Evidence of Dynamic Geographic Shifts in Metropolitan Child Care Markets Over the 1990s

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Abstract

This paper provides an exploration of the spatial properties of the child care market. It brings attention to the accumulative impact of neighborhood structural barriers on the geographic distribution patterns of the child care market. In this context, three major questions are addressed: 1) What is the level of access that families have to their neighborhood child care options and is there variation by race, 2) Has access changed over the last decade?, and 3) If it has, what caused the change over the 1990s? Using both the Economic Census and the U.S. Census this research offers a methodology for estimating relative access to formal child care options using the dissimilarity index. Results indicate that nationally the supply of formal child care options within metropolitan areas has improved over the decade and there is significant variation in improvement for residents when race is considered. Generally, improvement in child care access is a result of dynamic metropolitan shifts; that is, new entrants and movement of existing child care facilities to poor access neighborhoods occurred within metropolitan areas over the period between 1990 and 2000.

Introduction

The heightened importance of child care is evident by recent growth in the number of scholarly works, yet, rarely has a scholar explored the child care market in spatial terms. Undoubtedly, geographic imbalance of the child care market across neighborhoods imposes certain costs, and generally, the larger the imbalances the higher the costs imposed on families. How child care is distributed geographically determines the distances families must travel and the amount of time it will take to commute to

International Journal of Economic Development
Volume Nine, Number 3, pp. 159-204
2007

work. Parents' daily routines link together the geographies of child care, home, and work and seldom do these geographies overlap (England 1996a, 1996b). In most cases, difficulty finding a child care provider renders work or school participation problematic (Boushey 2002).

Given the importance of geography, especially in sprawling metropolitan landscapes, it is critical that a scholarly discussion ensue focused on three major questions. What is the level of access that families have to their neighborhood child care options? Has access changed over the last decade, and is the change greater for certain groups? And if any change is evident, what caused the change over the 1990s? This discussion is particularly necessary since as a work support, millions of families depend on child care services.

Demand for child care has escalated persistently over the last five decades. Dating back to 1947, it was unusual to find the mother of a preschool-aged child in the labor force; only 12 percent[2] of mothers with children under the age of six were in the labor force (U.S. House Ways and Means 1998). Yet, by 2002, more than 71 percent of single mothers, 60.8 percent married mothers and 77.9 percent of widowed, divorced or separated mothers with preschool-aged children participated in the labor force (U.S. Census 2003). Combined with the growing necessity for families with young children to consist of two bread winners, these trends have intensified concerns about access to child care and the importance of gauging relative access over time.

Nevertheless, before access can be gauged one needs relatively standard measures that also take into consideration spatial distribution to systematically gauge child care access across the nation. Hence, this research

offers a methodology for estimating relative access to formal child care options within neighborhoods across metropolitan areas in the U.S. looking to the dissimilarity index; a measure of geographic population distribution often employed by urban sociologists to gauge segregation. The equation for the dissimilarity index allows consideration of the distribution of neighborhood child care supply enumerated over the entire metropolitan area. This measure is suggestive of how much reshuffling across neighborhoods is necessary to render the metropolitan area child care supply relatively balanced between demand and supply. Further interpretation of this measure is discussed throughout the paper.

Using the Economic Census and the U.S. Census, this paper will track access to child care over the 1990s and attempt to identify reasons for any changes that are exhibited. The data included in the analysis are limited because they do not include informal options, school-based programs such as pre-kindergarten, or small licensed family establishments. Although the data only allow a systematic exploration of child care centers within metropolitan areas, exploring the child care market in this way will begin to illuminate market inefficiencies. This will allow the establishment of benchmarks whereby supply and access can be gauged while also making it possible to effectively target resources that may stimulate market growth, especially in those places with extremely sparse supply. The extant literature on child care cost and quality is rich; however, much more needs to be understood about the national supply of child care and metropolitan dynamics responsible for its spatial distribution across neighborhoods.

Literature Review

In this section, three areas of the literature will be discussed. First, a review of important structural components of metropolitan areas potentially influential over the child care market is shared. Second, the status of child care policy at the national level is presented focusing particularly on recent changes in the nation's welfare policy. Last, it explores past efforts and new ways to measure access to child care services.

Structural Barriers to Access

Less affluent neighborhoods who consistently confront blight and a stagnant local economy may present barriers to both the demand and supply of child care. As Ficano (2006:454,455) suggests these barriers might include a lack of adequate transportation, low levels of human capital, linguistic isolation, and geographic dispersion. But the "spatial mismatch" literature indicates that the barriers may be more extensive and may have more detrimental effects than Ficano (2006) attests. The body of work provided by Kain (1968), Massey and Denton (1986, 1993), Orfield (1995) and Fernandez (1997) documents how the effects of racial segregation and the polarization of the poor within central cities is significantly related to differences in the distribution of key community resources (decent housing and quality public schools) and decreased employment opportunities; arguably barriers that significantly explain persistently high unemployment rates and low wages of inner city minority residents.

Generally, the community's economic viability determines the amenities that neighborhoods have to offer, which in turn impact the overall desirability of the neighborhood. Thus, with regards to the child care market,

the amenities or disamenities could potentially cause child care establishments to enter into the market in a particular community, remain in the neighborhood, or relocate into another neighborhood.

Despite the harsh effects that structural barriers could have on the child care market, metropolitan regions across the U.S. enjoyed economic prosperity during the 1990s and child care access improved over this period. During this period, unemployment rates dropped considerably. For example, as a result of the economic boom, unemployment by 2000 was at an all time low. In 1999, the black unemployment rate was 8 percent (Office of the President 2001:Table B-42). While this was nearly double the national unemployment rate, the annual rate of 8 percent is the lowest recorded value for black unemployment rates since the Bureau of Labor Statistics began to collect separate data for African Americans in 1972.

The noticeable increase in prosperity, especially for blacks and other disadvantaged groups occurred as urban job growth which may have generated economic vitality and commercial activity in areas that once were neglected. Additionally, the growth could have raised the incomes of the poor and other marginalized groups, possibly spurring their residential mobility to the suburbs where jobs and economic growth is relatively stable (Raphael and Stoll 2002).

On the other hand, as argued by Stoll (2006), as metropolitan areas across the U.S. became simultaneously characterized by residential and job sprawl, distances between important “daily trip” nodes increased leading to further isolation of people within the region from important economic opportunities.

