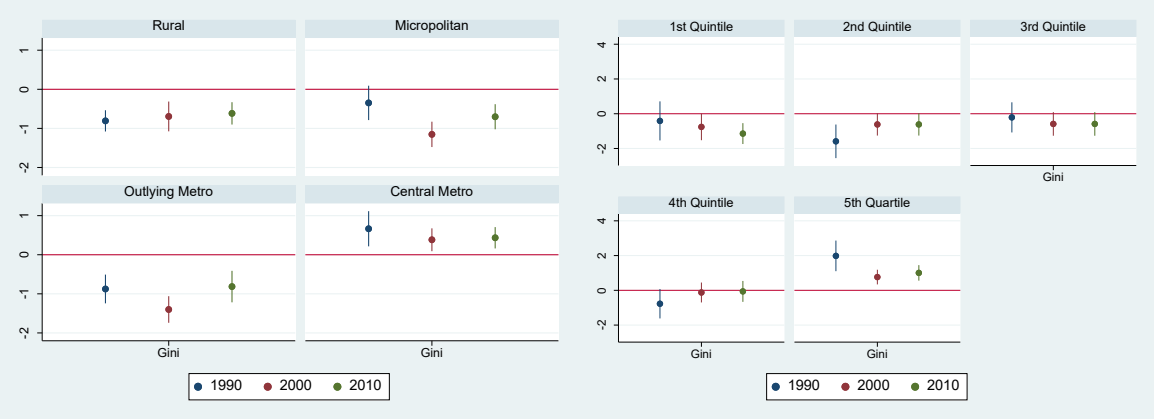
Figure 4: Income Gini Coefficient Beta Coefficients, Central Metro Quintiles

Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

With this overall pattern established, how stable it is over time? Separate models are run for each decade, and Figure 5 presents the beta coefficients for each geography in the 1990s, 2000s, and 2010s. The left side of Figure 5 contains coefficients for rural, micropolitan, outlying metropolitan and central metropolitan counties, whereas the right side displays the coefficients for quintiles of central metropolitan counties. While there is some movement in the magnitudes of the coefficients over the decades, they are generally statistically similar over time. The negative relationship between income inequality and growth found in rural, micropolitan, and outlying central metropolitan counties is consistently observed in each decade. Similarly, a positive relationship is found in central metropolitan counties in each decade when using

population weights; however, although not shown, there is no statistical relationship without population weights. Disaggregating the central metropolitan counties reveals only that the most population dense ones exhibit a statistically significant positive relationship in each decade. Interestingly, the most movement in the beta coefficients over the years took place in the most dense central metropolitan counties. And even though the point estimate declined from 1.98 in the 1990s to 1.1 in the 2010s, the estimates are statistically similar.

Figure 5: Income Gini Coefficient Beta Coefficients, All Geographies, Over Time

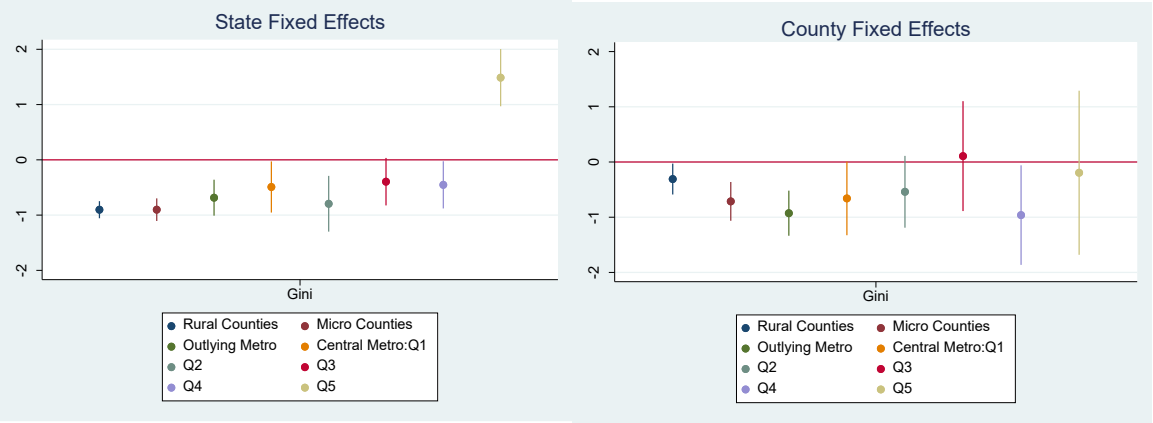


Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

While there appears to be some stability over time, the overall pattern of the relationship varying across geographies does not hold up to the inclusion of county-level fixed effects. Yet there are some consistencies observed in specific geographies. Figure 6 presents the beta coefficients for state fixed-effects specifications (left side) and for county fixed-effects specifications (right side). Starting with rural counties, a negative relationship continues to be observed, but the point estimate and confidence level declines (-0.902, -0.309). In micropolitan and outlying metropolitan counties, a negative relationship of similar magnitude is observed in both levels of geographic fixed effects. There are also some similarities within central metropolitan counties (no statistical relationship in the third quintile and a negative relationship

in the fourth quintile are observed in both specifications); however, the positive relationship found in the densest central metropolitan counties does not hold up when county fixed effects are incorporated. While not shown in Figure 6, all metropolitan county specifications differ in this manner as well. All metropolitan county models with state fixed effects would indicate a positive relationship, yet there is no statistical relationship observed when county fixed effects are incorporated. These findings confirm that the income inequality and growth relationship is indeed sensitive to the inclusion of county fixed effects.

Figure 6: Income Gini Coefficient Beta Coefficients, All Geographies, State and County Fixed Effects



Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

The relationship between income inequality and economic growth varies across geographies when using an income Gini coefficient to measure inequality. A negative relationship is found in rural, micropolitan, outlying metropolitan counties, and less population dense central metropolitan counties, while a positive relationship is observed in the densest central metropolitan counties. These are economically meaningful relationships, too. A one standard deviation change in the income Gini coefficient translates to 11 and 12 percent less growth in rural and micropolitan counties, respectively, and 20 percent more growth in the

densest central metropolitan counties. The overall pattern across geographies does appear to be stable over time but fails to hold up to the use of county fixed effects. The negative relationship in rural, micropolitan, and outlying metropolitan counties is consistent across different levels of fixed-effects specifications, indicating greater confidence in a negative relationship between income inequality and growth than a positive one. However, as described above, the use of county fixed effects may not be appropriate when estimating per capita income growth.

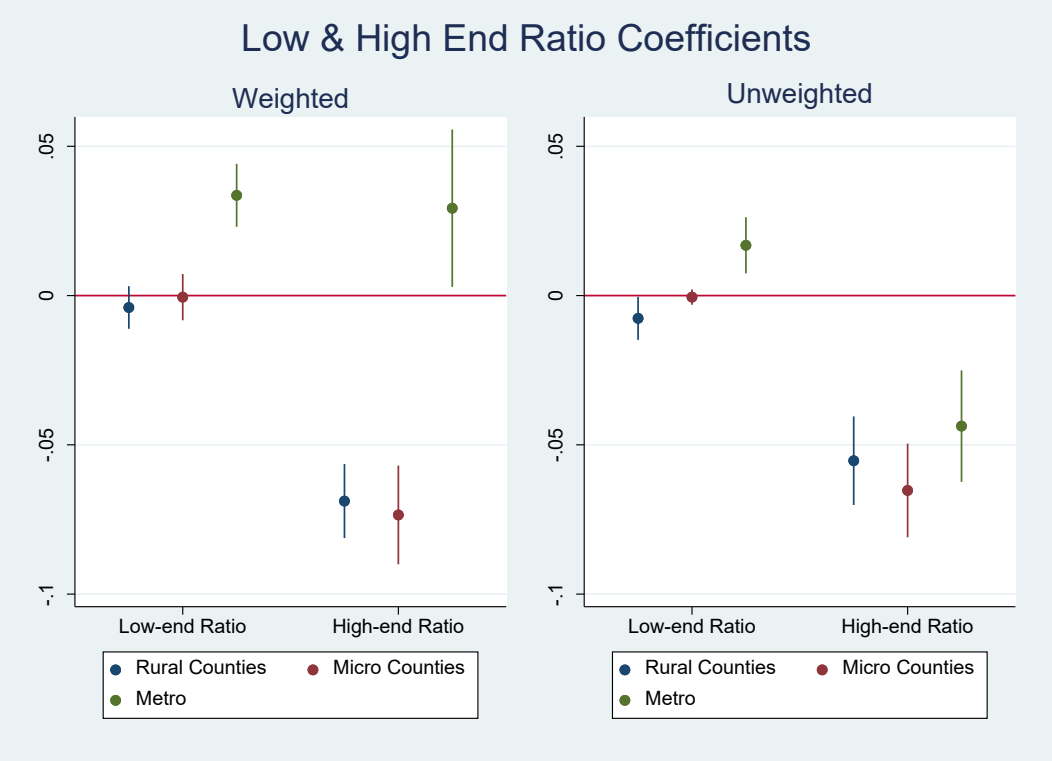
Inequality Measured Using Low- and High-End Income Ratios

Incorporating inequality measures designed to separately capture inequality in the top and bottom halves of the income distribution reveals some interesting nuances for understanding how the relationship between income inequality and economic growth varies across geographies. In rural, micropolitan, and outlying central metropolitan counties, inequality in the bottom half of the income distribution has no statistical relationship with growth, while inequality in the top half of the income distribution exhibits a negative relationship. Within central metropolitan counties, low-end inequality has a positive relationship with growth and high-end inequality has a negative one, except for the most population dense central metropolitan counties, which show a positive relationship for both measures. These patterns are largely stable over time, but there is some evidence that the positive relationship between inequality in the top half of the income distribution and growth is waning. This portion of the analysis highlights how our understanding of the relationship can vary depending on the concept of income inequality. And while some portions of these patterns are robust to the inclusion of county-level fixed effects, evidence of a positive relationship between income inequality and growth is not.

The income inequality and economic growth relationship varies across geographies and according to where inequality is in the income distribution. Figure 7 presents the beta

coefficients for the low and high end of the income ratios in population-weighted (left side) and unweighted specifications (right side). In both weighted and unweighted specifications, inequality in the lower half of the income distribution has no statistical relationship with growth in rural and micropolitan counties and a positive relationship (0.034; 0.017) in metropolitan counties. But inequality in the top half of the income distribution exhibits a negative relationship in rural (-0.069) and micropolitan counties (-0.073) and a positive relationship in metropolitan counties (0.029). However, in unweighted specifications, the positive relationship found in metropolitan counties turns negative (-0.044), suggesting that the relationship varies within metropolitan counties.

Figure 7: Low- and High-End Income Ratio Beta Coefficients



Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

Separately examining central and outlying metropolitan counties reveals that the relationship between income inequality and economic growth varies within metropolitan

counties. Table 10 presents the beta coefficients for the low- and high-end income ratios in weighted and unweighted specifications. Outlying metropolitan counties are similar to rural and micropolitan counties in that low-end inequality has no statistical relationship with growth, while high-end inequality has a negative relationship in both weighted (-0.066) and unweighted specifications (-0.086). In central metropolitan counties, both low-end and high-end inequality have a positive relationship with growth (0.034 and 0.035), yet only low-end inequality remains statistically significant (0.026) in unweighted specifications. This consistency provides some degree of confidence in the positive relationship between low-end inequality and growth while indicating that the relationship between high-end inequality and growth still varies within central metropolitan counties.

Table 10: Low- and High-End Income Ratio Beta Coefficients, Central and Outlying Metropolitan Counties

Metro Counties: Central Vs Outlying Counties

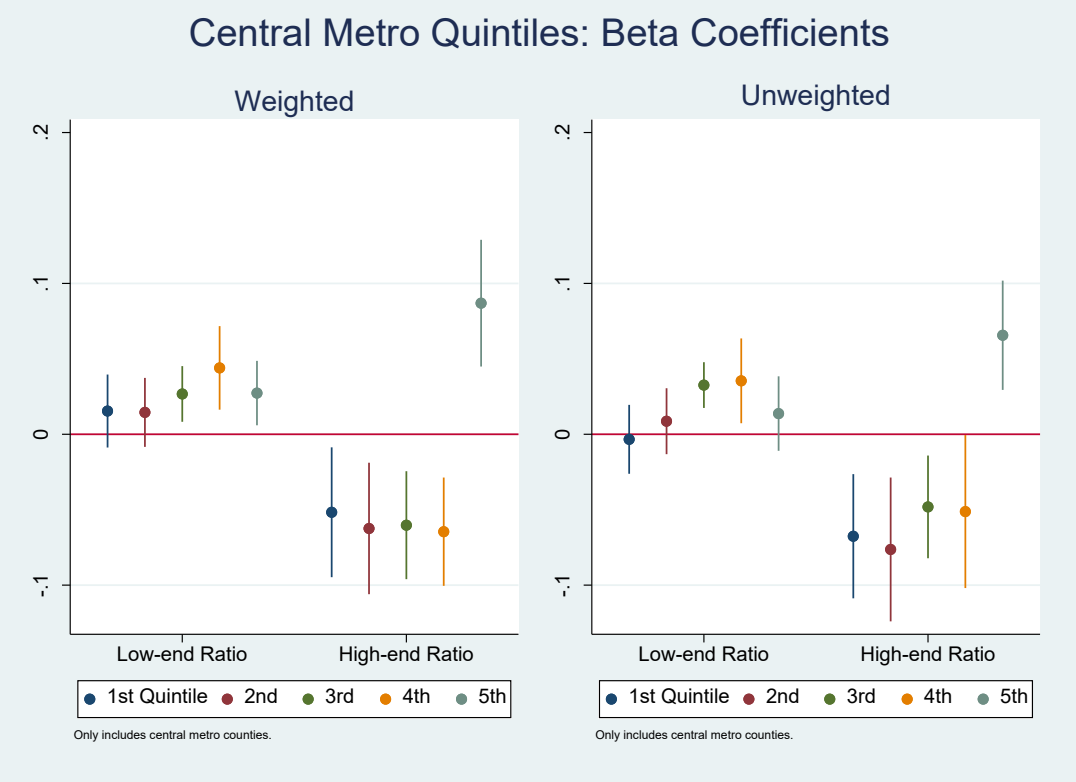
	Central	Central-UNWGHT	Outlying	Outlying-UNWGHT
Low-end Ratio	0.034***	0.026***	0.016	0.001
	(0.000)	(0.000)	(0.126)	(0.898)
High-end Ratio	0.035**	-0.006	-0.066***	-0.086***
	(0.035)	(0.637)	(0.000)	(0.000)
Observations	2168	2168	1308	1308
R-squared	0.760	0.792	0.809	0.783

p-values in parentheses
Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.
* p<0.1, ** p<0.05, *** p<0.01

Dividing central metropolitan counties into quintiles based on the population density in 2010 illustrates how the relationship varies within central metropolitan counties. Figure 8 displays the low- and high-end income inequality beta coefficients for the least population dense to the most population dense central metropolitan counties in the United States. Focusing first on low-end inequality, the positive relationship found above is driven by central metropolitan counties with higher population densities; the third (0.027), fourth (0.044), and fifth quintiles

(0.028) are statistically significant in weighted specifications, while only the third (0.033) and fourth quintiles (0.035) are statistically significant when unweighted. This figure also shows that for top-end inequality, a positive relationship with growth is only observed in the densest central metropolitan counties, while less population dense central counties exhibit a negative relationship. A statistically significant positive relationship is observed in the densest central metropolitan counties in both weighted (0.087) and unweighted specifications (0.066), while less population dense counties exhibit a statistically significant negative relationship. Again, the point estimates for high-end inequality in the densest central metropolitan counties is three to four times the size of all metropolitan county estimates (0.029).

Figure 8: Low- and High-End Income Ratio Beta Coefficients, Central Metropolitan Quintiles



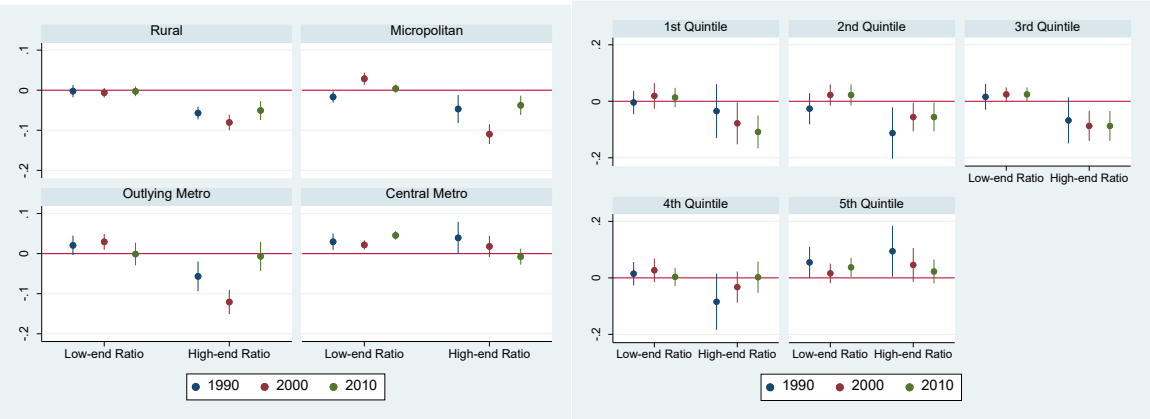
Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

These patterns are largely stable from decade to decade with some exceptions. Figure 9 presents the beta coefficients for each geography in the 1990s, 2000s, and 2010s. Starting on the left side with rural counties, low-end income inequality has no statistical relationship with growth, while top-end inequality has a negative relationship in each decade. In micropolitan counties, the relationships vary somewhat over time,but are consistent with overall patterns of no statistical relationship in the low end and a negative relationship with high-end inequality. Low-end inequality was negative in the 1990s (-0.017), positive in the 2000s (0.029), and had no statistical relationship in the 2010s, while high-end inequality has a negative relationship with growth in each decade, but the point estimates do bounce around a little bit from the 1990s (-0.047), to the 2000s (-0.110), and to the 2010s (-0.038). Moving on to outlying metropolitan counties, the patterns are generally similar with a few exceptions. Low-end inequality has no statistical relationship in the 1990s and 2010s but a positive one in the 2000s (0.029), and high-end inequality was negative in the 1990s (-0.057) and 2000s (-0.121) but has no statistical relationship in the 2010s. Looking at all central metropolitan counties, a positive relationship between low-end inequality and growth is stable and consistent with the previous patterns. However, there is no statistically significant relationship between high-end inequality and growth in central metropolitan counties when looking at each decade.

