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WHAT EXPLAINS CENTRAL CITY PERFORMANCE?

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INTRODUCTION AND METHODOLOGY

The fundamental question we address is: What accounts for urban performance? By urban performance we mean change over time in important indicators of urban well-being such as income, jobs, crime rate, housing affordability, etc. Change in these indicators might result from several factors, including 1) structural factors that were present at the beginning of the period and predispose the city indicators to change in a predictable way (economic structure, skill level of the population)[1], 2) exogenous changes that occurred during the period (natural disasters, immigration, new state or federal policies), and 3) endogenous changes that occurred during the period (city policy, behavior of private and public-sector elites). In the popular writing (and often in public policy literature as well), urban performance is frequently attributed largely to explicit policy decisions of local (and/or state) public officials or civic elites. We wish to examine this attribution in the context of other factors that might also affect performance.

We proceeded as follows. We broadly defined urban performance to be the change in a wide array of economic and social indicators of the well-being of city residents between 1990 and 2000. Our population of cities included all central cities with populations of more than 50,000 in 1990 (n=325). We collected data on 27 indicators of the economic and social well-being of city residents. These included measures of income (per capita and median household), educational

[1] It might seem that the obvious response to this would be to simply include these other structural factors in the model. However, in some cases this could not be done because data were not available. In other cases, inclusion was impractical. It may be that a city performed well because the metropolitan area in which it was lodged was heavily concentrated in a four digit SIC code sector that performed particularly well nationally over the period. However, it was simply impractical to include employment at each of the large number of four digit sectors as part of our models.

attainment, crime rates (both murder and larceny rates), housing costs (median home values and rents as well as housing affordability), racial and economic segregation, poverty (rates and concentration), and employment. (See Appendix 1, Table 1 for a list of indicators and their definitions.) We were interested in the *change* in city performance, so all the indicators measured change from 1990 to 2000. Using a method we first developed for an earlier project[2], we used factor analysis to condense our indicators of city and residential well-being into categories representing broad areas of performance.

In order to estimate the maximum possible variation in the categories of urban performance that could be attributed to public policy, we used linear regression to explain the portion of the variation that could *not* be attributed to policy (or at least recent policy). The cities' factor scores were the dependent variables in the predictive models, and a set of variables measuring changes in cities' social and economic structures were the independent variables. (See Appendix 1, Table 3 for a list of independent variables.) We controlled for city characteristics at the beginning of the study period by including measures of these characteristics in 1990 in addition to the change from 1990 to 2000. We thus attempted to explain as much of the variation in the factor scores as possible using this set of non-policy variables. The remaining, or unexplained, portion of the variation is the maximum portion that might be attributed to policy at the national, state, or city levels.

Because we were interested in the effects of both state and local policy, we wished to identify states whose cities as a whole performed much better or much worse than our model predicted. To identify these states we used state fixed-effects models to separate state-level policy effects from those that may occur at the national or city levels. We regressed the residuals from the three predictive models against a set of state dummy variables to identify states whose coefficient on the dummy variable was significant. Based on these models, we chose seven states in which to conduct case studies of state policy effects on city performance. These states were: California, Michigan and Pennsylvania, where cities generally underperformed our model's expectations, and Illinois, North Carolina, Oregon, and Washington, where cities

[2] Furdell, Kimberly, Harold Wolman, and Edward W. Hill. 2005. Did central cities come back? Which one, how far, and why? *Journal of Urban Affairs*, 27, 3, 283-305.

generally outperformed our model's expectations. We chose two cities in each state (except for Oregon, where we chose only one) to study based largely on whether the cities' performance in over or under performing our model's expectations mirrored the overall performance of all the cities in the state. The cities were: Sacramento and San Francisco, CA; Aurora and Chicago, IL; Grand Rapids and Lansing, MI; Charlotte and Durham, NC; Portland, OR; Philadelphia and Pittsburgh, PA; and Seattle and Tacoma, WA.

Because factor analysis is difficult to interpret in terms of explaining policy, we next ran a parallel set of regression models using the highly-loading variables in each factor as dependent variables. These eight variables were change from 1990 to 2000 in: median household income, per capita income, poverty rate, population, employment, jobs by place of work (the only MSA level model), and housing affordability at both the 30 percent level (households paying more than 30% of their income for housing) and the 50 percent level (households paying more than 50% of their income for housing). On the basis of our initial interviews, we slightly modified the individual models to account for more non-policy related factors and improve the models' predictive powers. As with the original models, these were meant to be predictive and not structural, allowing us to discount the obvious problems of multicollinearity in the interest of maximizing the models' predictive abilities.

The result was separate models for each of several indicators to explain change between 1990-2000, using 1990 starting conditions of the indicator, structural characteristics of the city as of 1990, and changes in these structural characteristics between 1990-2000. We then once again examined the residuals from these models – cities whose performance was far off the regression line for each of the indicators and for which performance thus could not be explained either by path dependency or by the structural variables that were part of the model. The unexpected change in performance indicators must then have resulted from structural variables not included in the model, by exogenous change between 1990-2000, or by city or state public policy or actions taken by non-public sector city actors during that decade. (See Appendix 1 for a complete description of the methodology.)

To sort out the effects of these other factors we undertook case studies of the 13 cities designated above. We examined relevant documents and conducted interviews in these cities and in the state capitals of the seven states. The case studies provided us both with qualitative and quantitative data relevant to those cities and states.

Using both the quantitative analysis and the case studies, we then set out to try to explain the performance of the cities on three important indicators (income change, population change, and change in housing affordability) and, in particular, why the performance change deviated so greatly from the model predictions. We first set forth a series of hypotheses about the processes that could logically have brought about the change (deviation from the regression line. (See Appendix 2 for the complete list of hypotheses.) For those that the data supported, we ask why the processes occurred. Finally, we focus particularly on the role of state and city policy in bringing about city performance on that indicator.

We examine each of the hypotheses using the full set of data at our command. These data include information from the original regression on what kind of change our model predicted as well as data, both quantitative and qualitative, from our case studies. In many if not most cases, a rigorous test of our hypotheses would require panel data that tracked individuals and families over time that do not exist. The ideal dataset would look at the well being of people with different characteristics in terms of education, sex, family characteristics, and occupation and track their economic progress over time. We would then be able to determine if the residents of a particular city were better or worse off over the course of the decade. Because panel data do not exist, we cannot make inferences about the economic progress of residents. We can only make statements about the average performance of the city over time, unless qualitative data can be brought to bear through the case studies. We are aware of the ecological fallacy, interpreting aggregate data as if it applies to all members of a population, and restrict our interpretations of the results to the aggregate measures.