These arguments suggest that the viability of the neighborhood may influence the child care market. Reports indicate that when compared with economically viable communities, distressed neighborhoods have a significantly lower supply of licensed-center care (Gordon and Chase-Lansdale 2001; Queralt and Witte 1998; Fuller et al. 2002). It appears that large chain for-profit child care providers prefer site locations near: major highways, locations between middle-class residential areas and commercial areas, communities with high female labor force participation rates, and traditional two-parent families with two-wage earners and more than 50 percent above the median family income (Kahn and Kamerman 1987:105). Some have attempted to explore the supply of child care and the community features that seem to determine supply (Queralt and Witte 1999; Collins and Li 1997; and Kreader, Piecyk and Collins 2000), but few have done so systematically across the nation (Ficano 2006) and none have explicitly considered race. However, public policy has the ability to mediate the influence of economic and social features of communities and the structural barriers that may dominate the metropolitan region overall.

Recent Federal Child Care Policy

Major changes in welfare policy over the 1990s created an environment which demands that every "able bodied" adult even if they have young children work (Loprest 2002). This policy stance precipitated heightened pressures on child care demand mainly stimulated by increased labor force participation among low-income mothers (Ficano 2006).

The U.S. federal government has responded to the increase in child care demand in several ways. Authorized

by the Child Care and Development Block Grant (CCDBG) Act, the Child Care and Development Fund (CCDF) operates as a single integrated subsidy program which provides resources to States, Territories, and Tribes for child care assistance and quality improvement activities. This program assists low-income families, families receiving temporary public assistance, and those transitioning from public assistance in obtaining child care so they can work or attend training/education (Child Care Bureau 2006). Subsidized child care services are available to eligible families through certificates (vouchers) or contracts with providers.

The welfare program,Temporary Assistance to Needy Families (TANF), created by the passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 has been the largest source of increase in federal child care funding. Under the CCDBG rules, states can transfer a portion (up to 30%) of TANF dollars to the CCDF, or spend TANF directly for child care. Child care has accounted for the single biggest redirection of TANF funds (Cohen 2001, 4). Use of TANF for child care in fiscal year 2001 reached $3.7 billion.[3]

Given the expansion of child care subsidies, it is important to understand how the infusion of federal funding affects community access to child care (Child Care Bulletin 1996). To date, research which most closely addresses this question explores how supply, measured as individuals reporting employment in child care industries by county, is affected by child care policy changes (Ficano 2006). The evidence from this study suggests that an increase in child care subsidies and changes in tax policy benefiting middle-income families contribute significantly to an expansion in child care at the county level, but there appear to be mixed

effects in urban and rural areas (Ficano 2006). Clearly, new child care dollars infused into the market has a direct impact on child care supply, but even with this evidence it is ambiguous as to whether this expansion has lead to greater geographic accessibility. To be sure, however, gauging accessibility is not possible without a standardized measure of child care access. The following sections entertain ways to achieve a standard measure.

Gauging Child Care Access

Tracking child care supply nationally is tremendously difficult. Various state and local agencies produce directories of child care providers, and child care resource and referral (CCR&R) agencies assist parents in an effort to decrease child care search costs (NACCRRA 2002; Bellm 1991). However, the diversity of services and multiple sponsors cause an inconsistent, non-uniform collection of child care data for the formal market, and although there is some state and local collection of data on the informal market, a systematic national collection of data on the informal sector is nonexistent (Jacobson et al. 2001; Kahn and Kamerman 1987:4; NACCRRA 2002).

Commonly, child care supply is indexed to the community's child population (Queralt and Witte 1998, 1999). Various researchers manage to estimate child care capacity using data supplied by CCR&R agencies. Some academics and practitioners who attempt to explain child care supply suggest using the number of child care slots available in a given age group as an estimate of child care capacity (Fuller et al. 2002; Jacobson et al. 2001; Queralt and Witte 1998).

Specifically, a number of studies use children aged zero to five years as the denominator in calculating

capacity levels of child care for communities (Fuller et al. 2002; Jacobson et al. 2001). The number of "slots per tot" is reportedly a good benchmark for practitioners to judge the adequacy of the child care supply (Queralt and Witte 1998). However, when pockets of local CCR&R data are unavailable, obtaining an accurate computation of "slots per tots" across the nation is almost impossible. Furthermore, despite the rich data that CCR&R agencies provide, not all local agencies track child care providers. The compilation of child care resources from these data sources is likely to render a spotty national inventory of child care options. It is not clear how much of Head Start is captured within CCR&R data. Since it is the responsibility of state departments of education to ensure the safety of Head Start centers these data may not be included in databases of child care licensed by state child care service agencies (Morgan and LeMoine 2004:3). Head Start programs are major suppliers of child care; they reportedly serve over 800,000 low-income children annually (GAO 2000:8). Thus, failing to systematically include Head Start data seriously underestimates child care supply for low-income families, in particular.

Other researchers have chosen to estimate child care in other ways. Casper and O'Connell (1998) in a U.S. Census Bureau document reported estimating child care businesses from the Census of Service Industries (CSI) data. Ficano's (2006) recent research also utilized the CSI data to track the growth of employment in the child care industry at the county level. This research set-out to detect how sensitive child care employment was to changes in child care policy. Within these data, child care businesses are classified as establishments primarily engaged in the care of infants or children or in the education of prekindergartners. These establishments do not include babysitting services nor do they include Head Start centers

operating in conjunction with district elementary schools. Head Start centers affiliated with district elementary schools come under the classification of education in the Census of Service Industry data. According to the U.S. Head Start Bureau (1999), approximately 29 percent of Head Start programs are administered in public elementary schools.

Additionally, a growing body of literature focused on measuring the size and economic importance of child care within a regional economy relies on linking CCR&R data, state licensing data, government finance and tax data, as well as education data (Warner, Ribeiro and Smith 2003:303). While these data can provide a greater mix of formal and informal child care supply, there remains the inability to systematically disaggregate the data by geographical units small enough to represent communities or neighborhoods. These data would require analysis at much larger geographical units than what is desired for this paper.

New Methods to Gauge Access to Child Care

The prevailing method by which access is described is child care capacity (number of slots available). Despite its usefulness, alone it provides a limited view because it does not provide information about access to actual facilities or account for geographical unevenness. Neighborhood by neighborhood, access to a child care facility is of primary importance even before a household can consider the number of slots available within facility.