Moving on to disaggregated central metropolitan counties on the right side of Figure 9, the patterns observed over time are mostly similar to those when all years are pooled together. Starting with the least population dense counties, the pattern of no statistical relationship for low-end inequality and a negative relationship for high-end inequality generally holds for the first and second quintiles. The third quintile is also similar to the previously observed pattern of low-end inequality having a positive relationship and high-end inequality having a negative relationship.

In the fourth quintile, a completely different pattern emerges when looking at each decade. The previous patterns showed that low-end inequality has a positive relationship with growth, while high-end inequality has a negative relationship. Breaking out each decade shows that there is no statistical relationship found in any decade for both low- and high-end inequality. And for the densest central metropolitan counties, a somewhat similar pattern is found. In the 1990s, both have a positive relationship (low end: 0.055; high-end: 0.094), whereas both have no statistical relationship during the 2000s and only low-end inequality is positive (0.037) in the 2010s. The lack of a statistical relationship for high-end inequality in the densest central metropolitan counties during the 2000s and 2010s suggests that growth may only benefit from inequality at the bottom half of the income distribution and highlights how different concepts of income inequality can lead to different conclusions about the relationship between income inequality and growth.

Figure 9: Low- and High-End Income Ratio Beta Coefficients, All Geographies, Over Time

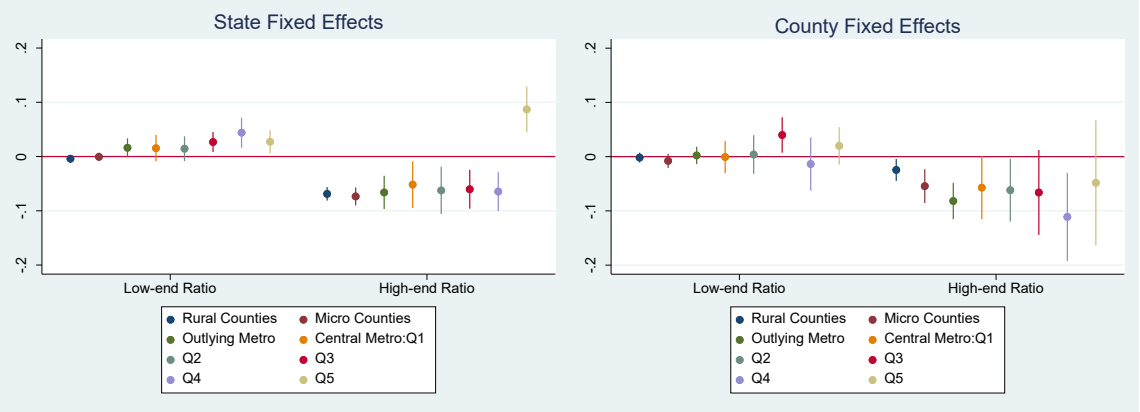


Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

Some portions of the previously observed patterns hold up to the inclusion of county fixed effects. Figure 10 presents the beta coefficients for low- and high-end inequality when using state fixed effects (left side) and county fixed effects (right side). Rural and micropolitan

counties continue to see no statistical relationship between low-end inequality and growth, while the positive relationship between low-end inequality and growth is limited to the third quintile of central metropolitan counties in county fixed-effects specifications. And evidence continues to point to high-end inequality having a negative relationship with growth, specifically in rural, micropolitan, and outlying metropolitan counties and the fourth quintile of central metropolitan counties. However, the positive relationship for high-end inequality in the state fixed-effects model does not hold up county fixed effects are included.

Figure 10: Low- and High-End Income Ratio Beta Coefficients, All Geographies, State and County Fixed Effects



Source: Census Bureau. Bar lengths represent the 90 percent confidence intervals for each point estimate.

Exploring how the income inequality and economic growth relationship varies by geography and where inequality is in the income distribution shows additional nuances. In rural, micropolitan, and outlying metropolitan counties, inequality in the bottom half of the income distribution has no statistical relationship with growth, while inequality in the top half of the income distribution exhibits a negative relationship. Within central metropolitan counties, low-end inequality has a positive relationship with growth and high-end inequality has a negative relationship, except for the most population dense central metro counties, which show a positive relationship in both measures. Again, these are economically meaningful relationships. A one

standard deviation change in high-end inequality equates to 11.8 and 11.1 percent less growth in rural and micropolitan counties, respectively, and 16.3 percent more growth in the densest central metropolitan counties. And a one standard deviation increase in low-end inequality brings an additional 7.3 percent of growth in the densest central metropolitan counties. These patterns are somewhat stable over time; however, the positive relationship between high-end inequality and growth found in the densest central counties may only apply to the 1990s, as it was found to be insignificant in the latter two decades. And while some portions of these patterns are robust to the inclusion of county-level fixed effects, evidence of a positive relationship between income inequality and growth is not.

DISCUSSION

Collectively, these findings further illustrate that although place is an important aspect in understanding the relationship between income inequality and economic growth, there are opportunities for future research on the topic. The results of this analysis are consistent with the mixed evidence as to the nature of the relationship between income inequality and economic growth found in the literature. However, this analysis demonstrates that the conflicting evidence on the nature of the relationship can be explained by a few key factors. First, there is further evidence that place is an important factor in determining whether income inequality has a negative, positive, or no relationship with subsequent economic growth. Previous evidence indicated that the higher levels of income inequality were associated with higher rates of growth in metropolitan counties and lower rates of growth in nonmetropolitan areas (Fallah and Partridge, 2007). However, this relationship is found to be more complex than just distinguishing between metropolitan and nonmetropolitan counties, since a positive relationship is only observed in the densest central metropolitan counties. Not only does this leave out many less

dense central metropolitan counties as well as outlying metropolitan counties, but the relationship in these locations is negative or statistically insignificant. This pattern is also relatively stable over time, indicating that it is robust to changing economic conditions.

The second key factor to clarifying the nature of the relationship between income inequality and economic growth is the concept of income inequality. This analysis shows that different concepts translate to different relationships. Inequality in the lower half of the income distribution is generally found to have a positive or no relationship with economic growth, while inequality in the top half of the income distribution has a negative relationship with growth in most locations outside of the densest central metropolitan counties. The lack of specificity or looseness of concepts related to inequality introduces confusion, as inequality can be conceptualized in a variety of ways. Future research ought to explore how alternative concepts and dimensions of inequality (gender, race, and opportunity) may alter the relationship. Similarly, alternative sources of income data, for example, IRS tax return data, should also be incorporated into future research for comparison purposes. This analysis also demonstrates that this regression framework can be used to explore how different concepts of income inequality are related to economic growth and to make apples-to-apples comparisons, in terms of growth, across concepts of income inequality.

Methods are the third key factor to clarifying the nature of the relationship between income inequality and economic growth. Baseline cross-sectional models used to describe how the relationship varies across place are sensitive to the inclusion of county fixed effects. Evidence of a positive relationship between inequality and growth is lacking, while some evidence of a negative relationship remains in models with county fixed effects. Although there are reasons to favor the cross-sectional results over those produced when county fixed effects are

incorporated, a general awareness of these tendencies is consistent with previous observations that methodological approaches affect the inequality and growth relationship (Partridge, 1997; Dev Bhatta, 2001; Panizza, 2002; Partridge, 2005).

In terms of theory, this analysis provides insights as to the mechanisms of the inequality-growth relationship. First, the observed positive relationship suggests that one of the mechanisms at work is that income inequality promotes economic growth because it provides market incentives to support the specialization of labor for innovation and entrepreneurship (Siebert, 1998; Edin and Topel, 1997). Second, the mechanisms for a negative relationship could be rooted in an inability to access credit markets outside of dense central metropolitan counties (Banerjee and Newman 1991; Aghion and Bolton 1992). In regard to the theoretical ASA curve, this analysis indicates that the curve is further to the right on the agglomeration-social anonymity scale than previously thought, which has implications for the mechanisms linking income inequality to growth. Fallah and Partridge (2007) posited a negative relationship in nonmetropolitan counties because growth relies on social connections and cohesion, such that higher levels of inequality are thought to reduce social cohesion and growth. However, the evidence of a negative relationship found in most locations indicates that social cohesion might be less of a factor than previously thought and that the degree of agglomeration is more likely the mechanism at work. In some sense, the positive relationship found in the densest central metropolitan counties could be considered an additional benefit to agglomeration, such that income inequality, especially in the top half of the income distribution, has a negative impact on growth up until a local economy reaches a certain level of agglomeration.

In addition to aligning with important determinants of innovation and economic growth, the connection to the level of agglomeration also opens the door to two potential ways for how

the industrial composition of a location could factor into the relationship between income inequality and economic growth. First, the linkages between industrial diversity and resilience to economic shocks suggest that growth rates may be higher in places with greater income inequality and industrial diversity. For example, larger agglomeration economies or central metropolitan counties are likely to have greater diversity in terms of industries than rural or micropolitan counties. And it is this diversity of industries that make these locations unequal in terms of income, yet more resilient to economic shocks while also supporting growth. Second, would clusters or concentrations of specific industries alter the relationship? While not shown in the findings section, some preliminary evidence indicates that the concentration of certain industries in a central metropolitan county could alter the relationship. Dividing central metropolitan counties into quintiles based on the share of employment in professional and business services reveals a pattern similar to the one observed above. A negative relationship exists for central city metropolitan counties that have low shares of employment in professional and business services and a positive relationship in those with high shares of professional and business services employment (quintile beta coefficients for income Gini coefficients: 1st: -0.669; 2nd: -0.338; 3rd: -0.404; 4th: 0.596; 5th: 1.239). A similar exercise using the share of manufacturing employment reveals that central metropolitan counties with low shares of manufacturing employment tend to have a positive relationship (quintile beta coefficients for income Gini coefficients: 1st: 1.53; 2nd: 0.612; 3rd: 0.130; 4th: -0.307; 5th: -0.367). Future research ought to further explore how the industrial composition of a location factors into the relationship between income inequality and growth.

These implications and results are based on the standard model in the income inequality and economic growth literature, but there are potential improvements that could affect the results

of this analysis. First, the association with agglomeration suggests that knowledge spillovers and innovation could play a role in the income inequality-growth relationship. Incorporating measures of technological production or innovation as additional independent variables ought to improve the model's ability to accurately estimate per capita income growth (Bauer et al., 2012). Second, the role of industry has been elevated and suggests incorporating more sophisticated methods to account for the industrial structure of a location and the demand for labor. Bartik demand shocks allow one to account for the impact of business cycle fluctuations on local employment and specific industry-wide shocks that are differentially experienced depending on the local industrial composition (Bartik, 1993; Blanchard and Katz, 1992). Third, an alternative form of the dependent variable of economic growth may affect these results. Consistent with previous work on the topic, this analysis has relied on the percentage change in per capita income over a 10-year period as a measure of economic growth. Exploring alternative definitions of economic growth (median household income) or different measures (log difference) over different lengths of time may uncover different patterns in the relationship. And lastly, as mentioned above, alternative sources for income data, such as IRS tax return data, ought to also be explored to see how they may affect these results.

In terms of policy, the notion that place matters for the relationship between income inequality and economic growth can guide how one might think about the tradeoffs between the two. In population dense central metropolitan counties, higher levels of income inequality may be more tolerable or justifiable, knowing it can potentially lead to higher rates of economic growth. A recognition of the potential benefits of income inequality in a positive manner implies that in the face of increasing income inequality, public policy in central metropolitan counties may want to focus on addressing the externalities of increasing income inequality (affordable

housing, access to education and opportunities) rather than on income inequality itself. In rural, micropolitan, outlying metropolitan, and less dense central metropolitan counties there are incentives, in terms of higher rates of economic growth, to lower income inequality.

Lastly, using what we know about recent trends in income inequality, this analysis can inform expectations for economic growth during the 2020s. During the 2010s, the level of income inequality as measured by the income Gini coefficient for all counties continued to increase (2.9 percent), with the largest increases in outlying central metropolitan (3.6 percent), rural (3.2 percent), and micropolitan counties (3.2 percent). Given the continued increases in income inequality during the 2010s, one could expect to see lower growth rates for the 2020s, on average, in rural (-1.3 ppts), micropolitan (-1.3 ppts), outlying metropolitan (-1.1 ppts), and less dense central metropolitan counties (-1.0 ppt), while the densest central metropolitan counties could expect higher rates of growth (2.1 ppts). Of course, these broad estimates are certainly subject to any changes in the level of income inequality due to the COVID-19 pandemic.

CONCLUSION

The relationship between income inequality and economic growth depends on location. This analysis incorporated a broader classification of counties, additional years of data, alternative income inequality metrics, and county fixed effects to better assess the relationship between income inequality and economic growth across US counties. While there is some previous evidence that this relationship varies across different geographic locations, this analysis finds that only the densest central metropolitan counties exhibit a positive relationship, whereas all other locations tend to have a negative or no statistical relationship. More simply, income inequality tends to be beneficial for growth in dense central metropolitan counties and a drag on growth in other locations. This pattern indicates that the ASA curve is further to the right on the

agglomeration-social anonymity scale than originally thought, implying that the mechanisms for linking income inequality to economic growth are more likely associated with agglomeration than with social cohesion. The results of this analysis also align with the viewpoint that says income inequality, especially in the top half of the income distribution, promotes economic growth because it provides market incentives to support the specialization of labor for innovation and entrepreneurship by rewarding risk-taking. On the other hand, this analysis also observed a negative relationship in a vast majority of counties, a finding that aligns with the perspective that income inequality could be limiting growth by preventing one's ability to access credit markets.

These implications and results are based on the standard model in the income inequality and economic growth literature and the notion that counties are the appropriate level of geography for studying this relationship. However, potential methodological improvements may alter these conclusions. A research agenda focused on updating the standard model to better reflect the role of innovation in regional growth along with some more sophisticated methods to account for the local industrial structure and demand for labor would improve the model's ability to accurately assess the relationship between income inequality and economic growth. This analysis also demonstrated that the relationship is sensitive to different concepts of income inequality. Future research on the topic should incorporate alternative concepts and dimensions of income inequality (race, gender, and opportunity) as well as income data from tax returns. With additional improvements, this regression framework can be a useful way to study how sensitive the relationship is to different sources, measures, and concepts of income inequality.

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APPENDIX

Regression Tables

Table 11: Income Gini Coefficient: Rural, Micropolitan and Metropolitan Counties

Table: Growth Regressions by Geography

	Rural		Micro		Metro	
Gini	-0.902***	(0.000)	-0.902***	(0.000)	0.622***	(0.002)
Log Income per capita	-0.617***	(0.000)	-0.442***	(0.000)	-0.289***	(0.000)
Log(Income per capita) spatial lag	0.078	(0.223)	-0.060	(0.106)	-0.014	(0.589)
% with high school diploma	-0.014	(0.837)	-0.072	(0.384)	0.351***	(0.004)
% with some college	-0.117	(0.330)	-0.040	(0.710)	-0.006	(0.966)
% with Bachelor's degree	1.132***	(0.000)	0.893***	(0.000)	0.581***	(0.000)
% with Graduate degree	0.379	(0.130)	0.450**	(0.021)	0.619***	(0.003)
Amenity value	0.002	(0.623)	0.007**	(0.031)	0.015***	(0.000)
Log Population	-0.001	(0.865)	-0.001	(0.902)	-0.020***	(0.000)
% Asian	-1.301*	(0.065)	0.034	(0.932)	0.465***	(0.001)
% Black	-0.136*	(0.067)	0.009	(0.919)	0.058	(0.495)
% Native American	-0.328***	(0.000)	-0.090	(0.275)	0.088	(0.395)
% White	-0.120	(0.108)	0.061	(0.489)	0.126	(0.198)
% Hispanic	-0.021	(0.181)	-0.015	(0.418)	-0.024	(0.166)
Age 16-24	-0.109	(0.581)	-0.424***	(0.008)	-0.626***	(0.005)
Age 25-34	-1.154***	(0.001)	-1.125***	(0.000)	-0.148	(0.595)
Age 35-44	0.648	(0.117)	0.406	(0.192)	2.088***	(0.000)
Age 45-54	1.283***	(0.000)	1.004***	(0.002)	-1.401***	(0.007)
Age 55-64	-0.218	(0.534)	-0.639**	(0.034)	0.609	(0.188)
Age 65+	0.367	(0.115)	0.038	(0.834)	-0.163	(0.412)
% Agriculture & Mining	-0.737***	(0.008)	-0.172	(0.706)	-1.230	(0.119)
% Construction	-0.377	(0.178)	0.360	(0.446)	-1.003	(0.234)
% Manufacturing	-0.636**	(0.018)	-0.149	(0.746)	-1.164	(0.163)
% Transportation	-0.821**	(0.011)	-0.009	(0.986)	-0.882	(0.310)
% Trade	-0.620**	(0.025)	-0.059	(0.900)	-1.095	(0.142)
% FIRE	-0.070	(0.803)	0.201	(0.690)	-1.419	(0.131)
% Professional & Business services	-0.032	(0.923)	0.246	(0.620)	-0.867	(0.359)
% Arts, Accommodation & Food services	-0.682**	(0.015)	0.106	(0.825)	-1.043	(0.224)
% Education and Health services	-0.884***	(0.001)	-0.118	(0.799)	-1.024	(0.211)
% Other services	-0.632**	(0.032)	-0.359	(0.446)	-1.163	(0.109)
% Public Administration	-0.911***	(0.006)	-0.101	(0.827)	-1.065	(0.187)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.153***	(0.000)	-0.183***	(0.000)	-0.185***	(0.000)
year=2010	-0.076	(0.125)	-0.071*	(0.073)	-0.060	(0.206)
Observations	3933		1909		3476	
R-squared	0.748		0.801		0.748	

p-values in parentheses
Sample all years pooled; Models include state and year fixed effects and geographically clustered standard errors.
* p<0.1, ** p<0.05, *** p<0.01