So the obvious two questions to ask are: What kinds of data would bear on our hypotheses and How can these data be employed to come to conclusions about them? We start with the caveat that we are not going to be able to provide rigorous tests of our hypotheses. Instead we construct

logic models, which are logical arguments about what processes would have to have occurred for the hypotheses to be true. We bring together available data that might bear upon those arguments, make inferences from data that do exist, ask whether the data are consistent with the process having occurred, and come to an informed judgment about whether or not the hypothesis is supported.

BACKGROUND

The predicted and actual changes in population, per capita income, and housing affordability for our 13 case-study cities are set forth in Appendix 3 (see tables 1-4). The predicted change is the change predicted by our model. (See Appendix 1 for a more complete description of the methodology, including the models.) The actual change is what, in fact, did occur. Our goal is to explain in a qualitative fashion the difference between the predicted and actual changes, i.e., what accounts for the unexpected deviations from our model over the decade of the 1990s.

In Charlotte, for example, our model predicted a population increase of 24.6% between 1990 and 2000, whereas actual population increased by 36.6%. By contrast, our model predicted a loss of population of 3.8% in Pittsburgh, while the actual decline was 9.6%. In terms of per capita income increases, our model predicted an increase of 56.2% for San Francisco compared to an actual increase of 75.5%. It predicted an increase of 51.6% for Grand Rapids, while the actual increase was only 46.3%.

There were some general groupings of our 13 cities across the three indicators we examined. Of the five cities whose population growth was substantially greater than predicted by our model, four (Aurora, Charlotte, Durham, and San Francisco) also had income growth substantially higher than predicted. All three cities whose population growth was lower than expected by our model (Lansing, Pittsburgh and Sacramento) also had lower income growth than predicted. Of the four cities where housing affordability worsened, three (Aurora, Seattle, and Tacoma) experienced greater than expected income gains and the fourth (Portland) experienced greater than expected population gain. Of the five cities that had improvements in housing affordability, four (Grand Rapids, Lansing, Philadelphia, and Sacramento) had substantially lower than expected population increases. (See Appendix 4, tables 5-7.)

While the three indicators of central city performance are obviously intertwined, we treat each separately, albeit with inevitable overlap. We begin with population change.

POPULATION CHANGE

Five of our case-study cities registered population increases substantially greater (by at least five percentage points) than predicted by our model (see table 1 below). Aurora, Charlotte and Durham all experienced very large actual increases – above 36% in each case – while Portland and San Francisco experienced more modest actual increases. The difference between predicted and actual increases was much greater in the first three cases than in the latter two. Those cities that experienced actual population losses (or that grew less than expected) did not have as large differences between predicted and actual values, ranging from Pittsburgh, with a loss of -9.5% rather than the predicted loss of -3.9% to Sacramento, which only grew 10% rather than the predicted growth rate of 22%.

Table 1: Actual and Predicted Population and Change

	Actual Values*				
City	Population, 1990	Population, 2000	Percent Change in Population (1990-2000)	Predicted Change in Population (1990-2000)	Difference Between Actual and Predicted Change
Aurora	99,581	142,990	43.6	18.9	24.7
Charlotte	395,934	540,828	36.6	23.3	13.3
Chicago	2,783,276	2,896,016	4.0	3.6	0.5
Durham	136,611	187,035	36.9	21.8	15.1
Grand Rapids	189,126	197,800	4.6	3.6	1.0
Lansing	127,321	119,128	-6.4	0.4	-6.8
Philadelphia	1,585,577	1,517,550	-4.3	-5.7	1.4
Pittsburgh	369,879	334,563	-9.5	-3.9	-5.7
Portland	437,319	529,121	21.0	14.9	6.1
Sacramento	369,365	407,018	10.2	22.5	-12.3
San Francisco	723,959	776,733	7.3	0.0	7.3
Seattle	516,259	563,374	9.1	7.2	1.9
Tacoma	176,664	193,556	9.6	7.0	2.6
U.S. all principal cities	92,798,041	102,397,410	10.3		

*Source: State of the Cities Data System. Accessed at http://socds.huduser.org/Census/Census_Home.html

City population changes can occur through a variety of processes: net natural increase (the difference between births and deaths of the population residing in the city); net domestic migration (the difference between in-migration of residents to the city from other parts of the United States and out-migration of residents from the city); immigration from abroad; and city annexation of suburban land and the population residing on it. Which of these processes occurred in the cities that experienced substantially greater than expected population increases?

Components of Population Change

Net natural increase: Differential fertility rates can reflect the demographic, ethnic, and religious composition of the population. Unfortunately, we are unable to find data on birth and death rates by city. Pittsburgh, for example, which had major population losses had a decline in its fertility rate from 61.6 per 1000 in 1990 to 52.6 per 1000 in 2000, a decline of 14.6%[3], while the national fertility rate was declining from 70.9 to 67.5 per thousand, a decline of only 4.5%). Sacramento County, which contains Sacramento, experienced a decrease in fertility rates from 74.3 per 1000 in 1990 to 68.8 per 1000 in 2000, remaining above the national rate[4]; however, we are not able to isolate the rate in the city of Sacramento. San Francisco similarly experienced a decrease in fertility rates (from about 73 per 1000 in 1990 to 66 per 1000 in 2000, with rates as low as 54 per 1000 during that decade) despite its increase in population[5], suggesting that natural increase was not the primary factor in its population growth. Chicago's population growth of 4% was close to that predicted by the model, 3.6%; however, much of that growth is attributed to the high fertility rates of the city's Hispanic population[6]. In North Carolina, both Charlotte's Mecklenburg County and Durham County experienced fertility rate upsurges, from 66.0 to 71.0

[3] Allegheny County Birth Statistics Report Year: 2000, Allegheny County Health Department, Biostatistics Office, May 2002, Table C-2.
[4] http://www.communitycouncil.org/level-4/regtables/regfiles/Health.xls accessed November 19, 2006.
[5] Blash, Lisel, Holley Shafer, Monique Nakagawa, and September Jarrett (Sept. 2005). *Getting Behind the Headlines: Families Leaving San Francisco*. Public Research Institute, San Francisco State University, from Figure 2, p. 2.
[6] Johnson, Kenneth M. (April 2002). *The changing face of Chicago: Demographic trends in the 1990s.* The Federal Reserve Bank of Chicago. Accessed at http://www.luc.edu/depts/sociology/johnson/fedletter.pdf.

and from 62.3 to 65.7 respectively, again due to Hispanic immigration increases. The general population fertility rate for the year 2000 was 67.5, whereas the Hispanic rate was 107.7[7].