Moreover, examining the number of child care slots alone does not allow one to tell the more complicated story about how the child care market is behaving within a metropolitan-wide system. Additionally, for the purpose of

understanding how to promote a more pareto-efficient[4] child care market where quality child care options are more equitably distributed across communities regardless of affluence and race, it is useful to discuss the implications of metropolitan-wide economic and structural shifts on access to child care.

To explore these shifts and their impact on the child care market, a measure is required that provides a deeper understanding of the relative accessibility of child care as determined by the totality of structural barriers (such as: lack of adequate transportation, low levels of human capital, linguistic isolation, decentralization of jobs among other features) that characterize individual neighborhoods within the region. Currently, no child care measure exists that captures nationally the geographical unevenness of neighborhood child care supply within metropolitan-wide systems.

Scholars have employed various indices to understand the level of interaction or segregation in populations. The dissimilarity index, isolation index, exposure index, and entropy index are all measures of population distribution. [5] There are many strengths and weaknesses of the indices, some of which will be explored below (White 1986). The dissimilarity index is the most notable measure and has been used to measure segregation for decades (Sorensen, Taeuber and Hollingsworth 1975). Massey and Denton (1986) employed the dissimilarity index to highlight levels of housing segregation. Richard (2001) and Raphael and Stoll (2002) used the dissimilarity index to capture a different relationship - the jobs-to-people mismatch. This body of literature provides guidance on the development of a new child care access measure.

The dissimilarity index appears to be a better tool mainly because it captures population unevenness with regard to geography more directly than any of the other indices (White 1986). Because sociologists and urban economists have consistently measured segregation and job isolation using this measure, there is an opportunity to compare child care access measures to other segregation and job isolation measures. Additionally, the measure is easy to interpret. As the measure approaches 0, integration is perfect and as it approaches 100, there is perfect segregation.

These indices provide a standardized measure of neighborhood access to child care across regions so comparisons between metropolitan areas can be made. Access to neighborhood child care services in the Los Angeles metropolitan region could be compared to access to neighborhood child care supply in the Chicago region. The limitations of such a measure stem from the inability to explicitly incorporate distance measures, as well as the inability to account for the distribution of families and child care facilities in contiguous neighborhoods. Nevertheless, measuring child care systematically in this way would expand understanding of the dynamic child care market. Further, it would allow a baseline to be established from which changes in child care access can be gauged overtime.

METHODS

Data

The data presented in this report are drawn from two primary data sources: the 1990, 2000 U.S. Census and the 1997, 2002 U.S. Census Bureau's Economic Census files. The U.S. Census provides data on demographic information about families, the number of families within

each zip code as well as those within metropolitan statistical areas (MSA).[6] Child care facility data by zip code and metropolitan area is obtained from the Economic Census file. Using both of these data sources measures of the degree of spatial mismatch between families with young children less than five-years old and locations of formal child care facilities are constructed for the 314 metropolitan areas included in this study.

Data from the 1997 and 2002 Economic Census are published primarily on the basis of the North American Industry Classification System (NAICS), unlike earlier censuses, which were published according to the Standard Industrial Classification (SIC) system. Child care establishments for this study are found within the Health Care and Social Assistance sector. Included in this sector is a subset - child day care, equivalent to North American Industrial Classification System (NAICS) code 6244. This industry comprises establishments primarily engaged in providing day care of infants or children who report revenues and business expenses to the Internal Revenue Services and also employ at least one worker. These establishments generally care for preschool age children, but may care for older children when they are not in school and may also offer prekindergarten educational programs. These data are collected using a mail-out questionnaire to all establishments of multi-unit firms and single-establishment employers with annualized payroll above a size cutoff (cutoffs vary by industry, but include all employers with 10 or more employees) receive a census form (U.S. Census Bureau 2002). However, a sample of small firms also receives a census form and is selected using a stratified sample.

Although a large percentage of children are cared for in unlicensed and licensed home care facilities where

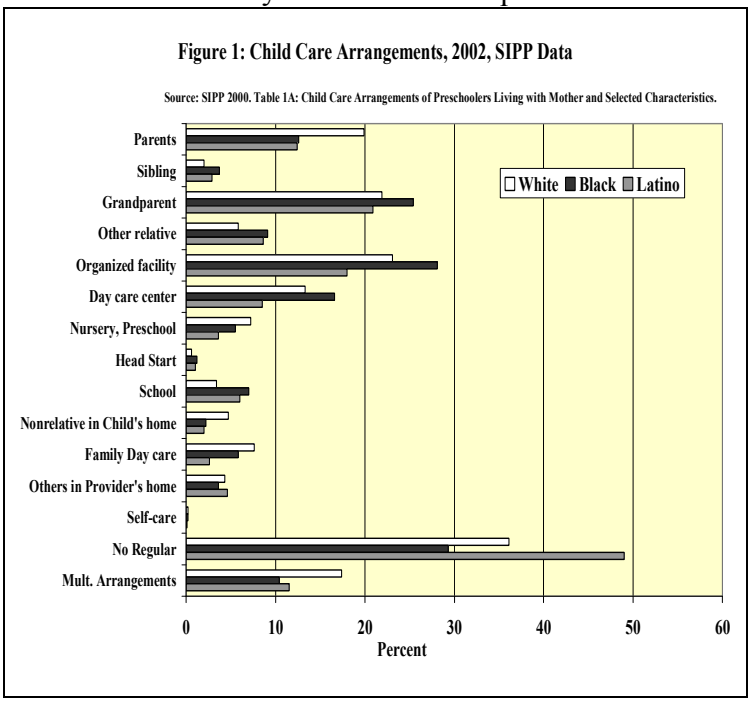
there are no employees, these types of establishments are not included in the analysis.[7] The data included are facilities with at least one employ, chiefly organized facilities, daycare centers, nursery – preschools and about 70 percent of Head Starts (see Figure 1, it provides a visual of the percent of families who use these arrangements).

The data present several limitations. First, the child care spatial mismatch measure used in this study may overstate the imbalance between the residential location of low-income families and neighborhood child care options because low-income families are more likely to utilize unlicensed relative care, neighbor and licensed home care (Brown-Lyons, Robertson, and Layzer 2001; U.S. Child Care Bureau 2002) - the data segment missing from this analysis. Second, it is possible that communities that have a concentrated minority or low-income population have a lower perceived demand for formal child care due to their historical reliance on extended kinship networks for child care, thus a greater mismatch may be observed than is actual (See Figure 1). Lastly, for nonminority middle to high-income families, exclusion of nanny or employer-sponsored child care not captured in the data sources mentioned above may cause the analysis to overstate the spatial mismatch measure; these options act as alternatives to licensed child care. As the data are analyzed these limitations will be considered.