Table 12: Income Gini Coefficient: Central and Outlying Metropolitan Counties

Metro Counties: Central Vs Outlying Counties, Weighted Vs Unweighted

	Central		Central~T		Outlying		Outlyin~T	
Gini	0.726***	(0.001)	0.121	(0.429)	-0.685***	(0.001)	-1.067***	(0.000)
Log Income per capita	-0.277***	(0.000)	-0.313***	(0.000)	-0.374***	(0.000)	-0.454***	(0.000)
Log(Income per capita) spatial lag	-0.014	(0.586)	-0.016	(0.559)	-0.215***	(0.003)	-0.144**	(0.048)
% with high school diploma	0.453***	(0.001)	0.309**	(0.011)	-0.262**	(0.035)	-0.238*	(0.062)
% with some college	0.033	(0.827)	-0.048	(0.753)	-0.106	(0.585)	-0.058	(0.727)
% with Bachelor's degree	0.619***	(0.000)	0.475***	(0.004)	0.116	(0.675)	0.397	(0.158)
% with Graduate degree	0.586***	(0.006)	0.889***	(0.000)	1.332***	(0.001)	1.357***	(0.000)
Amenity value	0.015***	(0.000)	0.011***	(0.000)	0.002	(0.665)	0.003	(0.537)
Log Population	-0.020***	(0.000)	-0.015***	(0.000)	-0.008	(0.241)	-0.018***	(0.002)
% Asian	0.463***	(0.001)	0.353*	(0.096)	0.525	(0.453)	-0.657	(0.192)
% Black	0.056	(0.543)	0.034	(0.635)	-0.118	(0.486)	-0.279*	(0.080)
% Native American	0.152	(0.157)	0.043	(0.619)	-0.561**	(0.037)	-0.533***	(0.003)
% White	0.132	(0.220)	0.061	(0.375)	-0.163	(0.328)	-0.345**	(0.031)
% Hispanic	-0.021	(0.289)	-0.019	(0.258)	-0.065	(0.280)	-0.085	(0.115)
Age 16-24	-0.614***	(0.010)	-0.385***	(0.001)	-0.888***	(0.000)	-0.506***	(0.005)
Age 25-34	-0.021	(0.939)	-0.291	(0.111)	-1.907***	(0.000)	-1.382***	(0.007)
Age 35-44	2.365***	(0.000)	1.437***	(0.000)	0.279	(0.557)	0.707	(0.150)
Age 45-54	-1.753***	(0.002)	-0.258	(0.489)	-0.247	(0.664)	0.656	(0.173)
Age 55-64	1.116**	(0.034)	-0.259	(0.559)	-0.555	(0.316)	-1.178**	(0.024)
Age 65+	-0.290	(0.185)	0.041	(0.776)	-0.413	(0.206)	0.295	(0.341)
% Agriculture & Mining	-1.056	(0.170)	0.079	(0.881)	-0.153	(0.890)	-0.213	(0.703)
% Construction	-0.854	(0.309)	0.474	(0.406)	0.122	(0.910)	0.141	(0.804)
% Manufacturing	-0.967	(0.244)	-0.133	(0.805)	-0.109	(0.918)	-0.100	(0.853)
% Transportation	-0.704	(0.412)	0.136	(0.803)	0.541	(0.619)	0.189	(0.734)
% Trade	-0.788	(0.285)	-0.198	(0.714)	0.114	(0.918)	-0.074	(0.898)
% FIRE	-1.297	(0.166)	0.190	(0.748)	0.550	(0.620)	0.908	(0.151)
% Professional & Business services	-0.644	(0.496)	0.301	(0.631)	0.292	(0.802)	0.543	(0.353)
% Arts, Accommodation & Food services	-0.869	(0.313)	0.269	(0.643)	-0.200	(0.847)	0.104	(0.849)
% Education and Health services	-0.762	(0.350)	-0.138	(0.805)	-0.209	(0.838)	-0.324	(0.546)
% Other services	-0.788	(0.277)	-0.335	(0.572)	-0.208	(0.847)	0.159	(0.803)
% Public Administration	-0.805	(0.316)	-0.101	(0.856)	-0.180	(0.861)	-0.361	(0.484)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.158***	(0.000)	-0.222***	(0.000)	-0.122***	(0.006)	-0.152***	(0.000)
year=2010	-0.040	(0.454)	-0.116***	(0.000)	0.026	(0.669)	-0.007	(0.901)
Observations	2168		2168		1308		1308	
R-squared	0.753		0.789		0.808		0.783	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 13: Income Gini Coefficient: Central Metropolitan Counties

Table: Growth Regressions: Metro Central Counties by Population Density Quartile Weighted

	1st		2nd		3rd		4th		5th	
Gini	-0.491*	(0.081)	-0.795**	(0.010)	-0.395	(0.130)	-0.452*	(0.082)	1.487***	(0.000)
Log Income per capita	-0.516***	(0.000)	-0.223***	(0.003)	-0.373***	(0.000)	-0.246***	(0.003)	-0.255***	(0.007)
Log(Income per capita) spati~l	-0.099	(0.224)	-0.165**	(0.036)	-0.193*	(0.080)	-0.203***	(0.006)	-0.013	(0.566)
% with high school diploma	0.426*	(0.076)	-0.353	(0.127)	0.063	(0.788)	0.256	(0.356)	1.006***	(0.001)
% with some college	-0.097	(0.732)	-0.491*	(0.060)	-0.384	(0.129)	-0.034	(0.881)	0.161	(0.676)
% with Bachelor's degree	0.974***	(0.009)	0.330	(0.293)	0.766**	(0.010)	0.275	(0.351)	0.689*	(0.074)
% with Graduate degree	0.968*	(0.080)	0.245	(0.550)	0.910**	(0.025)	1.233**	(0.017)	0.494	(0.380)
Amenity value	0.000	(0.992)	-0.002	(0.757)	0.029***	(0.001)	0.010*	(0.093)	0.018*	(0.051)
Log Population	-0.021***	(0.004)	-0.043***	(0.002)	-0.039***	(0.007)	-0.017*	(0.051)	-0.019**	(0.050)
% Asian	0.370	(0.599)	-1.561**	(0.040)	-0.172	(0.787)	0.140	(0.607)	0.997***	(0.001)
% Black	-0.109	(0.462)	-0.156	(0.534)	-0.302	(0.165)	-0.154	(0.431)	0.259	(0.155)
% Native American	-0.033	(0.855)	0.272	(0.754)	0.784	(0.684)	1.070	(0.402)	-1.030	(0.700)
% White	-0.032	(0.822)	-0.143	(0.549)	-0.289	(0.237)	-0.262	(0.206)	0.490**	(0.022)
% Hispanic	-0.056	(0.102)	0.142***	(0.004)	-0.047	(0.351)	0.005	(0.881)	-0.002	(0.971)
Age 16-24	-0.236	(0.454)	-0.445	(0.209)	-0.251	(0.493)	-0.726**	(0.033)	-1.492***	(0.003)
Age 25-34	-1.580**	(0.019)	-1.898***	(0.001)	-1.199***	(0.007)	-0.236	(0.578)	0.451	(0.338)
Age 35-44	2.297***	(0.001)	0.441	(0.516)	1.131	(0.162)	1.804***	(0.006)	1.556	(0.109)
Age 45-54	-0.538	(0.395)	-0.764	(0.296)	0.441	(0.420)	0.025	(0.971)	-3.275**	(0.016)
Age 55-64	0.430	(0.541)	-0.877	(0.243)	-0.153	(0.877)	0.443	(0.577)	2.317	(0.120)
Age 65+	-0.342	(0.436)	-0.158	(0.765)	-0.232	(0.549)	0.277	(0.374)	-1.441**	(0.014)
% Agriculture & Mining	-1.193	(0.144)	-1.026	(0.219)	0.404	(0.668)	-0.204	(0.838)	-0.832	(0.471)
% Construction	-1.278	(0.198)	-0.445	(0.613)	1.524*	(0.066)	0.761	(0.385)	-2.106*	(0.080)
% Manufacturing	-1.410*	(0.084)	-0.772	(0.349)	1.108	(0.144)	0.281	(0.738)	-1.133	(0.237)
% Transportation	-1.576*	(0.070)	-0.410	(0.655)	1.434*	(0.063)	0.415	(0.632)	-1.119	(0.291)
% Trade	-1.476*	(0.072)	-0.555	(0.504)	1.343*	(0.098)	0.590	(0.495)	-0.717	(0.458)
% FIRE	-0.480	(0.616)	-0.622	(0.484)	0.699	(0.439)	0.086	(0.926)	-1.925*	(0.055)
% Professional & Business se~c	-1.036	(0.233)	-0.154	(0.860)	1.665*	(0.067)	0.745	(0.491)	-1.276	(0.257)
% Arts, Accommodation & Food~r	-0.886	(0.317)	0.310	(0.724)	1.512*	(0.056)	0.436	(0.622)	-1.545*	(0.087)
% Education and Health servi~s	-1.312	(0.127)	-0.492	(0.550)	0.799	(0.305)	0.530	(0.561)	-0.680	(0.465)
% Other services	-1.121	(0.185)	-0.311	(0.771)	1.549*	(0.080)	0.660	(0.450)	-0.151	(0.899)
% Public Administration	-1.649*	(0.053)	-0.527	(0.524)	1.191	(0.119)	0.102	(0.909)	-0.633	(0.517)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.114**	(0.044)	-0.215***	(0.001)	-0.105*	(0.092)	-0.151***	(0.003)	-0.028	(0.810)
year=2010	0.050	(0.527)	-0.134*	(0.100)	0.019	(0.829)	-0.026	(0.692)	0.088	(0.520)
Observations	435		432		435		438		426	
R-squared	0.801		0.834		0.858		0.869		0.755	

p-values in parentheses

Sample all years pooled; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 14: Income Gini Coefficient: Rural Counties Over Time

Rural Counties Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.902***	(0.000)	-0.807***	(0.000)	-0.694***	(0.004)	-0.616***	(0.001)
Log Income per capita	-0.617***	(0.000)	-0.804***	(0.000)	-0.650***	(0.000)	-0.561***	(0.000)
Log(Income per capita) spatial lag	0.078	(0.223)	0.138	(0.194)	0.228**	(0.043)	0.363***	(0.000)
% with high school diploma	-0.014	(0.837)	0.165	(0.205)	0.214*	(0.056)	0.061	(0.611)
% with some college	-0.117	(0.330)	0.197	(0.212)	-0.146	(0.547)	0.167	(0.346)
% with Bachelor's degree	1.132***	(0.000)	0.689***	(0.001)	1.429***	(0.000)	0.462**	(0.021)
% with Graduate degree	0.379	(0.130)	1.604***	(0.000)	0.067	(0.920)	0.442	(0.101)
Amenity value	0.002	(0.623)	-0.001	(0.900)	-0.005	(0.407)	0.005	(0.396)
Log Population	-0.001	(0.865)	-0.003	(0.767)	0.006	(0.636)	-0.004	(0.551)
% Asian	-1.301*	(0.065)	-3.992**	(0.011)	-0.112	(0.954)	1.342	(0.160)
% Black	-0.136*	(0.067)	-0.224**	(0.025)	0.165	(0.369)	0.090	(0.533)
% Native American	-0.328***	(0.000)	-0.664***	(0.000)	0.207	(0.265)	-0.288*	(0.084)
% White	-0.120	(0.108)	-0.223***	(0.006)	0.240	(0.199)	0.128	(0.353)
% Hispanic	-0.021	(0.181)	-0.137**	(0.022)	0.037	(0.359)	-0.031	(0.266)
Age 16-24	-0.109	(0.581)	0.292	(0.392)	-0.324	(0.459)	-0.577**	(0.029)
Age 25-34	-1.154***	(0.001)	0.376	(0.525)	-2.191***	(0.000)	-0.350	(0.490)
Age 35-44	0.648	(0.117)	1.742***	(0.000)	1.859**	(0.012)	-0.137	(0.693)
Age 45-54	1.283***	(0.000)	-0.190	(0.698)	0.806	(0.378)	-0.277	(0.428)
Age 55-64	-0.218	(0.534)	1.977***	(0.000)	-0.018	(0.974)	-0.545	(0.177)
Age 65+	0.367	(0.115)	0.530	(0.194)	0.008	(0.980)	0.063	(0.800)
% Agriculture & Mining	-0.737***	(0.008)	-0.043	(0.893)	-0.465	(0.309)	-0.356	(0.254)
% Construction	-0.377	(0.178)	0.738*	(0.088)	-0.639	(0.152)	-0.055	(0.872)
% Manufacturing	-0.636**	(0.018)	0.269	(0.451)	-1.042**	(0.035)	-0.272	(0.372)
% Transportation	-0.821**	(0.011)	-0.038	(0.927)	-1.138	(0.132)	-0.356	(0.324)
% Trade	-0.620**	(0.025)	0.068	(0.863)	-0.789*	(0.087)	-0.119	(0.699)
% FIRE	-0.070	(0.803)	1.114*	(0.067)	-1.491*	(0.085)	-0.133	(0.759)
% Professional & Business services	-0.032	(0.923)	0.978**	(0.033)	-0.496	(0.542)	-0.357	(0.286)
% Arts, Accommodation & Food services	-0.682**	(0.015)	1.336	(0.151)	-0.622	(0.166)	-0.352	(0.349)
% Education and Health services	-0.884***	(0.001)	-0.096	(0.849)	-1.250***	(0.008)	-0.467	(0.102)
% Other services	-0.632**	(0.032)	-0.189	(0.741)	-0.105	(0.859)	0.470	(0.370)
% Public Administration	-0.911***	(0.006)	0.000	(.)	-1.261**	(0.039)	-0.834**	(0.012)
year=1990	0.000	(.)						
year=2000	-0.153***	(0.000)						
year=2010	-0.076	(0.125)						
Observations	3933		1312		1311		1310	
R-squared	0.748		0.488		0.466		0.385	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 15: Income Gini Coefficient: Micropolitan Counties Overtime

Micropolitan Counties Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.902***	(0.000)	-0.348	(0.193)	-1.153***	(0.000)	-0.702***	(0.000)
Log Income per capita	-0.442***	(0.000)	-0.610***	(0.000)	-0.439***	(0.000)	-0.352***	(0.000)
Log(Income per capita) spatial lag	-0.060	(0.106)	0.019	(0.736)	0.102	(0.352)	0.011	(0.863)
% with high school diploma	-0.072	(0.384)	0.433***	(0.004)	0.100	(0.538)	0.019	(0.913)
% with some college	-0.040	(0.710)	0.398*	(0.083)	0.096	(0.575)	-0.208	(0.315)
% with Bachelor's degree	0.893***	(0.000)	1.093***	(0.000)	1.190***	(0.000)	0.595***	(0.002)
% with Graduate degree	0.450**	(0.021)	0.194	(0.718)	0.058	(0.872)	0.610*	(0.083)
Amenity value	0.007**	(0.031)	0.007	(0.298)	0.002	(0.769)	0.006	(0.353)
Log Population	-0.001	(0.902)	-0.019*	(0.050)	0.006	(0.585)	-0.005	(0.625)
% Asian	0.034	(0.932)	-0.658	(0.473)	1.697**	(0.032)	-0.838	(0.115)
% Black	0.009	(0.919)	0.172	(0.541)	0.339*	(0.098)	-0.076	(0.587)
% Native American	-0.090	(0.275)	0.033	(0.906)	0.185	(0.391)	-0.042	(0.766)
% White	0.061	(0.489)	0.128	(0.643)	0.442**	(0.025)	0.017	(0.903)
% Hispanic	-0.015	(0.418)	0.003	(0.983)	-0.038	(0.667)	-0.019	(0.521)
Age 16-24	-0.424***	(0.008)	0.437	(0.208)	-1.374***	(0.000)	-0.226	(0.355)
Age 25-34	-1.125***	(0.000)	0.686	(0.234)	-2.163***	(0.000)	-0.386	(0.364)
Age 35-44	0.406	(0.192)	2.512***	(0.000)	0.896	(0.195)	0.204	(0.726)
Age 45-54	1.004***	(0.002)	1.594**	(0.021)	-1.057*	(0.080)	-0.982	(0.118)
Age 55-64	-0.639**	(0.034)	1.094	(0.287)	0.005	(0.995)	1.049*	(0.072)
Age 65+	0.038	(0.834)	0.579	(0.162)	-0.887**	(0.012)	-0.337	(0.307)
% Agriculture & Mining	-0.172	(0.706)	0.127	(0.514)	0.716	(0.331)	0.633	(0.434)
% Construction	0.360	(0.446)	1.298***	(0.000)	0.283	(0.716)	0.674	(0.398)
% Manufacturing	-0.149	(0.746)	0.311*	(0.077)	0.278	(0.698)	0.613	(0.420)
% Transportation	-0.009	(0.986)	0.014	(0.962)	0.681	(0.352)	0.694	(0.407)
% Trade	-0.059	(0.900)	0.377*	(0.074)	0.755	(0.338)	0.641	(0.415)
% FIRE	0.201	(0.690)	0.193	(0.689)	0.607	(0.463)	0.725	(0.384)
% Professional & Business services	0.246	(0.620)	0.573	(0.136)	1.238	(0.159)	0.680	(0.405)
% Arts, Accommodation & Food services	0.106	(0.825)	1.736**	(0.024)	0.860	(0.240)	0.727	(0.352)
% Education and Health services	-0.118	(0.799)	0.304	(0.212)	0.890	(0.225)	0.409	(0.605)
% Other services	-0.359	(0.446)	0.807*	(0.075)	0.513	(0.613)	1.097	(0.215)
% Public Administration	-0.101	(0.827)	0.000	(.)	0.187	(0.801)	0.640	(0.416)
year=1990	0.000	(.)						
year=2000	-0.183***	(0.000)						
year=2010	-0.071*	(0.073)						
Observations	1909		637		636		636	
R-squared	0.801		0.568		0.556		0.366	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 16: Income Gini Coefficient: Outlying Metropolitan Counties Over Time