Domestic in-migration: Of the five cities whose actual population increase exceeded that of our model, four - Aurora, Charlotte, Durham, and Portland - had rates of domestic in-migration between 1995 and 2000 greater than 25% of their 1990 population, while the fifth – San Francisco – had a rate equal to 20% (the average increase for our 13 cities was 23.4% of 1990 population and the median was 21.3%, compared to the national average of domestic movers from another county or state of 18.1%[8]). Most of the in-migration to Aurora came from other places within its metropolitan area, while the vast majority in the other four cities came from outside of their metropolitan areas (see table 2).

Table 2: Migration into City in 2000*

	Percentage of Population in 2000 over age 5 that moved to a house in the target city from:					
Target city	Another central city or suburb in target city's metro area		Somewhere in the U.S. other than the target city's metro area		Abroad	
	Percentage of 2000 Population	As a percentage of 1990 population	Percentage of 2000 Population	As a percentage of 1990 population	Percentage of 2000 Population	As a percentage of 1990 population
Aurora	18.9%	24.4%	11.4%	14.7%	5.3%	7.6%
Charlotte	3.4%	4.4%	23.0%	29.3%	4.4%	6.1%
Chicago	4.1%	3.9%	6.3%	6.1%	4.9%	5.1%
Durham	7.1%	9.0%	23.5%	29.9%	5.5%	7.6%
Grand Rapids	8.8%	8.4%	13.3%	12.8%	4.4%	4.6%
Lansing	10.2%	8.7%	13.2%	11.4%	2.5%	2.4%
Philadelphia	3.1%	2.8%	6.4%	5.7%	2.6%	2.5%
Pittsburgh	7.3%	6.3%	11.1%	9.5%	2.5%	2.2%
Portland	7.5%	8.5%	15.8%	18.0%	3.9%	4.7%
Sacramento	5.2%	5.3%	14.2%	14.6%	3.4%	3.8%
San Francisco	2.3%	2.4%	17.1%	17.6%	6.3%	6.8%
Seattle	7.2%	7.5%	19.0%	19.8%	4.5%	4.9%
Tacoma	7.9%	8.1%	18.0%	18.3%	3.2%	3.6%

[7] U.S. national Center for Health Statistics, National Vital Statistics Reports, Vol. 50, Number 5, "Births: Final Data for 2000," February 12, 2002, Table 6. Live births, birth rates, and fertility rates by Hispanic origin of mother, and by race for mothers of Non-Hispanic origin: United States, 1989-2000, p. 33

[8] Census Brief: Geographic Mobility, 1995 to 2000. September 2003. Accessed at http://www.census.gov/prod/2003pubs/c2kbr-28.pdf.

*Source: U.S. Bureau of Census, 2000 Census Summary File 3 - Sample Data: Tables P25. "Residence in 1995 for the Population 5 Years and Over" --MSA/PMSA LEVEL [35] - Universe: Population 5 years and over and PCT21. "Residence in 1995 for the Population 5 Years and Over" --STATE, COUNTY, AND PLACE LEVEL [24] - Universe: Population 5 years and over.

Foreign immigration: Several of the cities had very substantial increases in immigration from abroad (see table 3). Charlotte's foreign born population increased from 15,119 in 1990 (4% of its population) to 59,849 in 2000 (11% of its population), a 296% increase compared to its 1990 foreign born population. Durham experienced the same trend, albeit on a much smaller scale. Its foreign born residents increased from 5,205 in 1990 (4% of its population) to nearly 23,000 in 2000 (12% of its population). In addition, a recent study by the Kenan-Flagler Business School estimated that 45% of North Carolina's Hispanic population was undocumented[9]. From this report's finding, we could infer that there was a Census undercount on the immigration numbers, since undocumented aliens are less likely to respond to census takers.

Aurora experienced similarly explosive gains in immigrants, from 11,944 in 1990 (12% of its 1990 population) to 30,858 in 2000 (22% of its 2000 population). Portland's relative increase was more moderate: the number of foreign born residents more than doubled from 1990 to 2000 from 33,601 (8% of its 1990 population) to 68,976 (13% of its 2000 population).

San Francisco presents a somewhat anomalous case. Its 1990 foreign born population was 246,000 or 34% of its total population, the highest of any of our cities. However, the number of foreign immigrants between 1995 and 2000 actually declined compared to the year 1985 to 1990, and the percentage of foreign born population increased by only 16% (39,507 people) between 1990 and 2000. [10]

Foreign-migration was critical to Chicago's population growth during the decade. Foreign-born individuals constituted 16.9% of its population in 1990, but 21.7% by 2000. However, this

[9] Kasarda, John D. and James H. Johnson, Jr. (January 2006). *The Economic Impact of the Hispanic Population on the State of North Carolina*. Kenan-Flagler Business School, UNC Chapel Hill. Hawkins Kenan Institute of Private Enterprise, Kenan-Flagler Business School, p 9.

[10] While San Francisco's population growth was greater than expected by the model, the model did not control for Asians as a minority, only Blacks and Hispanics, which may have affected the results in San Francisco, where 20% of the population in 1990 was in the category of "other races, not Hispanic."

meant an increase of 159,716 foreign born individuals from 469,187 in 1990 to 628,903 in 2000. Indeed, data from the Chicago Federal Reserve indicates that the increase in Chicago's population was completely a result of immigrants, primarily from Mexico, both due to their migration to Chicago and their high fertility rate once in Chicago.[11]

Overall immigration, both foreign and domestic, between 1995-2000 exceeded 30% of 1990 population in Aurora, Charlotte, Durham, Portland, and Seattle (all but Seattle were cities in which population growth exceeded the model's predictions.) The importance of in-migration to a city's population growth is evidenced by Pittsburgh, the city in our sample with the greatest population loss. An analysis from Carnegie Mellon's Center for Economic Development, using census data from 1985-1990 and IRS migration data from 1998 -1999, found that Pittsburgh's out-migration is less than that of similar "rustbelt" regions; lack of in-migration was the main cause of Pittsburgh's declining population[12]. Philadelphia and Lansing, which also experienced population loss during the decade, had lower than average in-migration from both domestic and foreign sources.