Construction of the Child Care Spatial Mismatch Variable

To calculate the indices, data on total family population is measured at the zip code level from the 1990 and 2000 Census of Population and Housing and child care facility data at the zip code level from the 1997 and 2002 Economic Census. The dissimilarity measure is adopted to

describe the level of geographical accessibility families have to formal child care options near their neighborhoods for each of the 314 Metropolitan Statistical Areas (MSA) included in this analysis. The actual equation for the



dissimilarity index is quite straightforward. Define $Family_i$ as the number of families with children who are less than 5 years old residing in ZIP code i (where i=(1,...,n) and indexes the ZIP codes in a given metropolitan area), $CCFacility_i$ as the number of child care facilities in ZIP code i, *Family* as the total family population having children younger than age 5 in the metropolitan area, and *CCFacility* as the total number of facilities in the metropolitan area. The dissimilarity score between families

and child care facilities is given by applying the following equation:

$$(1) \qquad D = \frac{1}{2}\sum_i \left| \frac{Family_i}{Family} - \frac{CCFacility_i}{CCFacility} \right|$$

The dissimilarity index ranges between 0 (perfect balance) and 1 (perfect imbalance). The actual numerical value of the dissimilarity index has a convenient interpretation; multiplying this figure by 100 permits one to interpret the index values as the percentage of either of the populations that would have to move across zip codes to yield perfect balance. For this study, dissimilarity indices are computed for all U.S. metropolitan areas for the years 1990 and 2000 over four population groups: for all families, white families, black families and Latino families with young children under the age five. To further understand how the child care market reacts in dynamic metropolitan-wide regions, a methodology is utilized to explore a decomposition of the major change components within the child care market overtime.

Decomposition of Average Change in the Dissimilarity Scores, Within-Metropolitan Area Improvements or Between-Metropolitan Area Population Movements

To discern the forces within the metropolitan regions' urban economy chiefly responsible for shifts in child care mismatch indices over the 1990s this study undertakes an analysis of change components attributable to within-metropolitan area improvements and between-metropolitan area migration in the following manner. Define w_i^{90} as the proportion of the 1990 family population with preschool age children residing in metropolitan area *i*, w_i^{2000} as the proportion of the 2000 family population with preschool age children in metropolitan area *i*, I_i^{1990} as the

child care facility/family dissimilarity index value for metropolitan area *i* in 1990, and I_i^{2000} as the child care facility/family dissimilarity index value for metropolitan area *i* in 2000. The weighted averages of the indices for 1990 and 2000 are given by

(2) $$\mu_{1990} = \sum_i w_i^{1990} I_i^{1990}, \mu_{2000} = \sum_i w_i^{2000} I_i^{2000},$$

respectively. The change in the average value over the decade is given by the equation

(3) $$Change = \sum_i (w_i^{2000} I_i^{2000} - w_i^{1990} I_i^{1990}).$$

To decompose the change into the components discussed above, one needs to add and subtract the term $w_i^{2000} I_i^{1990}$ within the parentheses of the change equation. Factoring this equation yields the decomposition of the change,

(4)

$$Change = \sum_i [w_i^{2000} (I_i^{2000} - I_i^{1990}) + I_i^{1990} (w_i^{2000} - w_i^{1990})]$$

The first term in this equation gives the weighted average of the change in the indices using the 2000 family population distribution as a weighting variable. This term gives the portion of the change driven by within-metropolitan area changes in the index values. The second term provides an estimate of the impact of the change in the weights (--i.e., the distribution of families with preschool age children across metropolitan areas) on the overall average index using the 1990 index values to calculate the contribution. This second term is the component of the change that is attributable to inter-metropolitan area migration of all families and repeated for black and Latino families.[8]

(5)

$$Change = \sum_i [w_i^{1990} (I_i^{2000} - I_i^{1990}) + I_i^{2000} (w_i^{2000} - w_i^{1990})],$$

The following section includes a descriptive presentation of spatial mismatch for MSAs and provides an explanation of the metropolitan-wide change components responsible for the shifts in relative access to child care. Policy implications are briefly discussed in the final section of the paper.

RESULTS

Data Description

There are approximately 330 Metropolitan Statistical Areas (MSAs) in the nation, 314 are included in this analysis (about 16 MSAs within the New England Region drop out because of the awkward distinction of the township classifications) (U.S. Census Bureau 2000). Table 1 provides a basic description of MSAs in the sample. On average, across all MSAs included in the analysis, 11 percent of the population is black and 10 percent is Latino. Among all 314 MSAs, on average, 17 percent of the population is college graduates. Regarding regional representation, 10 percent of all MSAs included in the analysis are in the Northeast, 30 percent are in the Midwest, 40 percent are in the South and 18 percent are in the West.

Overall the sample is highly urbanized. On average, 78 percent of the population in MSAs within the sample is urbanized. Of the urbanized population, on average 71 percent reside in suburban parts of MSAs included in this analysis. Outside of the urbanized area, on average 21 percent of the population in MSAs reside in rural areas. With regards to size, there are approximately 249 people per square mile and the average land area for MSAs included in the sample is 2,311 square miles.

Table 1. Descriptive Statistics N=314 Metropolitan Statistical Areas		
Variables	**Mean**	**Std. Deviation**
% Black	11.4	10.6
% Latino	10.0	15.2
% College Graduates	16.8	5.1
# of Families	16,966.9	28935.1
# of White Families	10,490.2	15351.5
# of Black Families	2,445.1	5564.7
# of Latino Families	2,825.9	8821.4
% Pop. Urbanized	78.0	11.9
% Pop. Rural	21.0	11.9
% Pop. Suburban	71.0	16.3
City Age	169.3	52.5
Northeast	10.0	-
Midwest	30.9	-
South	40.2	-
West	18.9	-
People Per Sqr. Mile	249.5	186.6
Land Area	2,311.5	3122.6
% Service Sector Jobs	42.7	5.1
# child care facilities 2002	163.9	252.1
# child care facilities 1997	106.6	156.3

Change in Child Care Access Over the 1990s

Table 2 presents average values for child care spatial mismatch in 1990 and 2000 – the dissimilarity score for all families and by race. There are two strong patterns in the data. First, over the 1990s, families were significantly less spatially segregated from child care establishments, with the exception of white families. For example, in 2000, on average, the dissimilarity score (families-to-child care index) for white families was 54.05 percent, that is 54.05 percent of white families or child care facilities needed to

relocate to render their spatial distribution relatively accessible to that of the distribution of child care facilities, compared with an index value of about 50.14 percent in 1990, an increase of about 4.47 percentage points over the 1990s.