Outlying Metropolitan Counties Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.685***	(0.001)	-0.876***	(0.000)	-1.400***	(0.000)	-0.814***	(0.001)
Log Income per capita	-0.374***	(0.000)	-0.603***	(0.000)	-0.348***	(0.000)	-0.354***	(0.000)
Log(Income per capita) spatial lag	-0.215***	(0.003)	-0.143	(0.258)	-0.049	(0.701)	0.056	(0.601)
% with high school diploma	-0.262**	(0.035)	-0.237	(0.220)	-0.002	(0.993)	-0.334	(0.139)
% with some college	-0.106	(0.585)	-0.376	(0.161)	-0.104	(0.693)	-0.061	(0.820)
% with Bachelor's degree	0.116	(0.675)	1.016**	(0.011)	0.464	(0.297)	-0.008	(0.981)
% with Graduate degree	1.332***	(0.001)	1.312*	(0.058)	0.699	(0.273)	1.313***	(0.005)
Amenity value	0.002	(0.665)	0.021**	(0.021)	-0.002	(0.833)	0.004	(0.682)
Log Population	-0.008	(0.241)	-0.001	(0.901)	0.003	(0.753)	-0.024***	(0.010)
% Asian	0.525	(0.453)	-4.228***	(0.002)	0.388	(0.706)	-0.930	(0.130)
% Black	-0.118	(0.486)	-0.072	(0.911)	-0.211	(0.611)	-0.578*	(0.052)
% Native American	-0.561**	(0.037)	-0.584	(0.373)	-0.020	(0.966)	-0.770**	(0.011)
% White	-0.163	(0.328)	-0.238	(0.708)	-0.232	(0.561)	-0.635**	(0.031)
% Hispanic	-0.065	(0.280)	-0.248	(0.479)	-0.183	(0.384)	-0.135**	(0.030)
Age 16-24	-0.888***	(0.000)	0.368	(0.373)	-0.423	(0.211)	-0.922**	(0.012)
Age 25-34	-1.907***	(0.000)	0.429	(0.667)	-2.455***	(0.000)	-1.424**	(0.024)
Age 35-44	0.279	(0.557)	2.350**	(0.047)	0.024	(0.969)	-0.327	(0.695)
Age 45-54	-0.247	(0.664)	1.170	(0.262)	0.864	(0.237)	0.223	(0.766)
Age 55-64	-0.555	(0.316)	0.022	(0.983)	-0.434	(0.601)	-1.456*	(0.061)
Age 65+	-0.413	(0.206)	0.633	(0.307)	0.118	(0.746)	-0.247	(0.613)
% Agriculture & Mining	-0.153	(0.890)	0.385	(0.227)	0.724	(0.305)	-0.287	(0.664)
% Construction	0.122	(0.910)	0.871*	(0.051)	0.244	(0.742)	-0.136	(0.826)
% Manufacturing	-0.109	(0.918)	0.357	(0.173)	-0.090	(0.891)	-0.219	(0.708)
% Transportation	0.541	(0.619)	0.295	(0.399)	0.539	(0.441)	-0.162	(0.811)
% Trade	0.114	(0.918)	0.343	(0.292)	-0.115	(0.869)	-0.139	(0.809)
% FIRE	0.550	(0.620)	2.119***	(0.002)	0.704	(0.356)	-0.061	(0.932)
% Professional & Business services	0.292	(0.802)	1.351**	(0.018)	0.839	(0.265)	0.074	(0.915)
% Arts, Accommodation & Food services	-0.200	(0.847)	0.309	(0.814)	0.340	(0.608)	-0.189	(0.731)
% Education and Health services	-0.209	(0.838)	-0.152	(0.625)	-0.112	(0.870)	-0.458	(0.427)
% Other services	-0.208	(0.847)	0.619	(0.392)	0.767	(0.385)	0.354	(0.688)
% Public Administration	-0.180	(0.861)	0.000	(.)	-0.158	(0.800)	-0.503	(0.412)
year=1990	0.000	(.)						
year=2000	-0.122***	(0.006)						
year=2010	0.026	(0.669)						
Observations	1308		436		436		436	
R-squared	0.808		0.499		0.611		0.345	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 17: Income Gini Coefficient: First Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q1 Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.491*	(0.081)	-0.412	(0.544)	-0.758	(0.103)	-1.142***	(0.002)
Log Income per capita	-0.516***	(0.000)	-0.712***	(0.003)	-0.079	(0.712)	-0.184	(0.159)
Log(Income per capita) spatial lag	-0.099	(0.224)	0.021	(0.928)	-0.102	(0.478)	0.036	(0.620)
% with high school diploma	0.426*	(0.076)	0.812*	(0.061)	-0.037	(0.933)	-0.602	(0.171)
% with some college	-0.097	(0.732)	0.339	(0.623)	-0.018	(0.968)	-1.029**	(0.021)
% with Bachelor's degree	0.974***	(0.009)	0.833	(0.328)	0.986	(0.245)	0.316	(0.480)
% with Graduate degree	0.968*	(0.080)	2.923**	(0.026)	0.331	(0.741)	-0.393	(0.540)
Amenity value	0.000	(0.992)	-0.017	(0.275)	-0.017	(0.351)	0.005	(0.626)
Log Population	-0.021***	(0.004)	-0.037**	(0.024)	-0.004	(0.684)	-0.021**	(0.017)
% Asian	0.370	(0.599)	0.011	(0.993)	0.627	(0.596)	0.268	(0.749)
% Black	-0.109	(0.462)	0.344	(0.398)	0.417	(0.372)	-0.043	(0.826)
% Native American	-0.033	(0.855)	0.829*	(0.087)	0.188	(0.670)	-0.216	(0.385)
% White	-0.032	(0.822)	0.555	(0.121)	0.204	(0.493)	-0.034	(0.859)
% Hispanic	-0.056	(0.102)	0.202	(0.192)	-0.016	(0.932)	-0.092*	(0.072)
Age 16-24	-0.236	(0.454)	-0.034	(0.953)	-0.233	(0.759)	-0.888**	(0.040)
Age 25-34	-1.580**	(0.019)	1.877	(0.126)	-1.516	(0.119)	-0.556	(0.475)
Age 35-44	2.297***	(0.001)	3.825***	(0.004)	0.324	(0.861)	0.113	(0.923)
Age 45-54	-0.538	(0.395)	0.250	(0.912)	-0.853	(0.632)	-1.700	(0.128)
Age 55-64	0.430	(0.541)	0.354	(0.864)	2.976	(0.412)	0.504	(0.590)
Age 65+	-0.342	(0.436)	1.098	(0.173)	-1.619*	(0.053)	-0.355	(0.507)
% Agriculture & Mining	-1.193	(0.144)	0.962**	(0.030)	-0.387	(0.693)	0.987	(0.369)
% Construction	-1.278	(0.198)	0.336	(0.640)	0.454	(0.738)	1.243	(0.266)
% Manufacturing	-1.410*	(0.084)	0.032	(0.911)	-1.154	(0.263)	0.955	(0.379)
% Transportation	-1.576*	(0.070)	0.173	(0.743)	-0.501	(0.654)	0.733	(0.552)
% Trade	-1.476*	(0.072)	0.222	(0.746)	-0.861	(0.368)	0.511	(0.667)
% FIRE	-0.480	(0.616)	1.961**	(0.023)	-1.029	(0.494)	1.128	(0.335)
% Professional & Business services	-1.036	(0.233)	-0.650	(0.603)	-1.879	(0.127)	1.569	(0.183)
% Arts, Accommodation & Food services	-0.886	(0.317)	0.695	(0.678)	-1.143	(0.281)	1.972	(0.116)
% Education and Health services	-1.312	(0.127)	-0.289	(0.579)	-0.586	(0.591)	1.437	(0.205)
% Other services	-1.121	(0.185)	0.183	(0.756)	3.132**	(0.034)	1.248	(0.268)
% Public Administration	-1.649*	(0.053)	0.000	(.)	-1.037	(0.350)	0.329	(0.749)
year=1990	0.000	(.)						
year=2000	-0.114**	(0.044)						
year=2010	0.050	(0.527)						
Observations	435		145		145		145	
R-squared	0.801		0.879		0.641		0.780	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 18: Income Gini Coefficient: Second Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q2 Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.795**	(0.010)	-1.588***	(0.007)	-0.615	(0.114)	-0.615	(0.114)
Log Income per capita	-0.223***	(0.003)	-0.318**	(0.017)	-0.002	(0.983)	-0.002	(0.983)
Log(Income per capita) spatial lag	-0.165**	(0.036)	-0.157	(0.267)	-0.042	(0.691)	-0.042	(0.691)
% with high school diploma	-0.353	(0.127)	-0.002	(0.997)	-0.409	(0.345)	-0.409	(0.345)
% with some college	-0.491*	(0.060)	-0.284	(0.591)	-0.463	(0.389)	-0.463	(0.389)
% with Bachelor's degree	0.330	(0.293)	0.475	(0.430)	0.025	(0.964)	0.025	(0.964)
% with Graduate degree	0.245	(0.550)	1.427	(0.104)	-0.148	(0.776)	-0.148	(0.776)
Amenity value	-0.002	(0.757)	-0.013	(0.208)	0.006	(0.600)	0.006	(0.600)
Log Population	-0.043***	(0.002)	-0.024	(0.259)	-0.032*	(0.052)	-0.032*	(0.052)
% Asian	-1.561**	(0.040)	-2.816	(0.177)	-0.313	(0.754)	-0.313	(0.754)
% Black	-0.156	(0.534)	0.137	(0.915)	-0.133	(0.817)	-0.133	(0.817)
% Native American	0.272	(0.754)	-1.490	(0.425)	-0.002	(0.999)	-0.002	(0.999)
% White	-0.143	(0.549)	-0.279	(0.829)	-0.061	(0.918)	-0.061	(0.918)
% Hispanic	0.142***	(0.004)	-0.025	(0.973)	-0.077	(0.396)	-0.077	(0.396)
Age 16-24	-0.445	(0.209)	-0.255	(0.745)	-1.306**	(0.035)	-1.306**	(0.035)
Age 25-34	-1.898***	(0.001)	-0.317	(0.805)	-1.797*	(0.054)	-1.797*	(0.054)
Age 35-44	0.441	(0.516)	-1.310	(0.422)	-2.094	(0.216)	-2.094	(0.216)
Age 45-54	-0.764	(0.296)	2.707*	(0.071)	-2.359**	(0.033)	-2.359**	(0.033)
Age 55-64	-0.877	(0.243)	-2.164	(0.262)	-1.613	(0.120)	-1.613	(0.120)
Age 65+	-0.158	(0.765)	0.511	(0.573)	-0.766	(0.355)	-0.766	(0.355)
% Agriculture & Mining	-1.026	(0.219)	-0.102	(0.825)	-1.148	(0.396)	-1.148	(0.396)
% Construction	-0.445	(0.613)	0.932	(0.127)	-0.382	(0.796)	-0.382	(0.796)
% Manufacturing	-0.772	(0.349)	0.006	(0.987)	-1.285	(0.330)	-1.285	(0.330)
% Transportation	-0.410	(0.655)	0.120	(0.822)	-0.231	(0.880)	-0.231	(0.880)
% Trade	-0.555	(0.504)	0.192	(0.681)	-2.115	(0.122)	-2.115	(0.122)
% FIRE	-0.622	(0.484)	0.870	(0.236)	-1.154	(0.394)	-1.154	(0.394)
% Professional & Business services	-0.154	(0.860)	0.166	(0.820)	-1.660	(0.269)	-1.660	(0.269)
% Arts, Accommodation & Food services	0.310	(0.724)	2.831	(0.249)	-0.806	(0.525)	-0.806	(0.525)
% Education and Health services	-0.492	(0.550)	0.161	(0.724)	-1.102	(0.417)	-1.102	(0.417)
% Other services	-0.311	(0.771)	-0.375	(0.811)	-1.756	(0.338)	-1.756	(0.338)
% Public Administration	-0.527	(0.524)	0.000	(.)	-1.550	(0.254)	-1.550	(0.254)
year=1990	0.000	(.)						
year=2000	-0.215***	(0.001)						
year=2010	-0.134*	(0.100)						
Observations	432		144		144		144	
R-squared	0.834		0.797		0.625		0.625	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 19: Income Gini Coefficient: Third Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q3 Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.395	(0.130)	-0.210	(0.689)	-0.586	(0.155)	-0.586	(0.155)
Log Income per capita	-0.373***	(0.000)	-0.166	(0.285)	-0.211	(0.110)	-0.211	(0.110)
Log(Income per capita) spatial lag	-0.193*	(0.080)	-0.103	(0.456)	-0.228	(0.118)	-0.228	(0.118)
% with high school diploma	0.063	(0.788)	-0.551	(0.185)	0.254	(0.393)	0.254	(0.393)
% with some college	-0.384	(0.129)	-0.389	(0.406)	0.276	(0.456)	0.276	(0.456)
% with Bachelor's degree	0.766**	(0.010)	0.087	(0.876)	0.085	(0.809)	0.085	(0.809)
% with Graduate degree	0.910**	(0.025)	0.055	(0.947)	0.776	(0.124)	0.776	(0.124)
Amenity value	0.029***	(0.001)	0.004	(0.688)	0.005	(0.634)	0.005	(0.634)
Log Population	-0.039***	(0.007)	-0.037**	(0.029)	-0.022	(0.182)	-0.022	(0.182)
% Asian	-0.172	(0.787)	7.668***	(0.002)	0.826	(0.648)	0.826	(0.648)
% Black	-0.302	(0.165)	7.062***	(0.000)	-0.118	(0.920)	-0.118	(0.920)
% Native American	0.784	(0.684)	9.622***	(0.005)	-2.656	(0.304)	-2.656	(0.304)
% White	-0.289	(0.237)	7.234***	(0.000)	-0.154	(0.897)	-0.154	(0.897)
% Hispanic	-0.047	(0.351)	3.377***	(0.001)	-0.045	(0.949)	-0.045	(0.949)
Age 16-24	-0.251	(0.493)	0.019	(0.980)	-0.111	(0.837)	-0.111	(0.837)
Age 25-34	-1.199***	(0.007)	0.307	(0.774)	0.217	(0.770)	0.217	(0.770)
Age 35-44	1.131	(0.162)	0.255	(0.867)	0.946	(0.525)	0.946	(0.525)
Age 45-54	0.441	(0.420)	1.704	(0.494)	0.588	(0.505)	0.588	(0.505)
Age 55-64	-0.153	(0.877)	0.374	(0.844)	-0.562	(0.672)	-0.562	(0.672)
Age 65+	-0.232	(0.549)	-0.077	(0.931)	0.159	(0.778)	0.159	(0.778)
% Agriculture & Mining	0.404	(0.668)	0.299	(0.677)	0.822	(0.368)	0.822	(0.368)
% Construction	1.524*	(0.066)	1.081**	(0.040)	0.589	(0.416)	0.589	(0.416)
% Manufacturing	1.108	(0.144)	-0.187	(0.291)	0.131	(0.845)	0.131	(0.845)
% Transportation	1.434*	(0.063)	-0.619	(0.231)	0.115	(0.880)	0.115	(0.880)
% Trade	1.343*	(0.098)	0.300	(0.382)	0.254	(0.740)	0.254	(0.740)
% FIRE	0.699	(0.439)	-0.283	(0.693)	-0.516	(0.538)	-0.516	(0.538)
% Professional & Business services	1.665*	(0.067)	-0.596	(0.687)	1.885	(0.122)	1.885	(0.122)
% Arts, Accommodation & Food services	1.512*	(0.056)	2.686	(0.252)	0.527	(0.493)	0.527	(0.493)
% Education and Health services	0.799	(0.305)	-0.303	(0.503)	0.162	(0.813)	0.162	(0.813)
% Other services	1.549*	(0.080)	0.459	(0.706)	1.987	(0.143)	1.987	(0.143)
% Public Administration	1.191	(0.119)	0.000	(.)	0.104	(0.877)	0.104	(0.877)
year=1990	0.000	(.)						
year=2000	-0.105*	(0.092)						
year=2010	0.019	(0.829)						
Observations	435		145		145		145	
R-squared	0.858		0.835		0.825		0.825	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 20: Income Gini Coefficient: Fourth Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q4 Overtime