[11] Johnson, Kenneth M. (April 2002). *The changing face of Chicago: Demographic trends in the 1990s.* The Federal Reserve Bank of Chicago. Accessed at: http://www.luc.edu/depts/sociology/johnson/fedletter.pdf.
[12] Bob Gradeck (Sept. 2000) *Are young people really fleeing the Pittsburgh region in droves*?

Table 3: Change in Foreign Born Population*

City	Foreign Born 1990	% of 1990 Population	Foreign Born 2000	% of 2000 Population	Change in Foreign Born (1990-2000)	Percent Change (1990-2000)
Durham	5,205	4	22,544	12	17,339	333.1%
Charlotte	15,119	4	59,849	11	44,730	295.8%
Grand Rapids	7,456	4	20,814	11	13,358	179.2%
Aurora	11,944	12	30,858	22	18,914	158.4%
Portland	33,601	8	68,976	13	35,375	105.3%
Lansing	3,999	3	7,071	6	3,072	76.8%
Tacoma	13,621	8	23,047	12	9,426	69.2%
Sacramento	50,569	14	82,616	20	32,047	63.4%
Seattle	67,736	13	94,952	17	27,216	40.2%
Chicago	469,187	17	628,903	22	159,716	34.0%
Philadelphia	104,814	7	137,205	9	32,391	30.9%
San Francisco	246,034	34	285,541	37	39,507	16.1%
Pittsburgh	16,946	5	18,874	6	1,928	11.4%
U.S.	19,767,316		31,107,889		11,340,573	57.4%

*Source: State of the Cities Data System. Accessed at http://socds.huduser.org/Census/Census_Home.html

Annexation: Charlotte gained substantial population through annexation between 1990 and 2000 as a result of North Carolina's laws that make it easy for a city to annex territory outside of its borders. Between 1990 and 2000 Charlotte annexed 66.8 square miles (a 39% increase) and added 82,981 residents (21.0% of its 1990 total). This population figure was a pre-annexation estimate of population made at the time of the annexation petition, but it would have grown about 17% by the annexation's effective date 11 months later.[13] Durham operates under the same laws and annexed 25.38 square miles, increasing its territory by 37%, between 1990 and 2000.[14] However, these annexations had a negligible impact on Durham's population at the time of annexation because of Durham's policy of annexing land only at the request of developers, with such land being minimally inhabited at the time of annexation.[15] "Population growth in the annexed areas has typically occurred following annexation," according to the city.

[13] Data and estimate provided by Jonathan Wells, AICP, Capital Facilities Program Manager, Charlotte-Mecklenburg Planning Commission, , email communication, October 17, 2006.
[14] 2003 Chapel Hill Data Book. Accessed on November 18, 2006, at http://www.ci.chapel-hill.nc.us/DocumentView.asp?DID=922
[15] Data provided by Laura Woods, Senior Planner, Durham City-County Planning Department, email communication, November 2 and November 7, 2006.

City population increases due to annexation are a direct result of state annexation and incorporation laws. Charlotte's annexation activities were possible because North Carolina law makes it easy for a city to annex land and difficult for individuals on land outside of an existing city to incorporate.[16] North Carolina cities can annex surrounding unincorporated territory without the consent of the property owners residing in the area being annexed. Annexation requirements include minimum density qualifications, contiguous boundary and land use specifications, the ability of the city to extend services, and the territory's unincorporated status. North Carolina couples easy annexation laws with laws that new make municipal incorporations difficult. An area seeking to incorporate must be able to offer four of several basic services (police, fire, solid waste protection, water distribution, street maintenance, street construction, street lighting, and zoning) and to levy a property tax of at least five mils within three years of incorporation. Furthermore, it cannot incorporate if it is within five miles of a city of more than 50,000 without the permission of that city.

Summary: Increases in population in Charlotte and Durham occurred primarily as a result of in-migration, both foreign and domestic, and, in Charlotte's case, annexation contributed directly to population growth. Portland's increase resulted primarily from domestic in-migration, San Francisco's from foreign immigration, and Aurora's from intra-metropolitan in-migration and foreign immigration.

Understanding the Processes of Population Change

What was behind these processes?

Job driven migration: The first question is a macro-level one: To what extent were people coming to the region because of job opportunities and then deciding to live in the city (people following jobs as job opportunities attract people to the region), to what extent were people moving to the region because of its amenities and deciding to locate in the city (jobs following people), and to what extent were people already in the metropolitan area making a decision to

[16] GS 160A, Article 4A

relocate? The second question is more policy oriented: What was it about the central city that was attracting residents to locate there in greater numbers than our model predicted?

Of our 13 cities, the Charlotte and Portland MSAs experienced high rates of net in-migration as a percentage of 1990 population (above 10%), while the Durham, Sacramento, Seattle, and Tacoma MSAs experienced net in-migration in the vicinity of 7%. (The Chicago and Aurora, Lansing, Philadelphia, and Pittsburgh MSAs all had net population losses due to migration.) (See table 4.) To what extent can these high rates of population in-migration (or out-migration) be explained by job opportunities and to what extent by amenities?

Table 4: Population Change and Migration, MSA*

City	MSA	1990 Population	Foreign Immigration 1991-1999	Net Domestic Migration 1991-1999	Approximate Net Migration** 1991-1999	Approximate Net Migration as a percent of 1990 Population
Charlotte	Charlotte-Gastonia-Concord, NC-SC	1,056,212	14,959	147,736	162,695	15.4%
Portland	Portland-Vancouver-Beaverton, OR-WA	1,523,741	48,005	177,429	225,434	14.8%
Durham	Durham, NC	344,665	6,193	24,729	30,922	9.1%
Seattle	Seattle-Tacoma-Bellevue, WA	2,559,136	86,545	107,359	193,904	7.6%
Tacoma	Seattle-Tacoma-Bellevue, WA	2,559,136	86,545	107,359	193,904	7.6%
Sacramento	Sacramento-Arden-Arcade-Roseville, CA	1,506,792	59,989	50,251	110,240	7.3%
San Francisco	San Francisco-Oakland-Fremont, CA	3,711,756	300,301	-213,089	87,212	2.3%
Grand Rapids	Grand Rapids-Wyoming, MI	645,918	8,434	2,745	11,179	1.7%
Aurora	Chicago-Naperville-Joliet, IL-IN-WI	8,181,939	370,398	-526,481	-156,083	-1.9%
Chicago	Chicago-Naperville-Joliet, IL-IN-WI	8,181,939	370,398	-526,481	-156,083	-1.9%
Pittsburgh	Pittsburgh, PA	2,468,289	8,961	-74,885	-65,924	-2.7%
Philadelphia	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,435,550	98,634	-263,989	-165,355	-3.0%
Lansing	Lansing-East Lansing, MI	432,684	4,666	-26,987	-22,321	-5.2%