Table 2. Child Care Mismatch for Families by Race/Ethnicity Over the 1990s, U.S. Metropolitan Areas*

	1990	2000
All Families**	49.17	43.67
White	50.14	54.05
Black	92.55	82.03
Latino	83.89	76.08

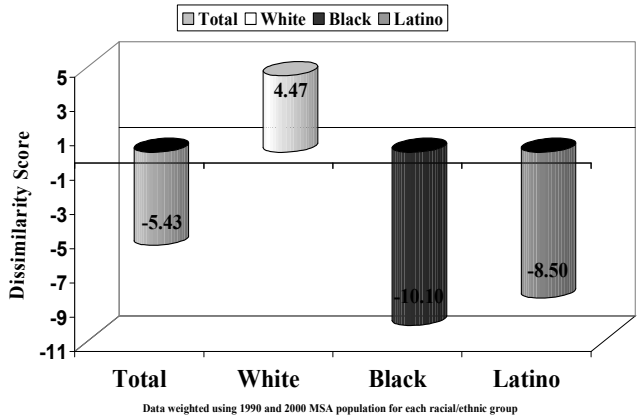
*Data weighted using 1990 and 2000 population counts by MSA for each racial/ethnic group.
**The Average mismatch for All Families reflects the mean for all families including segments excluded from the detailed analysis (i.e. Asian and Native American families).

Second, race and ethnic differences in relative access to child care establishments are also evident in Table 2, with blacks worse off and Latinos following slightly behind. Despite these results, blacks' and Latinos' access to child care facilities improved most dramatically over the 1990s. These improvements suggest that important features connected to the child care market were altered. Most notable, between 1992 and 1997 there was an approximate 20.9 percent jump in child care establishments and from 1992 to 2002, the country witnessed a 34.7 percent increase in the number of child care facilities (U.S. Census Bureau 1992, 1997, 2002) (see Table 3). Factors that potentially contributed to improvement in child care access included blacks' mobility to areas with greater child care supply, and new facilities entering the child care market. See Figure 2.

Table 3: Child Care Establishments Reported by the Economic Census*			
	Child Care Firms	**Taxable**	**Nontaxable**
1992	51,297	35,327	15,970
1997	62,054	43,955	18,099
2002	69,128	44,896	24,231
	Change Score		
1992-1997	20.9%		
1992-2002	34.7%		

Source: U.S. Census Bureau, Economic Census 1992, 1997, 2002
*all firms have at least 1 employee

Figure 2: Average Change in Child Care Mismatch Over the 1990s



Although blacks reside in metropolitan areas with the poorest access to child care options in 2000, from 1990 to 2000 they witnessed larger increases in child care access than did families of other racial groups. The total index for blacks on average declined by 10.10 percentage points over the 1990s (dropped 8.50 for Latinos), while the index increased 4.47 percentage points for white families. On

average, the gap in relative access to child care between white and black families narrowed by nearly 34 percent over the decade.

Ironically, despite having the greatest access to child care options over the 1990s, white families were the only group in this study to experience slight decreases, access to child care declined by 5.43 percentage points. This aberration signals a shift in the child care availability or in their population distribution, perhaps as a result of increased mobility which could have spurred movement even beyond suburban boundaries. Although this is not the relationship under investigation within this study, it is plausible that the movement of whites further from the urban center of the metropolitan region is causing slight decreases in access, but only initially, until economic activity shifts closer to these white residential neighborhoods over time. Evidence from Martin (2001, 2004) suggests that the movement of whites precedes the movement of jobs; jobs usually follow whites' residential patterns and away from blacks. If this is true, it is likely that other urban economic activities such as the proliferation of formal child care centers also follow this path. These relationships should be explored in subsequent research.

Regional Variation in Child Care Access

Table 4 displays weighted child care facilities/families mismatch measures for each race by region and the change over the 1990s. Seemingly, regardless of race, child care access for families residing within metropolitan areas in the Northeast, Midwest, South, and West is relatively identical spanning from 42.32 percent mismatch in the South to the greatest mismatch in the Northeast at 45.64 percent, a mere 3.32 percentage

point difference. However, significant variation in child care access by region becomes evident once race of the family is considered.

Table 4: Metropolitan Area Child Care Mismatch By Region		
	2000	**Change Score 1990 – 2000**
Northeast		
Total Families	44.56	-8.39
White	60.59	6.01
Black	93.26	-6.55
Latino	90.60	-2.88
Midwest		
Total Families	45.64	-6.66
White	54.04	1.36
Black	95.50	-3.59
Latino	95.18	-1.60
South		
Total Families	42.32	-1.07
White	57.01	8.99
Black	70.73	-14.68
Latino	67.86	-3.31
West		
Total Families	42.99	-6.40
White	49.61	2.96
Black	84.67	-12.71
Latino	71.26	-14.21

In 2000 black families in the Midwest were exposed to the greatest child care imbalance, over 95 percent of black families or child care facilities across MSAs in this region have to relocate to another zip code for child care to be more evenly distributed and accessible to families. Similarly, black families in the Northeast experience great imbalances (93.26%). Access to child care for black families in the West and the South is much improved, the greatest access for black families is found in the South where 70 percent of black families would have to move

between zip codes in MSAs in the region to bring about balance.

As with black families, Latino families are similarly isolated from child care options within their neighborhoods. Latino families in the Midwest are most isolated from child care options. Over 95 percent of these families need to move to another zip code within MSAs across the region to render child care accessible, while Latino families residing in the South and West are least isolated.

Over the decade, changes in child care accessibility for families vary significantly by region. Regionally, improvements in child care access were exhibited for all families, on average, with the smallest increases (-1.07) observed in the South and the greatest increases (-8.39) occurring in the Northeast, 6.66 percentage point increase in the Midwest and 6.40 increase in the West.

The change score exhibited in Table 4 provides evidence that dynamic shifts in the child care market on average, have taken place across metropolitan areas for minority families in particular. Of all the groups, blacks in the South compared to their counterparts in other regions were the best off regarding access. Black families' dissimilarity score by the end of the decade was 70.73 percentage points, indicating nearly a 15 percent improvement in child care accessibility over the decade. Nevertheless, in the South, Latinos and blacks still exhibit the poorest access to child care options as compared to white families. Inversely, of all the regions, whites in the South were worse off and on average, white families' access to child care worsened by 8.99 percentage points.