	All Years		1990s		2000s		2010s	
Gini	-0.452*	(0.082)	-0.771	(0.134)	-0.124	(0.720)	-0.061	(0.866)
Log Income per capita	-0.246***	(0.003)	-0.376**	(0.013)	-0.300**	(0.020)	0.096	(0.436)
Log(Income per capita) spatial lag	-0.203***	(0.006)	-0.108	(0.249)	-0.197**	(0.023)	-0.056	(0.472)
% with high school diploma	0.256	(0.356)	-0.515	(0.142)	-0.478	(0.257)	-0.564	(0.141)
% with some college	-0.034	(0.881)	0.226	(0.620)	0.231	(0.571)	-1.212**	(0.012)
% with Bachelor's degree	0.275	(0.351)	-0.038	(0.949)	-0.283	(0.481)	0.254	(0.552)
% with Graduate degree	1.233**	(0.017)	-0.148	(0.905)	0.411	(0.547)	-0.952*	(0.096)
Amenity value	0.010*	(0.093)	0.033***	(0.009)	0.009	(0.327)	0.005	(0.543)
Log Population	-0.017*	(0.051)	-0.029*	(0.054)	0.010	(0.396)	-0.009	(0.393)
% Asian	0.140	(0.607)	0.100	(0.832)	-0.288	(0.697)	-0.095	(0.740)
% Black	-0.154	(0.431)	0.050	(0.914)	-0.321	(0.481)	-0.208	(0.365)
% Native American	1.070	(0.402)	4.128	(0.234)	0.273	(0.839)	-1.046	(0.308)
% White	-0.262	(0.206)	-0.133	(0.758)	-0.301	(0.478)	-0.133	(0.503)
% Hispanic	0.005	(0.881)	-0.139	(0.451)	-0.273	(0.142)	-0.098*	(0.098)
Age 16-24	-0.726**	(0.033)	0.527	(0.603)	0.034	(0.955)	-0.332	(0.461)
Age 25-34	-0.236	(0.578)	1.025	(0.300)	-0.202	(0.779)	-0.084	(0.896)
Age 35-44	1.804***	(0.006)	2.414*	(0.080)	2.409**	(0.047)	-1.353	(0.317)
Age 45-54	0.025	(0.971)	3.445*	(0.080)	0.112	(0.903)	-0.045	(0.966)
Age 55-64	0.443	(0.577)	-2.337	(0.342)	0.788	(0.513)	-0.685	(0.557)
Age 65+	0.277	(0.374)	1.741**	(0.022)	0.625	(0.204)	-0.192	(0.725)
% Agriculture & Mining	-0.204	(0.838)	0.047	(0.938)	0.688	(0.520)	-2.398**	(0.023)
% Construction	0.761	(0.385)	2.066**	(0.021)	1.157	(0.118)	-0.537	(0.582)
% Manufacturing	0.281	(0.738)	0.810**	(0.027)	-0.065	(0.932)	-1.125	(0.211)
% Transportation	0.415	(0.632)	0.964*	(0.069)	0.009	(0.991)	-0.281	(0.761)
% Trade	0.590	(0.495)	0.812	(0.195)	-0.174	(0.848)	-1.092	(0.241)
% FIRE	0.086	(0.926)	1.380*	(0.087)	-0.090	(0.916)	-1.499	(0.144)
% Professional & Business services	0.745	(0.491)	1.522	(0.164)	0.766	(0.485)	-1.185	(0.246)
% Arts, Accommodation & Food services	0.436	(0.622)	-0.700	(0.539)	-0.072	(0.927)	-1.070	(0.216)
% Education and Health services	0.530	(0.561)	0.894	(0.107)	0.433	(0.622)	-0.937	(0.325)
% Other services	0.660	(0.450)	3.293**	(0.047)	-1.177	(0.505)	-1.157	(0.503)
% Public Administration	0.102	(0.909)	0.000	(.)	0.258	(0.742)	-1.346	(0.122)
year=1990	0.000	(.)						
year=2000	-0.151***	(0.003)						
year=2010	-0.026	(0.692)						
Observations	438		146		146		146	
R-squared	0.869		0.806		0.859		0.832	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 21: Income Gini Coefficient: Fifth Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q5 Overtime

	All Years		1990s		2000s		2010s	
Gini	1.487***	(0.000)	1.983***	(0.000)	0.763***	(0.004)	1.004***	(0.000)
Log Income per capita	-0.255***	(0.007)	-0.248*	(0.091)	-0.356**	(0.013)	-0.288**	(0.015)
Log(Income per capita) spatial lag	-0.013	(0.566)	0.045***	(0.001)	-0.025	(0.688)	0.211***	(0.005)
% with high school diploma	1.006***	(0.001)	1.064*	(0.098)	-0.042	(0.944)	1.128***	(0.008)
% with some college	0.161	(0.676)	0.610	(0.308)	0.623	(0.294)	0.413	(0.369)
% with Bachelor's degree	0.689*	(0.074)	0.558	(0.509)	0.256	(0.652)	1.677***	(0.000)
% with Graduate degree	0.494	(0.380)	0.351	(0.691)	0.797	(0.183)	-0.128	(0.814)
Amenity value	0.018*	(0.051)	0.029*	(0.076)	0.015	(0.175)	0.026**	(0.015)
Log Population	-0.019**	(0.050)	-0.025**	(0.041)	0.020*	(0.063)	-0.007	(0.539)
% Asian	0.997***	(0.001)	2.238*	(0.054)	0.549	(0.264)	0.147	(0.572)
% Black	0.259	(0.155)	1.328**	(0.032)	0.884**	(0.023)	-0.175	(0.383)
% Native American	-1.030	(0.700)	-0.873	(0.896)	-2.582	(0.333)	-1.301	(0.435)
% White	0.490**	(0.022)	1.531**	(0.013)	1.014**	(0.017)	-0.102	(0.641)
% Hispanic	-0.002	(0.971)	0.387	(0.204)	0.424***	(0.008)	-0.116	(0.145)
Age 16-24	-1.492***	(0.003)	-0.015	(0.988)	0.499	(0.356)	-0.750	(0.167)
Age 25-34	0.451	(0.338)	0.644	(0.505)	1.908***	(0.000)	1.894***	(0.000)
Age 35-44	1.556	(0.109)	3.928**	(0.044)	1.067	(0.541)	-2.537*	(0.060)
Age 45-54	-3.275**	(0.016)	0.205	(0.930)	1.201	(0.464)	2.601	(0.239)
Age 55-64	2.317	(0.120)	0.048	(0.981)	2.619	(0.197)	-1.872	(0.496)
Age 65+	-1.441**	(0.014)	0.050	(0.938)	0.267	(0.638)	-0.030	(0.976)
% Agriculture & Mining	-0.832	(0.471)	-1.584	(0.373)	1.588	(0.146)	0.185	(0.821)
% Construction	-2.106*	(0.080)	-1.310	(0.284)	1.171*	(0.064)	0.353	(0.604)
% Manufacturing	-1.133	(0.237)	-0.240	(0.614)	-0.048	(0.950)	-0.533	(0.427)
% Transportation	-1.119	(0.291)	-0.574	(0.506)	0.679	(0.361)	-0.965	(0.190)
% Trade	-0.717	(0.458)	-0.901	(0.394)	-0.707	(0.213)	-1.715**	(0.020)
% FIRE	-1.925*	(0.055)	-1.505*	(0.061)	0.015	(0.985)	-1.087	(0.155)
% Professional & Business services	-1.276	(0.257)	-0.964	(0.395)	-0.084	(0.932)	0.040	(0.955)
% Arts, Accommodation & Food services	-1.545*	(0.087)	-1.935	(0.186)	-0.459	(0.587)	-1.148	(0.107)
% Education and Health services	-0.680	(0.465)	-0.513	(0.436)	-0.516	(0.682)	-0.464	(0.527)
% Other services	-0.151	(0.899)	-0.076	(0.970)	0.033	(0.988)	-3.989***	(0.000)
% Public Administration	-0.633	(0.517)	0.000	(.)	0.099	(0.893)	-1.145	(0.109)
year=1990	0.000	(.)						
year=2000	-0.028	(0.810)						
year=2010	0.088	(0.520)						
Observations	426		142		142		142	
R-squared	0.755		0.812		0.860		0.852	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 22: Income Gini Coefficient: County Fixed Effects, Rural, Micropolitan and Outlying Metropolitan Counties

County Fixed Effects

	Rural		Micropo~n		Outlyin~o	
Gini	-0.309*	(0.070)	-0.713***	(0.001)	-0.927***	(0.000)
Log Income per capita	-1.571***	(0.000)	-1.236***	(0.000)	-1.310***	(0.000)
Log(Income per capita) spatial lag	0.365*	(0.059)	0.107**	(0.043)	0.176	(0.416)
% with high school diploma	-0.209	(0.121)	-0.252	(0.148)	-0.515**	(0.049)
% with some college	-0.145	(0.460)	-0.499**	(0.025)	-0.633*	(0.067)
% with Bachelor's degree	0.275	(0.253)	0.278	(0.383)	-0.382	(0.377)
% with Graduate degree	0.062	(0.867)	-0.081	(0.864)	0.630	(0.336)
Amenity value	0.000	(.)	0.000	(.)	0.000	(.)
Log Population	-0.178***	(0.004)	-0.057	(0.201)	-0.089*	(0.079)
% Asian	-1.382	(0.270)	-1.130	(0.241)	-0.507	(0.652)
% Black	-0.931***	(0.003)	-0.697**	(0.019)	-0.531	(0.233)
% Native American	0.281	(0.418)	-0.548	(0.210)	0.820	(0.110)
% White	-0.384**	(0.019)	-0.011	(0.955)	-0.247	(0.391)
% Hispanic	-0.041	(0.489)	0.005	(0.886)	-0.057	(0.481)
Age 16-24	0.659**	(0.021)	0.584	(0.118)	-0.372	(0.503)
Age 25-34	-0.449	(0.217)	-0.517	(0.275)	-1.616**	(0.027)
Age 35-44	0.260	(0.624)	-0.042	(0.932)	-0.189	(0.804)
Age 45-54	1.084**	(0.016)	0.877*	(0.059)	-0.569	(0.445)
Age 55-64	0.228	(0.653)	0.145	(0.720)	-0.942	(0.275)
Age 65+	0.590	(0.154)	0.334	(0.357)	0.639	(0.288)
% Agriculture & Mining	-0.889**	(0.034)	-0.502	(0.421)	-0.911	(0.328)
% Construction	-0.488	(0.263)	0.125	(0.855)	-0.713	(0.418)
% Manufacturing	-0.383	(0.356)	0.195	(0.755)	0.258	(0.747)
% Transportation	-0.885*	(0.062)	-0.036	(0.958)	-0.158	(0.865)
% Trade	-0.794**	(0.049)	-0.044	(0.945)	0.544	(0.514)
% FIRE	-0.609	(0.218)	0.186	(0.785)	0.890	(0.356)
% Professional & Business services	-0.583	(0.292)	0.030	(0.963)	-0.206	(0.809)
% Arts, Accommodation & Food services	-0.748*	(0.076)	-0.063	(0.924)	-0.120	(0.883)
% Education and Health services	-0.720*	(0.090)	0.239	(0.716)	0.237	(0.771)
% Other services	-0.815*	(0.054)	-0.424	(0.511)	0.147	(0.873)
% Public Administration	-0.805	(0.102)	0.417	(0.519)	0.211	(0.817)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	0.204**	(0.016)	0.158***	(0.000)	0.218**	(0.023)
year=2010	0.452***	(0.000)	0.384***	(0.000)	0.521***	(0.000)
Observations	3933		1909		1308	
R-squared	0.884		0.907		0.916	

p-values in parentheses
Sample year: 1990 2000 2010; Models include county and year fixed effects and geographically clustered standard errors.
* p<0.1, ** p<0.05, *** p<0.01

Table 23: Income Gini Coefficient: County Fixed Effects, Central Metropolitan Counties

	1st Qua~e		2nd		3rd		4th		5th Qua~e	
Gini	-0.659	(0.104)	-0.539	(0.172)	0.107	(0.859)	-0.962*	(0.080)	-0.195	(0.828)
Log Income per capita	-1.397***	(0.000)	-0.946***	(0.000)	-1.006***	(0.000)	-0.841***	(0.000)	-0.799***	(0.000)
Log(Income per capita) spatial lag	0.276*	(0.057)	-0.133	(0.325)	-0.207	(0.159)	-0.147***	(0.001)	-0.001	(0.961)
% with high school diploma	0.020	(0.951)	-0.324	(0.415)	-0.517	(0.305)	-0.106	(0.830)	0.606	(0.414)
% with some college	-0.732**	(0.047)	-0.140	(0.748)	-1.414**	(0.012)	-0.688	(0.171)	-2.009***	(0.000)
% with Bachelor's degree	1.049	(0.119)	-0.035	(0.964)	0.065	(0.931)	-1.405*	(0.065)	-0.112	(0.904)
% with Graduate degree	-0.443	(0.572)	-0.688	(0.436)	-0.119	(0.904)	1.350	(0.167)	-0.473	(0.652)
Amenity value	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
Log Population	0.008	(0.873)	-0.050	(0.519)	-0.125*	(0.061)	-0.141**	(0.021)	-0.252***	(0.006)
% Asian	-3.473***	(0.005)	1.416	(0.141)	-0.160	(0.897)	0.108	(0.900)	0.306	(0.391)
% Black	-0.633	(0.215)	-0.476	(0.369)	-0.498	(0.246)	-1.007***	(0.009)	0.087	(0.726)
% Native American	1.522**	(0.026)	2.825	(0.273)	0.920	(0.753)	-2.102	(0.524)	-3.417	(0.331)
% White	-0.002	(0.992)	-0.239	(0.517)	-0.264	(0.482)	-0.494*	(0.097)	0.441*	(0.088)
% Hispanic	-0.106**	(0.027)	0.124*	(0.087)	-0.036	(0.623)	0.112**	(0.040)	0.081	(0.426)
Age 16-24	-0.300	(0.505)	0.308	(0.601)	-0.569	(0.334)	-1.725**	(0.023)	-2.480***	(0.001)
Age 25-34	-0.973	(0.185)	-1.871*	(0.086)	-1.326	(0.180)	-1.316	(0.173)	-0.525	(0.644)
Age 35-44	-0.004	(0.995)	-0.386	(0.756)	0.115	(0.916)	0.479	(0.660)	-2.243	(0.164)
Age 45-54	-0.310	(0.632)	-0.053	(0.958)	-0.094	(0.927)	-0.255	(0.767)	-3.276**	(0.012)
Age 55-64	-0.526	(0.595)	-0.286	(0.778)	-0.099	(0.926)	0.884	(0.408)	-1.636	(0.229)
Age 65+	-0.466	(0.449)	0.376	(0.671)	-1.585*	(0.067)	-0.614	(0.382)	-1.934**	(0.032)
% Agriculture & Mining	-0.760	(0.433)	-1.639	(0.213)	0.987	(0.464)	-0.562	(0.718)	-2.282	(0.271)
% Construction	-1.953*	(0.055)	-0.843	(0.497)	-0.694	(0.516)	-0.555	(0.612)	-2.814**	(0.024)
% Manufacturing	-0.309	(0.696)	-0.142	(0.896)	0.318	(0.716)	0.435	(0.629)	-0.986	(0.363)
% Transportation	-0.077	(0.923)	-0.689	(0.527)	0.802	(0.403)	-0.058	(0.961)	-1.104	(0.253)
% Trade	-0.931	(0.261)	-0.153	(0.891)	0.322	(0.727)	0.087	(0.931)	0.154	(0.914)
% FIRE	-0.007	(0.994)	-0.112	(0.929)	0.958	(0.383)	1.011	(0.341)	-1.878	(0.249)
% Professional & Business services	-0.551	(0.506)	-0.196	(0.868)	0.932	(0.335)	0.630	(0.566)	-0.448	(0.696)
% Arts, Accommodation & Food services	-0.268	(0.761)	0.417	(0.714)	0.807	(0.401)	0.383	(0.689)	0.705	(0.569)
% Education and Health services	-0.028	(0.973)	0.581	(0.577)	0.294	(0.743)	1.111	(0.328)	2.343	(0.122)
% Other services	-0.495	(0.572)	0.106	(0.924)	0.769	(0.384)	1.205	(0.280)	0.179	(0.849)
% Public Administration	-1.612	(0.120)	-0.632	(0.627)	0.598	(0.503)	0.086	(0.936)	-2.380*	(0.087)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	0.162**	(0.026)	0.050	(0.556)	0.222**	(0.017)	0.066	(0.382)	0.057	(0.645)
year=2010	0.451***	(0.000)	0.234*	(0.058)	0.493***	(0.000)	0.282***	(0.002)	0.248	(0.165)
Observations	435		432		435		438		426	
R-squared	0.944		0.936		0.939		0.950		0.925	

p-values in parentheses

Sample year: 1990 2000 2010; Models include county and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 24: Low- and High-End Ratio: Rural, Micropolitan and Metropolitan Counties

Table: Low-High End Ratio Growth Regressions by Geography

	Rural		Micro		Metro	
Low-end Ratio	-0.004	(0.352)	-0.001	(0.911)	0.034***	(0.000)
High-end Ratio	-0.069***	(0.000)	-0.073***	(0.000)	0.029*	(0.068)
Log Income per capita	-0.620***	(0.000)	-0.441***	(0.000)	-0.292***	(0.000)
Log(Income per capita) spatial lag	0.078	(0.211)	-0.062*	(0.087)	-0.013	(0.628)
% with high school diploma	-0.012	(0.852)	-0.073	(0.380)	0.435***	(0.001)
% with some college	-0.108	(0.349)	-0.018	(0.869)	0.105	(0.459)
% with Bachelor's degree	1.157***	(0.000)	0.897***	(0.000)	0.752***	(0.000)
% with Graduate degree	0.362	(0.143)	0.458**	(0.018)	0.676***	(0.001)
Amenity value	0.002	(0.633)	0.007**	(0.022)	0.015***	(0.000)
Log Population	-0.003	(0.562)	-0.003	(0.476)	-0.016***	(0.001)
% Asian	-1.305*	(0.061)	0.063	(0.877)	0.466***	(0.000)
% Black	-0.124*	(0.096)	0.014	(0.873)	0.041	(0.669)
% Native American	-0.332***	(0.000)	-0.094	(0.255)	0.052	(0.595)
% White	-0.109	(0.143)	0.073	(0.409)	0.148	(0.139)
% Hispanic	-0.013	(0.417)	-0.007	(0.700)	-0.015	(0.379)
Age 16-24	-0.147	(0.485)	-0.511***	(0.002)	-0.734***	(0.001)
Age 25-34	-1.172***	(0.001)	-1.140***	(0.000)	-0.178	(0.478)
Age 35-44	0.640	(0.125)	0.366	(0.244)	1.946***	(0.000)
Age 45-54	1.238***	(0.000)	0.908***	(0.005)	-1.241**	(0.014)
Age 55-64	-0.222	(0.530)	-0.703**	(0.020)	0.436	(0.357)
Age 65+	0.349	(0.149)	-0.002	(0.990)	-0.109	(0.598)
% Agriculture & Mining	-0.759***	(0.005)	-0.134	(0.770)	-1.004	(0.177)
% Construction	-0.398	(0.147)	0.398	(0.405)	-0.817	(0.305)
% Manufacturing	-0.657**	(0.013)	-0.103	(0.824)	-1.036	(0.184)
% Transportation	-0.866***	(0.007)	-0.019	(0.968)	-0.795	(0.321)
% Trade	-0.628**	(0.021)	-0.015	(0.975)	-0.876	(0.203)
% FIRE	-0.094	(0.737)	0.275	(0.587)	-1.392	(0.120)
% Professional & Business services	-0.031	(0.925)	0.308	(0.535)	-0.832	(0.344)
% Arts, Accommodation & Food services	-0.686**	(0.013)	0.172	(0.723)	-0.930	(0.249)
% Education and Health services	-0.903***	(0.001)	-0.081	(0.862)	-0.957	(0.208)
% Other services	-0.637**	(0.027)	-0.267	(0.573)	-1.066	(0.115)
% Public Administration	-0.941***	(0.005)	-0.065	(0.889)	-0.932	(0.216)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.152***	(0.000)	-0.180***	(0.000)	-0.179***	(0.000)
year=2010	-0.071	(0.149)	-0.064	(0.107)	-0.056	(0.219)
Observations	3925		1909		3476	
R-squared	0.749		0.801		0.755	

p-values in parentheses

Sample all years pooled; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 25: Low- and High-End Ratio: Central and Outlying Metropolitan Counties