*Source: Real Estate Center at Texas A&M, accessed at http://recenter.tamu.edu/data/popm/

** Approximate net migration was calculated by adding gross foreign immigration to net domestic migration.

Pat writing FOOTNOTE ON DATA

Population increase driven by job opportunities would only occur if the entire region (the job market) was experiencing substantial increases in jobs. The Portland MSA experienced the greatest percentage increase in jobs (29.2%) between 1990 and 2000. The Charlotte, Durham, Grand Rapids, Seattle, and Tacoma MSAs also had employment increases in excess of 20%, while Sacramento's was just under 20%. So MSA employment increases could have been partly responsible for population increases in the metropolitan areas of Portland, Charlotte, Durham, Sacramento[17], Seattle, and Tacoma, all of which had substantial net in-migration. San Francisco experienced growth in employment in its MSA, but we were told by several people whom we interviewed that San Francisco's job market is unusual in that it expands beyond the San Francisco MSA, to the Silicon Valley and other outlying areas that are accessible through the public transportation system.

The Durham area provides a good example of economically driven population growth. For Durham, the presence of Research Triangle Park in particular, and Duke health and university facilities more generally, contributed new residents to the Durham community. Statistics provided by Research Triangle Park show that slightly under half the professional and managerial positions were filled from hires outside the region (45%) compared to a much smaller percentage of support staff (12%).[18] At the time of the survey in 1998, Research Triangle Park had 40,000 permanent and 10,000 contract employees.[19]

Amenity driven migration: Amenity levels of metropolitan areas may attract people to those areas. If these in-migrants are highly educated and skilled, employers seeking a highly qualified labor force may locate in the region to gain access to the labor force located there. It is difficult to assess metropolitan areas in terms of their amenity characteristics. A variety of commercial ranking sources are available, but the data in all of these have validity problems. Taking one example as merely indicative, data from Sperling and Sander (2004) rank 331 MSAs on a variety of indicators, each of which is a composite of several variables. Taking their rankings for

[17] While less than predicted by the model, Sacramento experienced population growth of 10% between 1990 and 2000.
[18] Hammer-Siler-George Associates. *The Research Triangle Park: The First Forty Years*, prepared for Research Triangle Foundation. Silver Spring, Md.: Hammer-Siler-George Associates, February 19, 1999, p. 7.
[19] Hammer-Siler-George Associates. *The Research Triangle Park: The First Forty Years*, prepared for Research Triangle Foundation. Silver Spring, Md.: Hammer-Siler-George Associates, February 19, 1999, p. ii.

climate, leisure, arts and culture, and quality of life as measures of amenities and averaging them (giving each equal weight)[20], the Durham, Portland, Sacramento, Seattle, and Tacoma metropolitan areas, all of which gained substantial population during the 1990s, also all ranked within the top 100 areas in attractiveness. However, several of the other metropolitan areas whose cities were in our sample and which did not gain population relative to what our model predicted also had very high amenity rankings.

Richard Florida has developed a "creativity index" that ranks MSAs according to their degree of creativity, with creativity based on technology, talent, and tolerance[21]. Three of the four MSAs that received the highest rankings on Florida's index (San Francisco, Durham, and Portland) are also among the five cities whose actual population growth exceeded our model's prediction and also among those that attracted a disproportionate share of new in-migrants to their MSAs. The other city in the top four of Florida's index, Seattle, also attracted a disproportionate share of new MSA in-migrants However, Charlotte, another city that exceeded the model's prediction and attracted more MSA in-migrants than expected ranked near the bottom, scoring higher on the "Creativity Index" than only Pittsburgh and Grand Rapids among our cities covered in the index (see table 5).

[20] Sperling, Bert and Peter Sander (2004). *Cities Ranked and Rated: More than 400 Metropolitan Areas Evaluated in the U.S. and Canada, 1st Edition*. Hoboken: Wiley Publishing, Inc.
[21] Florida, Richard (2002). *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life.* New York: Basic Books.

Table 5: Creativity Index Rankings*

City	Creativity Index
San Francisco	0.958
Seattle	0.955
Durham	0.932
Portland	0.926
Sacramento	0.895
Lansing	0.833
Philadelphia	0.778
Chicago	0.754
Charlotte	0.67
Pittsburgh	0.601
Grand Rapids	0.525
Aurora	N/A
Tacoma	N/A

*Source: Florida, Richard (2002). *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life.* New York: Basic Books. Appendix B, Table 1.

In-migration to the region, whether as a result of job opportunities or amenities, does not necessarily mean that in-migrants will locate in the city. Table 6 displays the percentage of in-migrants to their MSA that each city would have expected if it simply captured the same proportion of MSA population that it comprised in 1990 as well as the number it did, in fact, receive. The city of Tacoma received nearly three times its expected share of new MSA in-migrants between 1995-2000, San Francisco received nearly three times its expected share, Charlotte received nearly double, Seattle 50% greater than expected, while Portland, Aurora, and Chicago also all received more than expected. Something about these cities seemed to attract a disproportionate share of new in-migrants. On the other hand, four of the six underperforming cities, Philadelphia, Pittsburgh, Sacramento, and Grand Rapids all attracted a lower than expected share of new MSA in-migrants.

In addition, a city may have gained population because people in other parts of its metropolitan area decided to move into the city. Clearly Aurora, which is both a city and a commuter suburb, benefited from such movement, increasing its population by nearly 19% through in-migrants from other parts of the Chicago MSA.

As the above suggests, some of our cities were able to attract a substantial number of people from elsewhere to live within the city's boundaries. What can we say about why this occurred? First, job growth in the region is a necessary, but not sufficient, condition for migration into the central city. Second, some central cities were able to improve their intra-regional market share by becoming more "vital;" they were more attractive places to live relative to their suburbs over the decade of the 1990s. Housing values and trends are a good proxy for city "vitality."