Latino families in the West fair best. Likewise, on average, Latino families witnessed the largest increases to

child care access at 14.21 percentage points. Although black families remain worse off in the West; on average they experienced a 12.71 percentage point improvement in access to child care options over the 1990s.

The poor access to child care options by minority families is consistently evident. The patterns illuminate how regional differences in the child care market and racial composition interrelate impacting geographical balance between minority residential locations and the distribution of child care establishments. Other relationships are important to explore, it is probable that access to child care also varies greatly by the concentration of poverty within MSAs.

As suggested by Wilson (1987), Massey and Denton (1993) and Jargowsky (1997), neighborhoods with a high concentration of poverty are confronted with a dynamic problem of job decentralization, high levels of residential segregation and lack of access to economic opportunity. Cumulative effects of these characteristics often challenge access to quality public services. Table 5 displays child care access with regards to the level of concentrated poverty within the metropolitan area.

Unlike Jargowsky's (1997) work that identified neighborhoods that were 40 percent or more impoverished to represent concentrated poverty neighborhoods, for this analysis MSAs that are double[9] the average poverty rate are identified. This was necessary because MSAs are much bigger than neighborhoods and thus limiting the cutoff at 40 percent would cause the sample size to be too small to observe variation. Hence, a smaller measure of poverty concentration is used to disaggregate high poverty from moderate poverty MSAs. Table 5 displays spatial mismatch measures for families by race in MSAs with a high poverty

population (24 percent or greater) or MSAs with moderate to low (less than 24 percent) poverty population using the Census definition of poverty in 1990 and 2000.

Table 5: Child Care Mismatch by Percent Poor of the MSA		
	2000	**Change Score 1990 - 2000**
All MSAs Where Poverty > = 24% (High Poverty)		
Total Families	34.45	-8.96
White	47.32	4.01
Black	59.14	-15.08
Latino	43.74	-10.69
All MSAs Where Poverty < 24% (Moderate to Low Poverty)		
Total Families	43.93	-5.40
White	54.19	3.87
Black	82.56	-10.35
Latino	78.11	-7.76
MSAs > = 24% Poverty, N=24; MSAs < 24% Poverty, N=290		
Data weighted using 1990 and 2000 MSA population counts		

In 2000, on average, child care access across MSAs double the average poverty rate was relatively robust at 34.45 percent. As for the remainder of the moderate to low poverty MSAs, child care options were an estimated10 percentage points more isolated, indicating that about 44 percent of families in these MSAs need to move between zip codes to improve their access. Overall, given that low-income families are more likely to utilize unlicensed, informal child care (not captured in this study) one would expect child care mismatch measures to be greater overall in MSAs with uncharacteristically high poverty rates, thus inflating the accessibility measure.

Focusing on MSAs with a large poverty population (>=24%) shows a vast variation in child care access by the race of the family. For example, on average, blacks' access to child care across the 24 high poverty MSAs included in this group is 59.14 percent in 2000, a difference of 23.42 percentage points from the average child care access measure for black families in moderate to low poverty MSAs. Also, while black families in high poverty MSAs experienced a 15.08 percent change score indicating a large improvement in child care access over the decade, white families did not experience an improvement but a slight decrease in child care accessibility. It also appears that Latinos residing in high poverty MSAs are on average 34.37 percentage points better off than their Latino counterpoints in moderate to low poverty MSAs. Access to child care shifted by over 10 percent over this period for Latino families residing in high poverty MSAs compared to only 7 percent in low poverty MSAs.

These findings are somewhat counter intuitive; it was expected that both black and Latino child care access would be least adequate in high poverty MSAs. It might be the case that federal and state child care policy has had an impact in the poorest neighborhoods within the MSA. During the period under investigation significant increases in child care funding occurred. These results provide evidence that significant increases in subsidy spending within a relatively short period in high poverty areas with low child care access is responsible for overall improvement in child care access. Additionally, it might also be the case that MSAs facing high levels of poverty are more urban, therefore are characteristic of more robust business activity and commercial agglomeration in spite of the poverty present. Ficano's (2006:465) work certainly supports part of this story; she shows that child care funding increases positively affects poor families; a $1,000

increase in funding per child in poverty is associated with an increase of 0.005 workers per child under age 6.

Despite having overall extremely poor access to child care, the greatest increases in relative access to child care over the 1990s occurred for black and Latino families. Up to this point, the data provide a basic picture of the status of child care access across the nation; however, clues to why these declines are occurring are less clear. To illuminate the causes of the increased access to child care the remainder of the analysis will focus on the improved access experienced by black and Latino families.

Reasons for Improved Child Care Access Over the 1990s

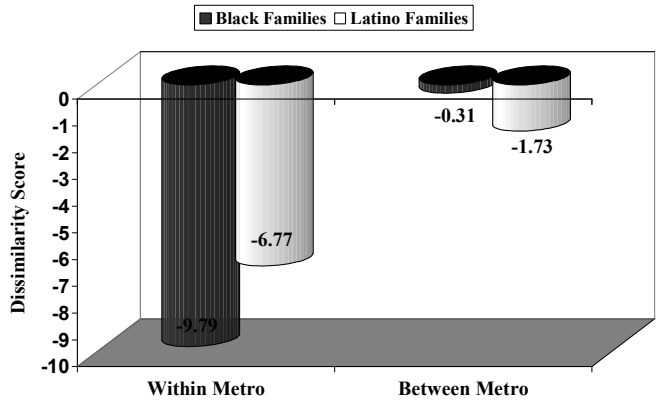
A central question that emerges from this analysis is what factors are responsible for the increase in child care access by black and Latino families over the 1990s. These factors can be classified into two broad categories: within metropolitan area and between metropolitan factors. Between metropolitan factors refer to migration patterns of families across metropolitan areas. Declines in mismatch indices for families over the 1990s could be driven by blacks and Latinos moving from low access to high access metropolitan areas. Alternatively, declines in mismatch could be due to child care establishment location changes (additions) that occur within metropolitan areas.