Metro Counties: Central Vs Outlying Counties, Weighted Vs Unweighted

	Central		Central~T		Outlying		Outlyin~T	
Low-end Ratio	0.034***	(0.000)	0.026***	(0.000)	0.016	(0.126)	0.001	(0.898)
High-end Ratio	0.035**	(0.035)	-0.006	(0.637)	-0.066***	(0.000)	-0.086***	(0.000)
Log Income per capita	-0.278***	(0.000)	-0.295***	(0.000)	-0.358***	(0.000)	-0.451***	(0.000)
Log(Income per capita) spatial lag	-0.012	(0.626)	-0.016	(0.559)	-0.215***	(0.003)	-0.128*	(0.065)
% with high school diploma	0.544***	(0.000)	0.356***	(0.003)	-0.242**	(0.045)	-0.220*	(0.081)
% with some college	0.139	(0.359)	0.064	(0.659)	-0.053	(0.784)	0.011	(0.951)
% with Bachelor's degree	0.796***	(0.000)	0.545***	(0.001)	0.202	(0.457)	0.413	(0.146)
% with Graduate degree	0.646***	(0.001)	0.870***	(0.000)	1.198***	(0.002)	1.320***	(0.000)
Amenity value	0.015***	(0.000)	0.011***	(0.001)	0.001	(0.893)	0.003	(0.553)
Log Population	-0.015***	(0.004)	-0.015***	(0.000)	-0.009	(0.167)	-0.019***	(0.001)
% Asian	0.461***	(0.001)	0.346*	(0.078)	0.511	(0.435)	-0.671	(0.190)
% Black	0.039	(0.699)	0.003	(0.969)	-0.166	(0.347)	-0.317*	(0.064)
% Native American	0.102	(0.312)	-0.007	(0.936)	-0.560**	(0.037)	-0.545***	(0.004)
% White	0.151	(0.162)	0.064	(0.325)	-0.177	(0.291)	-0.365**	(0.031)
% Hispanic	-0.012	(0.528)	-0.009	(0.603)	-0.062	(0.278)	-0.079	(0.137)
Age 16-24	-0.727***	(0.002)	-0.480***	(0.000)	-0.894***	(0.000)	-0.527***	(0.004)
Age 25-34	-0.050	(0.842)	-0.276	(0.120)	-1.866***	(0.000)	-1.384***	(0.007)
Age 35-44	2.196***	(0.000)	1.356***	(0.000)	0.256	(0.585)	0.643	(0.182)
Age 45-54	-1.570***	(0.006)	-0.228	(0.545)	-0.329	(0.562)	0.643	(0.181)
Age 55-64	0.936*	(0.078)	-0.396	(0.386)	-0.624	(0.251)	-1.255**	(0.019)
Age 65+	-0.228	(0.310)	0.080	(0.594)	-0.356	(0.280)	0.247	(0.424)
% Agriculture & Mining	-0.807	(0.263)	0.085	(0.865)	-0.119	(0.913)	-0.213	(0.701)
% Construction	-0.660	(0.405)	0.407	(0.445)	0.135	(0.899)	0.083	(0.883)
% Manufacturing	-0.834	(0.280)	-0.189	(0.710)	-0.099	(0.924)	-0.152	(0.774)
% Transportation	-0.613	(0.436)	0.038	(0.942)	0.532	(0.618)	0.127	(0.817)
% Trade	-0.553	(0.411)	-0.203	(0.693)	0.126	(0.908)	-0.127	(0.824)
% FIRE	-1.258	(0.158)	0.106	(0.853)	0.563	(0.608)	0.898	(0.151)
% Professional & Business services	-0.604	(0.491)	0.207	(0.728)	0.366	(0.750)	0.526	(0.369)
% Arts, Accommodation & Food services	-0.752	(0.352)	0.227	(0.684)	-0.167	(0.869)	0.053	(0.922)
% Education and Health services	-0.678	(0.367)	-0.210	(0.691)	-0.237	(0.814)	-0.387	(0.466)
% Other services	-0.669	(0.317)	-0.390	(0.494)	-0.075	(0.945)	0.126	(0.841)
% Public Administration	-0.673	(0.367)	-0.149	(0.776)	-0.183	(0.855)	-0.434	(0.390)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.151***	(0.000)	-0.227***	(0.000)	-0.122***	(0.005)	-0.160***	(0.000)
year=2010	-0.037	(0.475)	-0.124***	(0.000)	0.022	(0.707)	-0.017	(0.739)
Observations	2168		2168		1308		1308	
R-squared	0.760		0.792		0.809		0.783	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 26: Low- and High-End Ratio: Central Metropolitan Counties

Table: Low & High End Ratio Growth Regressions: Metro Central Counties by Population Quartile WEIGHTED

	1st		2nd		3rd		4th		5th	
Low-end Ratio	0.015	(0.293)	0.015	(0.295)	0.027**	(0.018)	0.044***	(0.010)	0.027**	(0.037)
High-end Ratio	-0.052**	(0.049)	-0.062**	(0.019)	-0.060***	(0.006)	-0.065***	(0.003)	0.087***	(0.001)
Log Income per capita	-0.515***	(0.000)	-0.194**	(0.012)	-0.311***	(0.001)	-0.268***	(0.001)	-0.305***	(0.006)
Log(Income per capita) spati~l	-0.098	(0.227)	-0.142*	(0.056)	-0.199*	(0.068)	-0.191**	(0.012)	-0.011	(0.597)
% with high school diploma	0.485**	(0.044)	-0.254	(0.261)	0.070	(0.754)	0.430	(0.140)	1.137***	(0.000)
% with some college	-0.043	(0.878)	-0.343	(0.182)	-0.205	(0.431)	0.227	(0.350)	0.079	(0.842)
% with Bachelor's degree	1.074***	(0.005)	0.328	(0.295)	0.683**	(0.024)	0.450	(0.150)	0.949**	(0.014)
% with Graduate degree	0.881	(0.110)	0.223	(0.578)	0.902**	(0.024)	1.558***	(0.002)	0.678	(0.199)
Amenity value	0.000	(0.980)	-0.001	(0.866)	0.030***	(0.001)	0.010*	(0.099)	0.021**	(0.044)
Log Population	-0.023***	(0.002)	-0.045***	(0.001)	-0.042***	(0.004)	-0.013	(0.111)	-0.015	(0.105)
% Asian	0.396	(0.560)	-1.494**	(0.047)	-0.191	(0.767)	0.124	(0.654)	0.937***	(0.003)
% Black	-0.150	(0.310)	-0.243	(0.343)	-0.323	(0.155)	-0.247	(0.232)	0.269	(0.133)
% Native American	-0.086	(0.630)	0.283	(0.746)	1.151	(0.556)	0.930	(0.489)	-0.978	(0.712)
% White	-0.036	(0.796)	-0.171	(0.478)	-0.300	(0.236)	-0.283	(0.177)	0.481**	(0.021)
% Hispanic	-0.046	(0.173)	0.141***	(0.003)	-0.020	(0.694)	0.020	(0.592)	-0.005	(0.918)
Age 16-24	-0.284	(0.351)	-0.505	(0.149)	-0.393	(0.296)	-0.992***	(0.006)	-1.502***	(0.002)
Age 25-34	-1.456**	(0.031)	-1.896***	(0.001)	-1.053**	(0.027)	-0.253	(0.546)	0.373	(0.388)
Age 35-44	2.219***	(0.001)	0.486	(0.471)	0.960	(0.251)	1.591**	(0.017)	1.410	(0.132)
Age 45-54	-0.516	(0.414)	-0.808	(0.269)	0.463	(0.410)	0.105	(0.877)	-3.143**	(0.018)
Age 55-64	0.295	(0.674)	-1.001	(0.190)	-0.412	(0.673)	-0.053	(0.949)	2.491*	(0.092)
Age 65+	-0.251	(0.577)	-0.150	(0.780)	-0.107	(0.787)	0.434	(0.187)	-1.374**	(0.017)
% Agriculture & Mining	-1.146	(0.156)	-1.087	(0.185)	0.434	(0.648)	-0.350	(0.717)	-0.524	(0.671)
% Construction	-1.267	(0.198)	-0.550	(0.525)	1.138	(0.151)	0.742	(0.363)	-1.479	(0.211)
% Manufacturing	-1.389*	(0.087)	-0.866	(0.283)	0.854	(0.249)	0.057	(0.942)	-0.798	(0.392)
% Transportation	-1.622*	(0.064)	-0.588	(0.514)	1.170	(0.120)	0.226	(0.779)	-0.762	(0.459)
% Trade	-1.414*	(0.082)	-0.607	(0.460)	1.137	(0.154)	0.375	(0.639)	-0.272	(0.768)
% FIRE	-0.421	(0.658)	-0.681	(0.435)	0.526	(0.558)	-0.016	(0.985)	-1.601	(0.104)
% Professional & Business se~c	-0.981	(0.256)	-0.318	(0.711)	1.453	(0.100)	0.274	(0.781)	-0.966	(0.382)
% Arts, Accommodation & Food~r	-0.808	(0.351)	0.239	(0.780)	1.321*	(0.089)	0.161	(0.846)	-1.313	(0.138)
% Education and Health servi~s	-1.294	(0.125)	-0.594	(0.461)	0.540	(0.486)	0.111	(0.893)	-0.366	(0.687)
% Other services	-1.087	(0.193)	-0.420	(0.694)	1.465*	(0.089)	0.436	(0.593)	0.235	(0.831)
% Public Administration	-1.627*	(0.056)	-0.585	(0.473)	0.919	(0.219)	-0.174	(0.833)	-0.392	(0.685)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	-0.110*	(0.055)	-0.240***	(0.000)	-0.121*	(0.053)	-0.148***	(0.002)	0.010	(0.930)
year=2010	0.052	(0.517)	-0.166**	(0.036)	-0.005	(0.958)	-0.018	(0.770)	0.117	(0.382)
Observations	435		432		435		438		426	
R-squared	0.802		0.834		0.862		0.873		0.761	

p-values in parentheses

Sample all years pooled; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 27: Low- and High-End Ratio: Rural Counties Over Time

Rural Counties Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	-0.004	(0.352)	-0.002	(0.799)	-0.006	(0.366)	-0.003	(0.714)
High-end Ratio	-0.069***	(0.000)	-0.057***	(0.000)	-0.080***	(0.000)	-0.051***	(0.001)
Log Income per capita	-0.620***	(0.000)	-0.806***	(0.000)	-0.503***	(0.000)	-0.500***	(0.000)
Log(Income per capita) spatial lag	0.078	(0.211)	0.114*	(0.077)	0.042	(0.691)	0.230***	(0.009)
% with high school diploma	-0.012	(0.852)	0.278*	(0.062)	0.106	(0.246)	0.104	(0.305)
% with some college	-0.108	(0.349)	-0.000	(0.999)	-0.022	(0.896)	0.003	(0.982)
% with Bachelor's degree	1.157***	(0.000)	1.097***	(0.000)	1.004***	(0.000)	0.748***	(0.000)
% with Graduate degree	0.362	(0.143)	0.890**	(0.020)	0.362	(0.363)	0.432*	(0.082)
Amenity value	0.002	(0.633)	0.002	(0.762)	0.001	(0.908)	0.003	(0.567)
Log Population	-0.003	(0.562)	0.001	(0.932)	0.002	(0.687)	-0.002	(0.748)
% Asian	-1.305*	(0.061)	-3.297***	(0.009)	2.737**	(0.030)	-1.115	(0.153)
% Black	-0.124*	(0.096)	-0.157	(0.119)	0.230	(0.177)	-0.013	(0.939)
% Native American	-0.332***	(0.000)	-0.447***	(0.000)	0.173	(0.382)	-0.280	(0.105)
% White	-0.109	(0.143)	-0.185**	(0.031)	0.267	(0.101)	-0.015	(0.925)
% Hispanic	-0.013	(0.417)	-0.033	(0.447)	0.045	(0.330)	-0.015	(0.537)
Age 16-24	-0.147	(0.485)	0.583	(0.106)	-0.658**	(0.021)	-0.463	(0.217)
Age 25-34	-1.172***	(0.001)	0.315	(0.559)	-2.102***	(0.000)	-0.223	(0.709)
Age 35-44	0.640	(0.125)	2.169***	(0.000)	1.406**	(0.022)	-0.113	(0.830)
Age 45-54	1.238***	(0.000)	0.086	(0.878)	0.575	(0.281)	-0.129	(0.697)
Age 55-64	-0.222	(0.530)	2.221***	(0.000)	-0.430	(0.367)	0.131	(0.847)
Age 65+	0.349	(0.149)	0.587	(0.177)	-0.040	(0.875)	0.046	(0.888)
% Agriculture & Mining	-0.759***	(0.005)	0.265	(0.190)	0.437	(0.313)	-0.528	(0.104)
% Construction	-0.398	(0.147)	1.019***	(0.001)	0.107	(0.815)	-0.273	(0.425)
% Manufacturing	-0.657**	(0.013)	0.561***	(0.003)	-0.179	(0.681)	-0.428	(0.186)
% Transportation	-0.866***	(0.007)	0.267	(0.256)	-0.234	(0.663)	-0.708*	(0.066)
% Trade	-0.628**	(0.021)	0.342	(0.109)	0.085	(0.829)	-0.339	(0.277)
% FIRE	-0.094	(0.737)	1.804***	(0.000)	0.032	(0.956)	-0.188	(0.564)
% Professional & Business services	-0.031	(0.925)	1.374***	(0.000)	0.923	(0.144)	-0.462	(0.181)
% Arts, Accommodation & Food services	-0.686**	(0.013)	0.692	(0.536)	0.258	(0.508)	-0.446	(0.196)
% Education and Health services	-0.903***	(0.001)	0.183	(0.393)	-0.049	(0.906)	-0.661**	(0.036)
% Other services	-0.637**	(0.027)	0.717*	(0.063)	0.289	(0.560)	-0.197	(0.582)
% Public Administration	-0.941***	(0.005)	0.000	(.)	-0.400	(0.444)	-0.887**	(0.016)
year=1990	0.000	(.)						
year=2000	-0.152***	(0.000)						
year=2010	-0.071	(0.149)						
Observations	3925		1312		1311		1302	
R-squared	0.749		0.510		0.488		0.318	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 28: Low- and High-End Ratio: Micropolitan Counties Over Time

Micropolitan Counties Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	-0.001	(0.911)	-0.017**	(0.046)	0.029***	(0.002)	0.004	(0.517)
High-end Ratio	-0.073***	(0.000)	-0.047**	(0.028)	-0.110***	(0.000)	-0.038***	(0.010)
Log Income per capita	-0.441***	(0.000)	-0.589***	(0.000)	-0.394***	(0.000)	-0.319***	(0.000)
Log(Income per capita) spatial lag	-0.062*	(0.087)	0.034	(0.499)	0.052	(0.521)	0.046	(0.439)
% with high school diploma	-0.073	(0.380)	0.275**	(0.048)	-0.054	(0.668)	-0.063	(0.672)
% with some college	-0.018	(0.869)	0.266	(0.127)	0.129	(0.426)	0.017	(0.923)
% with Bachelor's degree	0.897***	(0.000)	0.760***	(0.005)	1.205***	(0.000)	0.474**	(0.032)
% with Graduate degree	0.458**	(0.018)	0.822*	(0.054)	0.216	(0.504)	0.771***	(0.009)
Amenity value	0.007**	(0.022)	0.009	(0.104)	0.002	(0.671)	0.009*	(0.083)
Log Population	-0.003	(0.476)	-0.005	(0.473)	-0.001	(0.857)	-0.002	(0.738)
% Asian	0.063	(0.877)	-0.987	(0.229)	2.113***	(0.001)	-0.811*	(0.074)
% Black	0.014	(0.873)	0.105	(0.606)	0.494**	(0.022)	-0.083	(0.539)
% Native American	-0.094	(0.255)	-0.074	(0.732)	0.369*	(0.095)	-0.090	(0.494)
% White	0.073	(0.409)	0.029	(0.887)	0.588***	(0.005)	0.032	(0.813)
% Hispanic	-0.007	(0.700)	-0.052	(0.586)	0.116	(0.167)	-0.011	(0.690)
Age 16-24	-0.511***	(0.002)	0.260	(0.384)	-1.371***	(0.000)	-0.591**	(0.019)
Age 25-34	-1.140***	(0.000)	0.324	(0.458)	-1.713***	(0.000)	-0.472	(0.276)
Age 35-44	0.366	(0.244)	2.017***	(0.001)	0.631	(0.292)	-0.993*	(0.093)
Age 45-54	0.908***	(0.005)	1.381**	(0.037)	-0.603	(0.241)	0.101	(0.859)
Age 55-64	-0.703**	(0.020)	0.468	(0.500)	0.076	(0.885)	-0.087	(0.874)
Age 65+	-0.002	(0.990)	0.637**	(0.039)	-0.744***	(0.010)	-0.505	(0.114)
% Agriculture & Mining	-0.134	(0.770)	-0.015	(0.921)	0.756	(0.172)	-0.290	(0.662)
% Construction	0.398	(0.405)	1.116***	(0.000)	0.402	(0.488)	-0.359	(0.595)
% Manufacturing	-0.103	(0.824)	0.180	(0.204)	0.127	(0.818)	-0.259	(0.688)
% Transportation	-0.019	(0.968)	-0.038	(0.880)	0.769	(0.161)	-0.426	(0.544)
% Trade	-0.015	(0.975)	0.255	(0.150)	0.354	(0.554)	-0.315	(0.647)
% FIRE	0.275	(0.587)	0.474	(0.227)	0.193	(0.764)	-0.041	(0.956)
% Professional & Business services	0.308	(0.535)	0.615	(0.100)	0.844	(0.197)	-0.314	(0.653)
% Arts, Accommodation & Food services	0.172	(0.723)	1.388*	(0.068)	0.699	(0.217)	-0.235	(0.721)
% Education and Health services	-0.081	(0.862)	0.072	(0.687)	0.493	(0.385)	-0.501	(0.449)
% Other services	-0.267	(0.573)	0.335	(0.274)	1.078	(0.136)	-0.376	(0.616)
% Public Administration	-0.065	(0.889)	0.000	(.)	0.019	(0.974)	-0.307	(0.649)
year=1990	0.000	(.)						
year=2000	-0.180***	(0.000)						
year=2010	-0.064	(0.107)						
Observations	1909		637		636		636	
R-squared	0.801		0.569		0.635		0.313	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 29: Low- and High-End Ratio: Outlying Metropolitan Counties Over Time