Table 6: Expected In-Migration Based on City's Percentage of MSA Population

City	Total in-migration to MSA, 1995-2000*	City as % of 1990 MSA population	Expected in-migration of new MSA residents to City based on share	Actual in-migration of new MSA residents to City*	% of in-migration City received	Difference between % expected share and actual % in-migration
San Francisco	311,974	19.6	61,146	177,122	57%	37.4%
Charlotte	194,985	38.6	75,341	140,132	72%	33.4%
Tacoma	151,249	6.9	10,436	38,564	26%	19.1%
Seattle	422,133	20.2	85,270	127,309	30%	9.8%
Portland	276,606	28.7	79,386	99,347	36%	7.3%
Chicago	860,891	34	292,703	310,472	36%	2%
Aurora	860,891	1.2	10,479	22,248	2.6%	1.4%
Pittsburgh	339,043	15	50,856	43,403	13%	-2%
Grand Rapids	123,217	29.3	36,100	32,916	27%	-2.3%
Sacramento	309,781	24.9	77,135	67,825	22%	-2.9%
Philadelphia	606,519	29.2	177,104	130,116	22%	-7.2%
Durham	Not available	39.6		51,214		
Lansing	Not available	29.4		17,470		

* Source: NEED

Housing: Changes in housing values are a measure of the overall vitality of a city, since the package of amenities and disamenities that a city has to offer are capitalized into housing prices. We examined changes in housing values (see table 7) over the decade of the 1990s compared to the decade of the 1980s and found that six of our 13 cities had increases in median house values between 1990 and 2000 substantially in excess of the national average of 52.4% - Portland (164.3%), Seattle (90.2%), Tacoma (87.7%), Chicago (70.6%), Charlotte (66.6%), and Aurora (66.5%). For Portland and Tacoma, these increases were also far greater than their rate of house price increase from 1980 to 1990 (only 6.9% for Portland during the decade of the 1980s and 48.0% for Tacoma), while for Chicago the rate increased more modestly (70.6% during the 1990s compared to 64.4% during the 1980s).

Table 7: Change in Median Housing Values*

City	Percent Change in Median Housing Values (1980-1990)	Percent Change in Median Housing Values (1990-2000)
Portland	6.9%	164.3%
Seattle	107.1%	90.2%
Tacoma	48.0%	87.7%
Chicago	64.4%	70.6%
Charlotte	75.2%	66.6%
Aurora	65.8%	66.5%
Grand Rapids	73.0%	58.7%
Durham	122.8%	57.6%
Lansing	44.4%	52.8%
Pittsburgh	28.6%	47.4%
San Francisco	181.8%	34.7%
Philadelphia	104.2%	23.3%
Sacramento	101.2%	12.7%

*Source: State of the Cities Data System. Accessed at: http://socds.huduser.org/Census/Census_Home.html.

Another measure of city vitality is housing activity, particularly new residential building permits issued, comparing 1991 and 2000 levels with those of the preceding decade. The measure is admittedly ambiguous: it is unclear whether newly built and available housing is attracting in-migrants to the city or whether the new housing simply reflects a supply side response to increased demand. The three cities in our sample with the highest rate of increase in building permits from 1991 to 2000 compared to change over the previous decade were Portland, Durham, and Aurora (data for Charlotte were not available for 1980 and 1990). Aurora experienced a

36% increase in housing units between 1990 and 2000, the largest increase of our cities, and far above the national average of 13%.

Efforts to improve a city's vitality, if successful, should produce an increase in the number of households without children – young single individuals, childless couples, empty-nesters moving back to the city, all seeking the amenities offered by a city and not deterred by the generally lower quality of city schools relative to those of suburban schools. Of the cities that captured a disproportionate share of in-migrants to their MSA, Charlotte and Durham both had substantial increases in family households without children between 1990 and 2000 (34% for Charlotte and 40% for Durham), exceeding their increases from family households with children. Portland also had an 18% increase in family households without children; that rate was nearly double that of its increase in families with children. San Francisco and Chicago had both substantial increases in family households without children (13.9% and 13.2% respectively) and substantial declines in family households with children (-12.4% and -10.8% respectively). Pittsburgh, Philadelphia, and Lansing all lost large numbers of families with children with little or no gains in families without children (indeed, Pittsburgh lost 11.5% of its family households without children). (See table 8).

Table 8: Change in Households with No Related Children Present, 1990-2000*

City	Number of All Households		Number of Households without children		Percent of Households without children		Change in percent of Households without children (1990-2000)
	1990	2000	1990	2000	1990	2000	
Aurora	33,710	46,489	9,646	13,701	28.61%	29.47%	0.9
Charlotte	158,991	215,449	49,687	66,349	31.25%	30.80%	-0.5
Chicago	1,025,174	1,061,928	288,185	326,102	28.11%	30.71%	2.6
Durham	56,001	74,981	15,742	22,074	28.11%	29.44%	1.3
Grand Rapids	69,029	73,217	20,033	20,939	29.02%	28.60%	-0.4
Lansing	50,635	49,505	13,702	13,499	27.06%	27.27%	0.2
Philadelphia	603,075	590,071	187,016	189,426	31.01%	32.10%	1.1
Pittsburgh	153,483	143,739	48,181	42,646	31.39%	29.67%	-1.7
Portland	187,268	223,737	53,950	63,707	28.81%	28.47%	-0.3
Sacramento	144,444	154,581	40,641	44,485	28.14%	28.78%	0.6
San Francisco	305,584	329,700	79,461	90,479	26.00%	27.44%	1.4
Seattle	236,702	258,499	65,591	67,090	27.71%	25.95%	-1.8
Tacoma	69,939	76,152	19,996	22,406	28.59%	29.42%	0.8
United States		105,480,101					

*Source: U.S. Bureau of the Census, 1990 Census of Population and Housing, STF-1 Files, Table P016 "Household Size and Household Type"; 2000 Census of Population and Housing, STF-1 Files, Table P018 "Household Size and Household Type"
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Schools: Cities also could have attracted residents by improving their public services and their school systems and by reducing crime. The last two, in particular, have been cited as disincentives for households to move into the city and as a factor propelling existing residents to move out of a city to its suburbs. Unfortunately, we have little data on what kinds of households are moving out of the city as opposed to the kinds moving in. However, we can infer that cities that have either no gains or net losses in households with children – Pittsburgh, Philadelphia, Lansing – are probably experiencing out-migration to the suburbs as a result of perceived poor city schools. Schools in other cities may be as bad or worse, but other aspects of city life may be sufficient for the city to retain a greater share of households with children.