In this section, the spatial mismatch indices are decomposed into component parts to determine whether between or within metropolitan changes account for more of the decline in blacks' and Latinos' family child care mismatch observed over the 1990s. Figure 3 presents the results of the decomposition for the indices that changed by statistically significant amounts in the 1990s – child care

accessibility for black and Latino families. To interpret these data, the total contribution is identified, in percentage points, of either between-metro or within-metro residential shifts to the total increase in child care accessibility over the 1990s.

The decomposition results in Figure 3 indicate that for black families, 9.79 percentage points of the 10.10 percentage point increase in access (shown in Figure 2) observed over the 1990s is due to within metropolitan area changes. Similarly, for Latino families, 6.77 percentage points of the 8.50 percentage point increase in their access observed over the 1990s is due to within metropolitan area changes. Thus, without exception, the analysis indicates that the significant improvements in access to child care options for black and Latino families over the 1990s is largely attributable to within metropolitan area changes rather than between metropolitan movement of black and Latino families. Thus, these improvements were not the result of blacks migrating from low access to high access metro areas, but to within metropolitan area changes.

Figure 3. Causes of Improvement for Black and Latino Families Over the 1990s, U.S. Metropolitan Areas 1990 to 2000



Data weighted using 1990 and 2000 MSA population for each racial/ethnic group

The next critical question is given that nearly all of the improvement over the 1990s in child care accessibility for black and Latino families is due to within metropolitan area changes, what factors are responsible? The next section addresses this question.

Residential Mobility or Child Care Establishment Movement?

There are two main within metropolitan area changes that can drive this improvement. The first is changes in locations of child care establishments (including the entrance of additional establishments into the market) occurring within metropolitan areas. It could be that the economic prosperity of the 1990s and the increased spending on federal and state policies geared toward providing subsidies to families that cannot afford the market rate of child care may have led to the growth of child care establishments. This would include the transition of informal establishments into the formal sector in neighborhoods where black and Latinos families live. This phenomenon would improve the balance between where black and Latino families reside and where child care establishments are located.

The second possibility is that these families could move within metropolitan areas to neighborhoods where more child care exists. In this scenario, it could be that black and Latino households suburbanized to a greater extent during the 1990s, or more generally, tended to move where child care establishments and other economic activity tends to locate. Such movement would cause improvements in the mismatch between residential locations of black and Latino families and child care options.

To address the question of which within metropolitan area factor drove most of the improvement in access over the 1990s, two hypothetical indices are computed. When compared to the actual values for 1990 and 2000, these hypothetical indices allow one to discern the forces driving the within-area reductions in mismatch. Both indices, along with actual values for 1990 and 2000, are displayed in Table 6.

The first hypothetical mismatch measure uses 1990 population data and 2000 child care establishment data. It can be interpreted as measuring the imbalance between people and child care establishments that would have resulted if black families had not moved to the extent that they did during the 1990s, while child care establishments underwent their actual change over the course of the decade. This hypothetical index captures whether child care firm movements drove the within metropolitan area changes.

The second hypothetical mismatch measure uses 2000 population data and 1990 child care data. It can be interpreted as the level of spatial imbalance between child care firms and families that would have resulted had the geographical distribution of child care options not changed during the 1990s, while family population distributions underwent their actual change during the decade. This hypothetical index captures whether residential mobility drove the within metropolitan area changes.

The data presented in Table 6 indicate that child care establishment mobility drove the within metropolitan area changes in the mismatch indices. In fact, the hypothetical index for child care establishment movement for both black and Latino families most closely matches the actual 2000 mismatch index for these groups. On the other

hand, the hypothetical index for population movement for both black and Latino families most closely matches the actual 1990 index for blacks in particular. This indicates that over the 1990s, child care establishments moved towards black and Latino families perhaps with the entrance of new formal establishments in locations where blacks and Latino families reside. These data suggest that declines in child care mismatch for black families, in particular, were in fact not a result of shifts in residential movement but shifts in establishment movement over the 1990s. The data show that in the absence of child care establishment mobility for black families specifically access to child care would have been further aggravated by nearly 7 percentage points.

Table 6. Contribution of Residential Movement and Child Care Facility Movement to Declines in Mismatch between Black and Latino Families, U.S. Metropolitan Areas, 1990 to 2000

TOTAL FAMILIES	**Black**	**Latino**
Actual 1990 mismatch index	92.55	83.89
Hypothetical index assuming population distribution did not change (child care establishment movement)	**85.54**	**75.51**
Hypothetical index assuming child care establishments did not move (population movement)	92.00	79.35
Actual 2000 mismatch index	82.03	76.08

Overall, these data provide evidence that nearly all of the reduction in the average mismatch between where black families reside and where child care establishments are located (to a lesser extent for Latino families) was driven by within metropolitan area improvement during the last decade. Moreover, entrance of new child care establishments and movement of existing establishments

drove most of the within metropolitan area improvement, and not family movement to child care rich clusters.

Conclusion

Nationally the supply of formal child care options within metropolitan areas has improved over the decade. Data representing the most recent period from 1992 to 2002 revealed nearly a 35 percent increase in formal supply alone. Nontaxable or nonprofit operated child care facilities grew at a greater rate than taxable child care facilities suggesting that the entrance and movement of child care facilities operated by community groups and local churches are, in part, responsible for the improvement that blacks and Latinos experienced over the decade. Undoubtedly, the increase in supply contributed to slight improvements in the extent of spatial access families have to formal child care options within their neighborhoods.

Although access to child care options remains inferior for black and Latino families, most of the improvement over the 1990s was realized by these families. This improvement, primarily due to within metropolitan shifts, is a result of child care establishments moving to or the entrance of new establishments into low access neighborhoods as opposed to the increased mobility of residents to child care rich neighborhoods.

This research also provides evidence that white families in their residential neighborhoods in both 1990 and 2000 continue to have the greatest access to child care options. For example, in 1990 a 42.41 percentage point difference between access for whites and blacks was exhibited and in 2000 nearly a 28 percentage point difference was exhibited. These dissimilarity scores indicate that during 1990, on average, it was necessary for

42 percent more black families or child care establishments within the average MSA to relocate to another zip code within the metropolitan area to bring about complete integration of black families with child care options. While it is clear that, on average, white families are better off in respect to access to child care relatively close to their neighborhoods, over the decade it appears that access has slightly declined. This trend is not dramatic; but should be tracked overtime for it has great implications to the geography of the child care market.