Outlying Metropolitan Counties Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.016	(0.126)	0.021	(0.158)	0.029**	(0.015)	-0.001	(0.951)
High-end Ratio	-0.066***	(0.000)	-0.057**	(0.012)	-0.121***	(0.000)	-0.007	(0.756)
Log Income per capita	-0.358***	(0.000)	-0.467***	(0.000)	-0.242***	(0.003)	-0.338***	(0.000)
Log(Income per capita) spatial lag	-0.215***	(0.003)	-0.113	(0.323)	0.041	(0.682)	-0.101	(0.368)
% with high school diploma	-0.242**	(0.045)	-0.292	(0.103)	-0.077	(0.651)	-0.148	(0.473)
% with some college	-0.053	(0.784)	-0.079	(0.780)	0.036	(0.876)	-0.007	(0.977)
% with Bachelor's degree	0.202	(0.457)	1.067***	(0.008)	0.077	(0.800)	0.365	(0.171)
% with Graduate degree	1.198***	(0.002)	0.453	(0.482)	1.184*	(0.055)	1.120**	(0.017)
Amenity value	0.001	(0.893)	0.021**	(0.011)	-0.001	(0.890)	-0.006	(0.487)
Log Population	-0.009	(0.167)	0.004	(0.672)	-0.000	(0.955)	-0.012	(0.145)
% Asian	0.511	(0.435)	-3.387***	(0.001)	0.048	(0.942)	-0.444	(0.451)
% Black	-0.166	(0.347)	0.156	(0.778)	-0.306	(0.428)	-0.330	(0.329)
% Native American	-0.560**	(0.037)	-0.296	(0.615)	-0.223	(0.639)	-0.816*	(0.089)
% White	-0.177	(0.291)	0.042	(0.938)	-0.222	(0.546)	-0.351	(0.275)
% Hispanic	-0.062	(0.278)	-0.032	(0.868)	-0.191	(0.302)	-0.156**	(0.041)
Age 16-24	-0.894***	(0.000)	0.358	(0.371)	-0.630**	(0.042)	-1.229***	(0.004)
Age 25-34	-1.866***	(0.000)	0.075	(0.933)	-2.239***	(0.000)	-1.505***	(0.007)
Age 35-44	0.256	(0.585)	2.031*	(0.057)	-0.445	(0.540)	-0.246	(0.738)
Age 45-54	-0.329	(0.562)	0.841	(0.448)	-0.304	(0.656)	-0.828	(0.311)
Age 55-64	-0.624	(0.251)	0.160	(0.866)	-0.103	(0.875)	-0.548	(0.352)
Age 65+	-0.356	(0.280)	0.392	(0.510)	-0.327	(0.298)	-0.972**	(0.014)
% Agriculture & Mining	-0.119	(0.913)	0.354	(0.196)	1.334**	(0.027)	-0.198	(0.801)
% Construction	0.135	(0.899)	0.906**	(0.017)	0.369	(0.551)	0.296	(0.686)
% Manufacturing	-0.099	(0.924)	0.370*	(0.079)	0.337	(0.522)	-0.235	(0.746)
% Transportation	0.532	(0.618)	0.518*	(0.086)	1.147**	(0.049)	0.393	(0.632)
% Trade	0.126	(0.908)	0.353	(0.243)	0.422	(0.462)	-0.251	(0.721)
% FIRE	0.563	(0.608)	1.424***	(0.005)	0.860	(0.184)	0.071	(0.941)
% Professional & Business services	0.366	(0.750)	1.462**	(0.025)	0.947	(0.127)	-0.131	(0.870)
% Arts, Accommodation & Food services	-0.167	(0.869)	-1.817	(0.120)	0.657	(0.204)	-0.312	(0.655)
% Education and Health services	-0.237	(0.814)	-0.049	(0.876)	0.331	(0.560)	-0.404	(0.564)
% Other services	-0.075	(0.945)	1.037*	(0.067)	1.408*	(0.075)	0.207	(0.816)
% Public Administration	-0.183	(0.855)	0.000	(.)	0.644	(0.195)	-0.599	(0.385)
year=1990	0.000	(.)						
year=2000	-0.122***	(0.005)						
year=2010	0.022	(0.707)						
Observations	1308		436		436		436	
R-squared	0.809		0.640		0.696		0.406	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 30: Low- and High-end Ratio: First Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q1 Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.015	(0.293)	-0.004	(0.867)	0.019	(0.485)	0.013	(0.517)
High-end Ratio	-0.052**	(0.049)	-0.035	(0.544)	-0.078*	(0.084)	-0.108***	(0.002)
Log Income per capita	-0.515***	(0.000)	-0.720***	(0.003)	-0.081	(0.708)	-0.190	(0.143)
Log(Income per capita) spatial lag	-0.098	(0.227)	0.020	(0.936)	-0.118	(0.418)	0.030	(0.682)
% with high school diploma	0.485**	(0.044)	0.825*	(0.057)	0.046	(0.916)	-0.520	(0.263)
% with some college	-0.043	(0.878)	0.347	(0.614)	0.059	(0.888)	-0.906**	(0.040)
% with Bachelor's degree	1.074***	(0.005)	0.848	(0.345)	1.163	(0.187)	0.420	(0.363)
% with Graduate degree	0.881	(0.110)	2.944**	(0.032)	0.341	(0.735)	-0.313	(0.638)
Amenity value	0.000	(0.980)	-0.017	(0.288)	-0.019	(0.305)	0.005	(0.628)
Log Population	-0.023***	(0.002)	-0.037**	(0.021)	-0.007	(0.494)	-0.022**	(0.014)
% Asian	0.396	(0.560)	0.042	(0.973)	0.653	(0.580)	0.243	(0.762)
% Black	-0.150	(0.310)	0.337	(0.431)	0.397	(0.389)	-0.017	(0.928)
% Native American	-0.086	(0.630)	0.823	(0.104)	0.161	(0.716)	-0.212	(0.406)
% White	-0.036	(0.796)	0.551	(0.130)	0.235	(0.450)	0.010	(0.958)
% Hispanic	-0.046	(0.173)	0.204	(0.211)	0.004	(0.986)	-0.067	(0.227)
Age 16-24	-0.284	(0.351)	-0.025	(0.966)	-0.398	(0.590)	-1.070**	(0.016)
Age 25-34	-1.456**	(0.031)	1.905	(0.125)	-1.240	(0.186)	-0.561	(0.479)
Age 35-44	2.219***	(0.001)	3.815***	(0.004)	0.316	(0.865)	-0.026	(0.982)
Age 45-54	-0.516	(0.414)	0.263	(0.910)	-1.189	(0.523)	-1.584	(0.149)
Age 55-64	0.295	(0.674)	0.304	(0.884)	3.136	(0.393)	0.133	(0.883)
Age 65+	-0.251	(0.577)	1.136	(0.186)	-1.553*	(0.058)	-0.242	(0.637)
% Agriculture & Mining	-1.146	(0.156)	0.955**	(0.038)	-0.421	(0.673)	0.866	(0.460)
% Construction	-1.267	(0.198)	0.340	(0.647)	0.386	(0.778)	1.085	(0.353)
% Manufacturing	-1.389*	(0.087)	0.027	(0.926)	-1.255	(0.250)	0.811	(0.473)
% Transportation	-1.622*	(0.064)	0.157	(0.786)	-0.704	(0.559)	0.501	(0.698)
% Trade	-1.414*	(0.082)	0.218	(0.740)	-0.840	(0.396)	0.297	(0.811)
% FIRE	-0.421	(0.658)	1.998**	(0.023)	-1.164	(0.463)	1.002	(0.407)
% Professional & Business services	-0.981	(0.256)	-0.663	(0.601)	-1.977	(0.128)	1.375	(0.264)
% Arts, Accommodation & Food services	-0.808	(0.351)	0.726	(0.665)	-1.171	(0.293)	1.896	(0.145)
% Education and Health services	-1.294	(0.125)	-0.315	(0.538)	-0.660	(0.561)	1.223	(0.296)
% Other services	-1.087	(0.193)	0.193	(0.754)	2.777*	(0.069)	0.978	(0.414)
% Public Administration	-1.627*	(0.056)	0.000	(.)	-1.151	(0.336)	0.124	(0.909)
year=1990	0.000	(.)						
year=2000	-0.110*	(0.055)						
year=2010	0.052	(0.517)						
Observations	435		145		145		145	
R-squared	0.802		0.879		0.646		0.784	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 31: Low- and High-End Ratio: Second Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q2 Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.015	(0.295)	-0.026	(0.433)	0.022	(0.325)	0.022	(0.325)
High-end Ratio	-0.062**	(0.019)	-0.113**	(0.042)	-0.056*	(0.071)	-0.056*	(0.071)
Log Income per capita	-0.194**	(0.012)	-0.329**	(0.041)	0.038	(0.728)	0.038	(0.728)
Log(Income per capita) spatial lag	-0.142*	(0.056)	-0.151	(0.314)	-0.042	(0.687)	-0.042	(0.687)
% with high school diploma	-0.254	(0.261)	0.071	(0.866)	-0.374	(0.380)	-0.374	(0.380)
% with some college	-0.343	(0.182)	-0.180	(0.734)	-0.415	(0.445)	-0.415	(0.445)
% with Bachelor's degree	0.328	(0.295)	0.469	(0.487)	-0.002	(0.997)	-0.002	(0.997)
% with Graduate degree	0.223	(0.578)	1.387	(0.123)	-0.249	(0.619)	-0.249	(0.619)
Amenity value	-0.001	(0.866)	-0.012	(0.263)	0.005	(0.682)	0.005	(0.682)
Log Population	-0.045***	(0.001)	-0.024	(0.251)	-0.034**	(0.041)	-0.034**	(0.041)
% Asian	-1.494**	(0.047)	-2.515	(0.240)	-0.244	(0.798)	-0.244	(0.798)
% Black	-0.243	(0.343)	0.279	(0.831)	-0.144	(0.795)	-0.144	(0.795)
% Native American	0.283	(0.746)	-1.530	(0.430)	0.049	(0.972)	0.049	(0.972)
% White	-0.171	(0.478)	-0.140	(0.915)	-0.030	(0.959)	-0.030	(0.959)
% Hispanic	0.141***	(0.003)	0.056	(0.939)	-0.069	(0.435)	-0.069	(0.435)
Age 16-24	-0.505	(0.149)	-0.188	(0.811)	-1.388**	(0.020)	-1.388**	(0.020)
Age 25-34	-1.896***	(0.001)	-0.252	(0.846)	-1.688*	(0.071)	-1.688*	(0.071)
Age 35-44	0.486	(0.471)	-1.080	(0.500)	-1.868	(0.253)	-1.868	(0.253)
Age 45-54	-0.808	(0.269)	2.741*	(0.077)	-2.432**	(0.028)	-2.432**	(0.028)
Age 55-64	-1.001	(0.190)	-2.276	(0.259)	-1.721	(0.109)	-1.721	(0.109)
Age 65+	-0.150	(0.780)	0.543	(0.563)	-0.640	(0.445)	-0.640	(0.445)
% Agriculture & Mining	-1.087	(0.185)	-0.071	(0.883)	-1.094	(0.414)	-1.094	(0.414)
% Construction	-0.550	(0.525)	1.013	(0.119)	-0.317	(0.831)	-0.317	(0.831)
% Manufacturing	-0.866	(0.283)	0.029	(0.941)	-1.241	(0.344)	-1.241	(0.344)
% Transportation	-0.588	(0.514)	0.099	(0.860)	-0.220	(0.886)	-0.220	(0.886)
% Trade	-0.607	(0.460)	0.145	(0.752)	-2.023	(0.139)	-2.023	(0.139)
% FIRE	-0.681	(0.435)	0.920	(0.219)	-1.058	(0.433)	-1.058	(0.433)
% Professional & Business services	-0.318	(0.711)	0.203	(0.789)	-1.602	(0.297)	-1.602	(0.297)
% Arts, Accommodation & Food services	0.239	(0.780)	2.939	(0.243)	-0.690	(0.582)	-0.690	(0.582)
% Education and Health services	-0.594	(0.461)	0.157	(0.743)	-1.030	(0.447)	-1.030	(0.447)
% Other services	-0.420	(0.694)	-0.373	(0.821)	-1.596	(0.386)	-1.596	(0.386)
% Public Administration	-0.585	(0.473)	0.000	(.)	-1.484	(0.277)	-1.484	(0.277)
year=1990	0.000	(.)						
year=2000	-0.240***	(0.000)						
year=2010	-0.166**	(0.036)						
Observations	432		144		144		144	
R-squared	0.834		0.792		0.634		0.634	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 32: Low- and High-End Ratio: Third Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q3 Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.027**	(0.018)	0.016	(0.570)	0.024*	(0.100)	0.024*	(0.100)
High-end Ratio	-0.060***	(0.006)	-0.068	(0.169)	-0.087***	(0.007)	-0.087***	(0.007)
Log Income per capita	-0.311***	(0.001)	-0.092	(0.553)	-0.122	(0.376)	-0.122	(0.376)
Log(Income per capita) spatial lag	-0.199*	(0.068)	-0.123	(0.367)	-0.265*	(0.056)	-0.265*	(0.056)
% with high school diploma	0.070	(0.754)	-0.694**	(0.046)	0.204	(0.516)	0.204	(0.516)
% with some college	-0.205	(0.431)	-0.422	(0.372)	0.341	(0.354)	0.341	(0.354)
% with Bachelor's degree	0.683**	(0.024)	0.158	(0.771)	-0.001	(0.997)	-0.001	(0.997)
% with Graduate degree	0.902**	(0.024)	-0.228	(0.767)	0.676	(0.171)	0.676	(0.171)
Amenity value	0.030***	(0.001)	0.006	(0.544)	0.005	(0.579)	0.005	(0.579)
Log Population	-0.042***	(0.004)	-0.037**	(0.035)	-0.024	(0.147)	-0.024	(0.147)
% Asian	-0.191	(0.767)	7.472***	(0.003)	0.403	(0.822)	0.403	(0.822)
% Black	-0.323	(0.155)	6.760***	(0.001)	-0.609	(0.612)	-0.609	(0.612)
% Native American	1.151	(0.556)	9.238***	(0.007)	-2.514	(0.292)	-2.514	(0.292)
% White	-0.300	(0.236)	6.951***	(0.001)	-0.631	(0.605)	-0.631	(0.605)
% Hispanic	-0.020	(0.694)	3.166***	(0.002)	-0.292	(0.681)	-0.292	(0.681)
Age 16-24	-0.393	(0.296)	-0.064	(0.927)	-0.283	(0.595)	-0.283	(0.595)
Age 25-34	-1.053**	(0.027)	0.331	(0.755)	0.218	(0.777)	0.218	(0.777)
Age 35-44	0.960	(0.251)	-0.365	(0.807)	0.546	(0.701)	0.546	(0.701)
Age 45-54	0.463	(0.410)	1.784	(0.467)	0.324	(0.697)	0.324	(0.697)
Age 55-64	-0.412	(0.673)	0.050	(0.978)	-0.719	(0.576)	-0.719	(0.576)
Age 65+	-0.107	(0.787)	-0.004	(0.996)	0.226	(0.675)	0.226	(0.675)
% Agriculture & Mining	0.434	(0.648)	0.401	(0.600)	1.073	(0.239)	1.073	(0.239)
% Construction	1.138	(0.151)	0.967**	(0.044)	0.296	(0.672)	0.296	(0.672)
% Manufacturing	0.854	(0.249)	-0.217	(0.206)	0.065	(0.921)	0.065	(0.921)
% Transportation	1.170	(0.120)	-0.645	(0.211)	0.018	(0.981)	0.018	(0.981)
% Trade	1.137	(0.154)	0.328	(0.336)	0.238	(0.752)	0.238	(0.752)
% FIRE	0.526	(0.558)	-0.305	(0.672)	-0.518	(0.530)	-0.518	(0.530)
% Professional & Business services	1.453	(0.100)	-0.650	(0.661)	2.234**	(0.049)	2.234**	(0.049)
% Arts, Accommodation & Food services	1.321*	(0.089)	3.105	(0.203)	0.549	(0.468)	0.549	(0.468)
% Education and Health services	0.540	(0.486)	-0.212	(0.651)	0.068	(0.918)	0.068	(0.918)
% Other services	1.465*	(0.089)	0.570	(0.659)	2.048	(0.111)	2.048	(0.111)
% Public Administration	0.919	(0.219)	0.000	(.)	0.048	(0.941)	0.048	(0.941)
year=1990	0.000	(.)						
year=2000	-0.121*	(0.053)						
year=2010	-0.005	(0.958)						
Observations	435		145		145		145	
R-squared	0.862		0.839		0.837		0.837	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 33: Low- and High-End Ratio: Fourth Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q4 Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.044***	(0.010)	0.015	(0.553)	0.027	(0.286)	0.003	(0.865)
High-end Ratio	-0.065***	(0.003)	-0.085	(0.162)	-0.033	(0.330)	0.002	(0.944)
Log Income per capita	-0.268***	(0.001)	-0.387**	(0.011)	-0.280**	(0.046)	0.083	(0.521)
Log(Income per capita) spatial lag	-0.191**	(0.012)	-0.114	(0.261)	-0.198**	(0.020)	-0.054	(0.503)
% with high school diploma	0.430	(0.140)	-0.301	(0.450)	-0.410	(0.307)	-0.534	(0.174)
% with some college	0.227	(0.350)	0.344	(0.460)	0.392	(0.328)	-1.138**	(0.031)
% with Bachelor's degree	0.450	(0.150)	0.057	(0.924)	-0.242	(0.546)	0.282	(0.530)
% with Graduate degree	1.558***	(0.002)	0.259	(0.834)	0.606	(0.347)	-0.893	(0.142)
Amenity value	0.010*	(0.099)	0.032**	(0.010)	0.008	(0.388)	0.005	(0.546)
Log Population	-0.013	(0.111)	-0.029*	(0.052)	0.012	(0.310)	-0.008	(0.430)
% Asian	0.124	(0.654)	0.296	(0.547)	-0.073	(0.920)	-0.112	(0.688)
% Black	-0.247	(0.232)	0.064	(0.905)	-0.220	(0.638)	-0.237	(0.307)
% Native American	0.930	(0.489)	3.636	(0.319)	0.621	(0.653)	-1.038	(0.329)
% White	-0.283	(0.177)	-0.051	(0.914)	-0.170	(0.703)	-0.150	(0.452)
% Hispanic	0.020	(0.592)	-0.080	(0.686)	-0.215	(0.257)	-0.103*	(0.091)
Age 16-24	-0.992***	(0.006)	0.237	(0.811)	-0.179	(0.763)	-0.388	(0.417)
Age 25-34	-0.253	(0.546)	0.795	(0.425)	-0.245	(0.722)	-0.099	(0.878)
Age 35-44	1.591**	(0.017)	2.276*	(0.090)	2.157*	(0.073)	-1.297	(0.336)
Age 45-54	0.105	(0.877)	3.227	(0.103)	0.090	(0.918)	-0.014	(0.990)
Age 55-64	-0.053	(0.949)	-2.744	(0.266)	0.456	(0.690)	-0.728	(0.545)
Age 65+	0.434	(0.187)	1.679**	(0.025)	0.698	(0.155)	-0.202	(0.725)
% Agriculture & Mining	-0.350	(0.717)	0.148	(0.799)	0.603	(0.556)	-2.396**	(0.026)
% Construction	0.742	(0.363)	1.985**	(0.028)	1.141	(0.102)	-0.497	(0.620)
% Manufacturing	0.057	(0.942)	0.813**	(0.024)	-0.158	(0.825)	-1.138	(0.219)
% Transportation	0.226	(0.779)	0.873*	(0.096)	-0.106	(0.891)	-0.281	(0.768)
% Trade	0.375	(0.639)	0.879	(0.170)	-0.192	(0.828)	-1.109	(0.240)
% FIRE	-0.016	(0.985)	1.544*	(0.057)	-0.163	(0.842)	-1.529	(0.146)
% Professional & Business services	0.274	(0.781)	1.726	(0.104)	0.519	(0.609)	-1.227	(0.227)
% Arts, Accommodation & Food services	0.161	(0.846)	-0.944	(0.405)	-0.180	(0.809)	-1.110	(0.206)
% Education and Health services	0.111	(0.893)	0.769	(0.144)	0.219	(0.785)	-0.968	(0.312)
% Other services	0.436	(0.593)	3.129*	(0.052)	-1.133	(0.514)	-1.282	(0.480)
% Public Administration	-0.174	(0.833)	0.000	(.)	0.151	(0.837)	-1.331	(0.129)
year=1990	0.000	(.)						
year=2000	-0.148***	(0.002)						
year=2010	-0.018	(0.770)						
Observations	438		146		146		146	
R-squared	0.873		0.806		0.862		0.832	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 34: Low- and High-End Ratio: Fifth Quintile Central Metropolitan Counties Over Time