Data for Pittsburgh suggest the fall in confidence residents have in the city school system. From 1990 to 2000, enrollment declined about a half percent per year for the Pittsburgh School District.

From 1997 to 2000, the decline accelerated, with enrollment falling by 2.5 percent in 2001.[22] "Whether this is because Pittsburgh families with school-aged children are sending their children to non-public schools or are moving away from the City in disproportionate numbers, the recent decline in enrollment suggests very strongly that the Pittsburgh School District is rapidly losing the confidence of parents."[23] The Policy Brief cites a Standard and Poor report that "for the 1999-2000 school year, S&P reports that only 80.3 percent of school-aged residents attended the Pittsburgh Public Schools," compared to an average of 88.2% in Pennsylvania and 92.3% in Allegheny County (including Pittsburgh).[24] A survey performed by the Commonwealth Foundation-Lincoln Institute in May 2001, supported these conclusions. Fifty-five percent of registered voters who were polled responded affirmatively when asked if "low quality schools are a cause" of people moving out of the city.[25] In Chicago, Mayor Richard Daley's takeover of the city school system in 1995 was seen as another step taken by the Mayor in making Chicago attractive to families. However, school improvement appears to be occurring at "a geological pace" according to one interviewee.

Grand Rapids and Lansing also experienced very substantial losses in school enrollment, far in excess of population losses (See table 9). Lansing had a 6.4% decline in population, but a 24.2% decline in school enrollment between 1990 and 2000. Grand Rapids had a 4.6% gain in population and a 17.1% fall in school enrollment over the same decade. (The substantial decline in Grand Rapid's school enrollment at the same time that population increased slightly was attributed by one interviewee to the exodus of students to inexpensive good quality religious schools within the city.) San Francisco's population increased by 7.3% while school enrollment declined by 2.7%.

Table 9: Change in School Enrollment, 1990-2000*

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[22] Haulk, Jake & William Rogel, (Aug. 28, 2002) "Undeserved Reward for Pittsburgh's Teachers Union". *Policy Brief 2(45),* The Allegheny Institute for Public Policy.
[23] Haulk, Jake & William Rogel, (Aug. 28, 2002) "Undeserved Reward for Pittsburgh's Teachers Union". *Policy Brief 2(45),* The Allegheny Institute for Public Policy.
[24] Haulk, Jake & William Rogel, (Aug. 28, 2002) "Undeserved Reward for Pittsburgh's Teachers Union". *Policy Brief 2(45),* The Allegheny Institute for Public Policy.
[25] City of Pittsburgh Pulse Poll, May 2001, accessed at http://www.lincolninstitute.org/archives/surveys/surv0501.htm on November 7, 2006.

City School District	Change in Number of Students 1990-2000	Percent change 1990-2000
Durham City School District	21,638	267.5%
Charlotte 1990: Mecklenburg County; 2000: Charlotte-Mecklenburg Schools	27,427	36.1%
Aurora East and West Unit School Districts	5,089	31.1%
Seattle School District	6,658	16.3%
Tacoma School District	4,628	15.7%
Philadelphia City School District	20,279	11.3%
Chicago School District 29	43,861	11.2%
Sacramento City Unified School District	3,272	6.8%
Pittsburgh School District	1,616	4.4%
Portland School District IJ	-15	-0.03%
San Francisco Unified School District	-1,671	-2.7%
Grand Rapids City School District	-4,293	-17.1%
Lansing Public School District	-5,075	-24.2%

Source: National Center for Education Statistics, Common Core of Data "Public Elementary/Secondary School Universe Survey " 1990-91 v.1a and 2000-01 v.1a; "Local Education Agency Universe Survey " 1990-91 v.1a and , 2000-01 v.1b; accessed at http://nces.ed.gov/ccd/bat.

Crime: Crime rates declined throughout the United States during the 1990s (though, among our 13 cities, Lansing and Pittsburgh had small increases in murder rates between 1990 and 2000 and Philadelphia and Tacoma had increases in larceny rates). All of the five cities whose population increases exceeded our model's predictions had declines in crime rates. In some cases the declines were spectacular, far in excess of national trends. (See table 10). Whereas nationally, the decline in larceny rates was 15.7 per 10,000 population, the decline in Charlotte was 241.4, in San Francisco 171.6, in Aurora 127.6, and in Portland 112.5. Only in Durham, among our five cities, was the rate of decline slightly below the national average (11.2 per 10,000).

Table 10: City Crime Rates*

City	Murder Rate 1990 (per 10,000)	Murder Rate 2000 (per 10,000)	Change in Murder Rate 1990-2000	Larceny Rate 1990 (per 10,000)	Larceny Rate 2000 (per 10,000)	Change in Larceny Rate 1990-2000
Aurora	1.1	1.1	0.03	396.1	268.5	-127.5
Charlotte	2.3	1.2	-1.2	685.8	444.4	-241.4
Chicago	3.1	2.2	-0.9	467.0	368.9	-98.1
Durham	1.7	1.5	-0.2	516.9	505.8	-11.2
Grand Rapids	0.9	0.9	-0.04	430.3	394.8	-35.5
Lansing	0.9	1.1	0.2	500.8	321.2	-179.6
Philadelphia	3.2	2.2	-1.0	268.9	323.5	54.6
Pittsburgh	0.9	1.0	0.1	348.0	299.4	-48.5
Portland	0.7	0.4	-0.4	593.0	480.5	-112.5
Sacramento	1.2	0.9	-0.2	439.1	353.3	-85.8
San Francisco	1.4	0.8	-0.6	491.5	320.0	-171.6
Seattle	1.0	0.6	-0.4	765.5	480.4	-285.1
Tacoma	1.4	0.8	-0.6	100.6	562.0	461.4
All places in U.S.	0.9	0.7	-0.2	319.5	303.8	-15.7

*Source: FBI, Uniform Crime Reports, prepared by the National Archive of Criminal Justice Data. Accessed at http://bjsdata.ojp.usdoj.gov/dataonline/Search/Crime/State/DownCrimeStatebyState.cfm/CrimeStatebyState.csv.