Arguably these trends are highly correlated with the level of residential mobility of white families and secondarily to the movement of jobs. The movement of affluent white families tends to precede the movement of jobs and jobs move toward white families and away from black families (Martin 2001, 2004). Mobility trends indicate that whites are moving further from the urban center of metropolitan regions potentially causing slight decreases in access to neighborhood child care options over the decade, but only initially, until economic activity shifts closer to white residential neighborhoods that are developing well beyond the urban fringe.

One of the most striking findings is that child care establishment mobility is chiefly responsible for the improvement in child care access among black and Latino families. This finding supports the evidence that major federal efforts to address the cost of child care to low-income households and tax credits for middle income families have significantly impacted the number of new child care firms entering the market (Ficona 2006). Moreover, this finding signals a need for better collaboration with local economic development agents and those responsible for planning for the availability of important public services.

Given the impact of federal and state policy on the child care market, it would be most beneficial if state and county level officials and planning boards collaborate with regards to management of the CCDF in a way to increase the entrance of new formal establishments in communities that have the most difficulty with growing their supply of quality facilities. Often child care is a missing part of regional efforts to plan for community services important to the efficient operation of communities. In most states, local planners are not obligated by law to plan for child care (Anderson 2006). Neglecting to plan for the efficient distribution of child care services through the development of housing, business complexes, transportation networks and sports complexes is a practice that will ultimately compromise the productivity of the entire workforce of large metropolitan regions.

Planning for child care should be viewed as an economic development strategy for it provides a critical service to parents who work while also creating a great number of jobs within local communities (Warner and Liu 2006). For most working families, accessing convenient, affordable child care is a daily necessity more important than shopping, banking, or recreation (Anderson 2006).

Various states have realized the importance of collaborating with local planning entities to ensure there is adequate local child care options. For example, in California Local Child Care Planning Councils were created in each county. These councils are authorized to determine local child care needs and prioritize where new child care subsidy funds should be used. With increased funding coming to states and local communities after welfare reform in 1996, this state and local role has become more important. Arguably, child care planning has grown more crucial for all other states but not all states have set up

an infrastructure to manage these important federal resources in ways that allow communities to ensure that the supply of quality child care options are smartly distributed. In the short-term it is important for every state to implement a planning council such as the one that has been implemented in California to be involved in all local child care planning initiatives. Although development of planning councils is laudable, it is important that child care planning cross into other important sectors such as: small business development corporations, transportation planning boards, housing authorities and other land development projects.

There are tools available for innovation regarding mixing transportation development projects with child care services. As a part of the 1998 transportation legislation, the Job Access and Reverse Commute (JARC) program originated with passage of the Federal Transportation Efficiency Act for the 21st Century (TEA-21). The program is administered by the Federal Transit Administration (FTA), provides grants to communities for the purpose of filling gaps in employment transportation (FTA 2007). Generally, program users are low-income families and former welfare recipients who otherwise would have a difficult time traveling to and from employment and other important daily trip nodes such as child care, school, shopping and employment training (CTAA 2007).

Over the next five years (2005-2009) $727 million is authorized for spending (CTAA 2007). Through regional bodies at the state level local entities can seek grant support from JARC funding. In the past, this funding has enabled innovative transportation projects, in fact, a few local agencies placed centers within reach as parents made daily node trip changes. For example, with JARC grants, the

Chattanooga Area Regional Transportation Authority contracts with Special Transit Services to provide demand-response transit service to two day care facilities and to schools. Vans are equipped with on-board monitors to protect young children traveling to and from day care without parents. After 2 years in operation, CARTA Planning Director reports that CARTA has made well over 34,000 child passenger trips to and from day care facilities. Innovative ideas such as this are important, especially given that the CCDF does not have any real mechanism to influence the supply of child care in a targeted fashion.

Through partnerships with transit agencies, metropolitan planning organizations, and community based organizations the establishment of child care services could be targeted in locations that maximize access. It is critical that subsequent versions of the federal transportation bill continue to support these kinds of innovations. Ultimately, collaboration is important; child care services should be viewed as public service infrastructure as are water, power and sewage services.

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ENDNOTES

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[2] It is likely that the percent of women in the workforce in 1947 does not accurately reflect the rate at which African-American women worked as domestic workers and in the agricultural industry in the South, see Phyllis Palmer's (1990) account of black domestics during the depression.

[3] Taken from tables prepared by the U.S. Department of Health and Human Services, Administration for Children and Families, TANF Program Federal Awards, Transfers and Expenditures, 1997-2001.

[4] A redistribution of child care services, in this case geographically, to communities who are worse off without making all other communities any worse off. See Weimer and Vining (1992) for a detailed discussion about pareto-efficient distribution in other policy contexts.

[5] The isolation index and exposure index are segregation measures in population distribution, as is the dissimilarity index (U.S. Census Bureau 2000). The strength of the exposure index is also its limitation. It is more effective at acquiring a sense of social reality because it accurately describes the social experiences of group members in different populations, but does not sufficiently measure unevenness (White 1986). The entropy index measures the diversity of a certain place. It considers the relationship of diversity for the entire population with the weighted average of the parcel-specific diversity.

[6] The metropolitan areas used in the analysis are Metropolitan Statistical Areas (MSAs) and Primary Metropolitan Statistical Areas (PMSAs) as defined by the Office of Management and Budget (OMB) in 1999 for Census 2000. Consolidated Metropolitan Statistical Areas (CMSAs), which are usually much larger than MSAs or PMSAs, were not included among these metropolitan areas.

[7] According to the U.S. Census Bureau, 2002 Nonemployer Economic Census, there are an estimated 633,000 total child care establishments of which over 90 percent (618,000) are establishments that report expenses but do not report paying employees.

[8] An alternative decomposition would add and subtract $w_i^{1990} I_i^{2000}$ to the original expression for the change in the index value. After factoring, this would yield the

decomposition where again, the first term is the component driven by within-area improvements in the index and the second term is the component driven by between-area migration. These two decompositions may differ slightly depending on the average changes in the index values and the distribution of the changes in weights. To account for these differences, decompositions in the analysis are based on the average of these two equations (as is the convention). Specifically, the estimate of the within-area improvement component is calculated by computing both decompositions (given by Equations (4) and the alternative to 4 discussed above) and taking the average of the first terms from the two equations. The estimate of the between-area contribution to the improvement is calculated by taking the average of the second terms from the two equations. Since both decompositions yield very similar results, conclusions are not sensitive to the averaging or the choice of decomposition.

[9] In 2001, on average in the United States, the poverty rate was an estimated 11.7 percent.