Central Metropolitan Counties Q5 Overtime

	All Years		1990s		2000s		2010s	
Low-end Ratio	0.027**	(0.037)	0.055*	(0.099)	0.016	(0.443)	0.037*	(0.069)
High-end Ratio	0.087***	(0.001)	0.094*	(0.084)	0.046	(0.206)	0.022	(0.379)
Log Income per capita	-0.305***	(0.006)	-0.166	(0.417)	-0.375**	(0.035)	-0.260**	(0.037)
Log(Income per capita) spatial lag	-0.011	(0.597)	0.045***	(0.001)	-0.014	(0.824)	0.201***	(0.010)
% with high school diploma	1.137***	(0.000)	1.114*	(0.093)	0.102	(0.855)	0.819**	(0.036)
% with some college	0.079	(0.842)	0.247	(0.705)	0.587	(0.269)	0.151	(0.717)
% with Bachelor's degree	0.949**	(0.014)	0.966	(0.286)	0.424	(0.445)	1.647***	(0.000)
% with Graduate degree	0.678	(0.199)	0.057	(0.954)	0.948	(0.115)	-0.235	(0.671)
Amenity value	0.021**	(0.044)	0.031*	(0.085)	0.017	(0.136)	0.025**	(0.025)
Log Population	-0.015	(0.105)	-0.023**	(0.039)	0.023**	(0.019)	-0.006	(0.582)
% Asian	0.937***	(0.003)	2.019*	(0.059)	0.628	(0.269)	0.058	(0.831)
% Black	0.269	(0.133)	1.151*	(0.087)	0.976**	(0.013)	-0.080	(0.703)
% Native American	-0.978	(0.712)	-0.595	(0.933)	-2.189	(0.385)	-1.654	(0.322)
% White	0.481**	(0.021)	1.393**	(0.030)	1.114**	(0.010)	-0.034	(0.876)
% Hispanic	-0.005	(0.918)	0.305	(0.344)	0.450***	(0.003)	-0.110	(0.161)
Age 16-24	-1.502***	(0.002)	-0.162	(0.870)	0.471	(0.386)	-0.935*	(0.099)
Age 25-34	0.373	(0.388)	0.387	(0.698)	1.857***	(0.000)	1.862***	(0.000)
Age 35-44	1.410	(0.132)	3.125	(0.122)	1.067	(0.522)	-3.263**	(0.021)
Age 45-54	-3.143**	(0.018)	-0.845	(0.738)	1.148	(0.500)	3.280	(0.154)
Age 55-64	2.491*	(0.092)	1.151	(0.552)	2.463	(0.220)	-2.839	(0.326)
Age 65+	-1.374**	(0.017)	-0.258	(0.714)	0.271	(0.602)	0.162	(0.877)
% Agriculture & Mining	-0.524	(0.671)	-1.517	(0.385)	1.696*	(0.088)	0.089	(0.922)
% Construction	-1.479	(0.211)	-1.062	(0.442)	1.503**	(0.010)	0.561	(0.500)
% Manufacturing	-0.798	(0.392)	-0.275	(0.547)	0.205	(0.745)	-0.582	(0.356)
% Transportation	-0.762	(0.459)	-0.665	(0.430)	0.915	(0.131)	-0.890	(0.229)
% Trade	-0.272	(0.768)	-0.742	(0.449)	-0.503	(0.288)	-1.816**	(0.013)
% FIRE	-1.601	(0.104)	-1.509*	(0.065)	0.270	(0.676)	-1.100	(0.124)
% Professional & Business services	-0.966	(0.382)	-0.728	(0.559)	0.021	(0.981)	-0.132	(0.857)
% Arts, Accommodation & Food services	-1.313	(0.138)	-2.139	(0.103)	-0.293	(0.684)	-1.148*	(0.097)
% Education and Health services	-0.366	(0.687)	-0.348	(0.587)	-0.321	(0.761)	-0.521	(0.461)
% Other services	0.235	(0.831)	-0.069	(0.970)	0.661	(0.746)	-3.281***	(0.000)
% Public Administration	-0.392	(0.685)	0.000	(.)	0.283	(0.632)	-1.349*	(0.056)
year=1990	0.000	(.)						
year=2000	0.010	(0.930)						
year=2010	0.117	(0.382)						
Observations	426		142		142		142	
R-squared	0.761		0.820		0.867		0.852	

p-values in parentheses

Sample year: 1990 2000 2010; Models include state and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 35: Low- and High-End Ratio: County Fixed Effects, Rural, Micropolitan, and Outlying Metropolitan Counties

County Fixed Effects

	Rural		Micropo~n		Outlyin~o	
Low-end Ratio	-0.002	(0.743)	-0.008	(0.320)	0.002	(0.816)
High-end Ratio	-0.025**	(0.047)	-0.054***	(0.004)	-0.082***	(0.000)
Log Income per capita	-1.569***	(0.000)	-1.240***	(0.000)	-1.302***	(0.000)
Log(Income per capita) spatial lag	0.361*	(0.059)	0.105**	(0.047)	0.178	(0.409)
% with high school diploma	-0.198	(0.134)	-0.232	(0.183)	-0.491*	(0.062)
% with some college	-0.142	(0.459)	-0.482**	(0.030)	-0.579*	(0.090)
% with Bachelor's degree	0.273	(0.259)	0.299	(0.340)	-0.394	(0.368)
% with Graduate degree	0.078	(0.838)	-0.064	(0.892)	0.511	(0.429)
Amenity value	0.000	(.)	0.000	(.)	0.000	(.)
Log Population	-0.178***	(0.004)	-0.059	(0.191)	-0.082	(0.103)
% Asian	-1.453	(0.244)	-1.112	(0.249)	-0.614	(0.584)
% Black	-0.943***	(0.002)	-0.688**	(0.018)	-0.609	(0.173)
% Native American	0.285	(0.416)	-0.550	(0.205)	0.796	(0.124)
% White	-0.385**	(0.021)	-0.017	(0.932)	-0.278	(0.331)
% Hispanic	-0.038	(0.522)	0.009	(0.808)	-0.055	(0.495)
Age 16-24	0.675**	(0.021)	0.572	(0.124)	-0.356	(0.530)
Age 25-34	-0.439	(0.242)	-0.523	(0.264)	-1.574**	(0.031)
Age 35-44	0.269	(0.622)	-0.070	(0.888)	-0.121	(0.872)
Age 45-54	1.091**	(0.019)	0.853*	(0.064)	-0.581	(0.432)
Age 55-64	0.226	(0.666)	0.130	(0.748)	-0.898	(0.290)
Age 65+	0.594	(0.157)	0.309	(0.394)	0.720	(0.243)
% Agriculture & Mining	-0.905**	(0.033)	-0.512	(0.413)	-0.919	(0.323)
% Construction	-0.496	(0.261)	0.126	(0.854)	-0.697	(0.425)
% Manufacturing	-0.399	(0.339)	0.187	(0.766)	0.240	(0.764)
% Transportation	-0.893*	(0.063)	-0.046	(0.947)	-0.205	(0.825)
% Trade	-0.800*	(0.051)	-0.055	(0.931)	0.502	(0.550)
% FIRE	-0.637	(0.201)	0.207	(0.760)	0.832	(0.382)
% Professional & Business services	-0.590	(0.287)	0.020	(0.976)	-0.206	(0.809)
% Arts, Accommodation & Food services	-0.750*	(0.075)	-0.063	(0.923)	-0.165	(0.840)
% Education and Health services	-0.728*	(0.088)	0.230	(0.725)	0.216	(0.791)
% Other services	-0.819*	(0.053)	-0.424	(0.513)	0.140	(0.879)
% Public Administration	-0.826	(0.104)	0.424	(0.514)	0.140	(0.877)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	0.204**	(0.016)	0.159***	(0.000)	0.214**	(0.028)
year=2010	0.452***	(0.000)	0.386***	(0.000)	0.515***	(0.000)
Observations	3925		1909		1308	
R-squared	0.884		0.907		0.916	

p-values in parentheses

Sample year: 1990 2000 2010; Models include county and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01

Table 36: Low- and High-End Ratio: County Fixed Effects, Central Metropolitan Counties

Central Metropolitan Counties: County Fixed Effects

	1st Qua~e		2nd		3rd		4th		5th Qua~e	
Low-end Ratio	-0.001	(0.969)	0.004	(0.852)	0.040**	(0.045)	-0.014	(0.649)	0.020	(0.339)
High-end Ratio	-0.057	(0.106)	-0.062*	(0.080)	-0.066	(0.165)	-0.111**	(0.025)	-0.048	(0.488)
Log Income per capita	-1.395***	(0.000)	-0.928***	(0.000)	-0.926***	(0.000)	-0.856***	(0.000)	-0.785***	(0.000)
Log(Income per capita) spatial lag	0.281**	(0.049)	-0.118	(0.393)	-0.214	(0.139)	-0.131***	(0.002)	0.000	(0.997)
% with high school diploma	0.066	(0.847)	-0.317	(0.433)	-0.447	(0.370)	-0.004	(0.993)	0.784	(0.242)
% with some college	-0.703*	(0.052)	-0.101	(0.816)	-1.305**	(0.018)	-0.667	(0.216)	-1.858***	(0.000)
% with Bachelor's degree	1.054	(0.109)	-0.047	(0.953)	-0.013	(0.986)	-1.402*	(0.050)	0.022	(0.979)
% with Graduate degree	-0.472	(0.561)	-0.675	(0.448)	0.047	(0.958)	1.470	(0.131)	-0.431	(0.677)
Amenity value	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
Log Population	0.007	(0.893)	-0.058	(0.455)	-0.136**	(0.036)	-0.148**	(0.018)	-0.256***	(0.006)
% Asian	-3.370***	(0.007)	1.395	(0.161)	-0.348	(0.775)	0.008	(0.992)	0.171	(0.670)
% Black	-0.629	(0.220)	-0.450	(0.398)	-0.573	(0.191)	-1.028***	(0.007)	0.034	(0.891)
% Native American	1.526**	(0.024)	3.122	(0.229)	1.779	(0.540)	-2.230	(0.498)	-3.738	(0.311)
% White	-0.002	(0.991)	-0.226	(0.547)	-0.400	(0.291)	-0.492*	(0.086)	0.379	(0.167)
% Hispanic	-0.103**	(0.028)	0.120*	(0.099)	0.006	(0.932)	0.112**	(0.038)	0.079	(0.419)
Age 16-24	-0.267	(0.546)	0.268	(0.644)	-0.644	(0.278)	-1.706**	(0.020)	-2.521***	(0.001)
Age 25-34	-0.973	(0.190)	-1.960*	(0.070)	-0.913	(0.315)	-1.284	(0.180)	-0.477	(0.658)
Age 35-44	-0.073	(0.925)	-0.529	(0.669)	0.371	(0.717)	0.364	(0.735)	-2.276	(0.150)
Age 45-54	-0.340	(0.616)	-0.165	(0.869)	0.120	(0.902)	-0.356	(0.681)	-3.329**	(0.011)
Age 55-64	-0.603	(0.560)	-0.494	(0.618)	-0.084	(0.935)	0.875	(0.407)	-1.748	(0.189)
Age 65+	-0.451	(0.468)	0.344	(0.699)	-1.295	(0.133)	-0.687	(0.296)	-1.878**	(0.033)
% Agriculture & Mining	-0.744	(0.449)	-1.643	(0.222)	1.312	(0.323)	-0.576	(0.706)	-2.437	(0.229)
% Construction	-1.932*	(0.058)	-0.842	(0.500)	-0.772	(0.469)	-0.808	(0.456)	-2.550*	(0.058)
% Manufacturing	-0.303	(0.704)	-0.219	(0.839)	0.211	(0.805)	0.259	(0.776)	-1.045	(0.335)
% Transportation	-0.062	(0.939)	-0.820	(0.453)	0.477	(0.599)	-0.263	(0.831)	-1.070	(0.258)
% Trade	-0.925	(0.266)	-0.200	(0.857)	0.242	(0.786)	-0.093	(0.928)	0.153	(0.914)
% FIRE	0.039	(0.970)	-0.287	(0.820)	0.826	(0.431)	0.817	(0.455)	-2.059	(0.196)
% Professional & Business services	-0.528	(0.530)	-0.251	(0.831)	0.920	(0.336)	0.529	(0.629)	-0.540	(0.626)
% Arts, Accommodation & Food services	-0.240	(0.787)	0.360	(0.752)	0.838	(0.387)	0.358	(0.710)	0.697	(0.559)
% Education and Health services	-0.005	(0.995)	0.576	(0.586)	0.426	(0.639)	0.944	(0.405)	2.282	(0.106)
% Other services	-0.486	(0.582)	0.081	(0.942)	0.806	(0.357)	1.038	(0.355)	0.077	(0.931)
% Public Administration	-1.590	(0.127)	-0.688	(0.599)	0.611	(0.489)	-0.101	(0.925)	-2.459*	(0.084)
year=1990	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)	0.000	(.)
year=2000	0.160**	(0.031)	0.039	(0.624)	0.189**	(0.046)	0.067	(0.398)	0.058	(0.642)
year=2010	0.447***	(0.000)	0.220*	(0.062)	0.441***	(0.001)	0.281***	(0.003)	0.249	(0.157)
Observations	435		432		435		438		426	
R-squared	0.944		0.936		0.942		0.951		0.926	

p-values in parentheses

Sample year: 1990 2000 2010; Models include county and year fixed effects and geographically clustered standard errors.

* p<0.1, ** p<0.05, *** p<0.01