Tax Burden/Service Package: Residents consider tax/service packages when they make location decisions within a metropolitan area. We were unable, given obvious time and resource constraints, to do extensive research into changes in tax/service packages of cities relative to their suburbs between 1990 and 2000. However, in several of our cities – particularly those with slow population growth or decline – we were told that high city tax rates (coupled with poor city services) relative to those of suburbs was a problem. In Pittsburgh, for example, we were told by many of those we interviewed that the tax burden imposed on the city's residents is higher than that borne by suburban residents. Indeed, a study by the Allegheny Institute found that city and school taxes in 1999 combined to equal 8.17% of residents' income and 46% of the total state and local taxes they paid.[26] In a survey of registered voters in Pittsburgh conducted in May 2001, 73% agreed that high taxes are a cause of people moving out of the city of Pittsburgh.[27]

[26] Haulk, Jake, and Eric Montarti (Dec. 4, 2002). "Pittsburgh Taxes: A Clearer Picture." *Policy Brief, 2 (60.* Allegheny Institute for Public Policy.
[27] City of Pittsburgh Pulse Poll, May 2001, accessed at http://www.lincolninstitute.org/archives/surveys/surv0501.htm on November 7, 2006.

Philadelphia panelists felt that the city, which is also a county, taxes too much, taxes the wrong things, taxes unfairly, and taxes more than its competitor cities, all of which make it unattractive for both businesses and residents. Several people with whom we talked think that the city's commuter tax has hurt the MSA as a whole, and that the combination of an expensive tax system and poor services encourages people to live outside of the city. Indeed, one panelist called Philadelphia a "poster child for the law of unintended consequences" with respect to that combination, particularly the poor schools.[28] Another asserted that the "overwhelming perception in the 1990s by business was that people wouldn't come [to Philadelphia] because they had to pay more in taxes and get less in schools, so good housing affordability didn't help." And in a study he conducted with three other economists, Wharton Professor Robert Inman found that, "increases in the city wage tax rates significantly reduce the overall size of Philadelphia's economy."[29]

California presents an interesting example, because Proposition 13 limits property tax assessments and rates and therefore disrupts local government's ability to adjust tax/service packages. As a result of Proposition 13, California's schools are financed primarily by the State and a city is limited in its ability to adjust the tax/service package it can offer residents. Most of our interviewees commented on cities' financial constraints which limits their discretion. As one person explained, people choose to go to neighborhoods where students have fewer special needs and are not as expensive to educate thereby making funds available for other students. This is a result of student funding being substantially set by the State on a per capita basis. In Michigan, which also has a property tax limit, we were told that high taxes are not a reason for people leaving the cities; however, one Lansing official said he wished the ½% wage tax and 1% residence tax were reversed to increase the incentive to live in the city.

High taxes, on the other hand, were not seen as a problem in terms of attracting households to Charlotte and Durham. As one of our interviewees commented, "The downward pressure on local tax rates is pretty strong in North Carolina. The state pushes them to keep taxes down."

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[28] FMF PA panel #2, PA Economy League, 6/29/05.

[29] Haughwout, Andrew, Robert Inman, Steven Craig, and Thomas Luce, "Local Revenue Hills: Evidence From Four U.S. Cities," *Review of Economics and Statistics*, May 2004, 86(2), pp.570-585, at p.576.

The Charlotte Chamber of Commerce reports that the Tax Foundation finds North Carolina's state and local tax burden to be 21st lowest in the nation.[30]

Chain migration: Foreign immigrants may come to a region because of economic opportunities available in the region (see above discussion), but their decision about which region and city to move into may depend upon social networks established by previous immigrants that stretch back to the home country. This kind of path dependency was cited by one of our interviewees in Chicago who noted that many Mexican immigrants came to the city from a relatively small number of specific areas in Mexico. We heard similar comments in Grand Rapids, Charlotte, and Durham.

Leadership: To what extent can these results be attributed to public policy or enlightened civic leadership from either the public or private sector? Many of our cities made explicit efforts to improve city vitality, efforts that reflected conscious public policy decisions and sustained effort by mayors. Mayor Daley's vision of Chicago, described to us as "a marriage of quality of life and a good place for families to live, work, and play," has guided Chicago over the past 15 years. These efforts have included multibillion dollar investments in infrastructure (which several of our interviewees credited with bringing neighborhoods back to life), hundreds of millions of dollars spent on amenities ranging from public services like fire and police protection to new and refurbished libraries and public schools, as well as public parks, tree-planting, and investments in such public resources as museums and music halls.[31] As Terry Nichols Clark observed in the introduction to his book on the post-industrial city, "In the 1980s and 1990s, Chicago's government changed hugely, perhaps more than in all previous decades of the twentieth century …The younger Daley (Daley II) has increasingly stressed making the city a good place to live, as well as work." [32]

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[30] www.charlotte chamber.com
[31] *Investing in the Future: It Works*, World Business Chicago, p.16.
[32] Terry Nichols Clark, "Introduction: Trees and Real Violins in the Post-Industrial City," in *Trees and Real Violins: Building Post-Industrial Chicago,* ed. Terry Nichols Clark, 2. Book Draft, (Chicago: University of Chicago, December 2002 draft). Fiscal Austerity and Urban Innovation (FAUI) Project Archives, http://faui.uchicago.edu/archive.html (accessed October 12, 2006).

Additionally, Daley was able to get the basics done well. As one person remarked, the benefits of a machine is that the city functions: lights are changed, streets repaved, trash gets picked up. We were told an anecdote of when Daley visited Washington, DC to explain how they get these things done, he said, "I hire people to do a job, and if they don't do it, I fire them. So they do it." These changes in amenities and basic services may have been related to Chicago experiencing population growth between 1990 and 2000 after four decades of population decline.

Mayor Norm Rice's vision for the redevelopment of Seattle's downtown, with its focus on creating an "18-hour" downtown, is similarly viewed as a successful revitalization effort. The strategy entailed making transportation changes that favored shoppers and residents over commuters, bringing retail back to the downtown core, and encouraging residential development through rezoning and affordable housing subsidies. Under Rice's leadership, the city also formed a partnership with downtown stakeholders, the Downtown Seattle Association. The partnership made additional investments in public projects downtown, including infrastructure investment and stadium construction.

Tacoma, Washington, experienced a renaissance of sorts during the 1990s as a result of a sustained partnership between city government officials and prominent civic leaders. The vision for the revitalization of Tacoma's downtown originated with the so-called "Executive Council for Greater Tacoma," a subset of the city's larger business leaders' council. The council commissioned a study for the redevelopment of the Foss Waterway, which bordered Tacoma's corporate downtown and had been identified as a Superfund site, into an area that combined commercial development with museums, retail, and residential development. The partnership with the city provided the crucial element needed to bring the council's vision to fruition. The city bought the waterfront property, took responsibility for the cleanup effort, and issued bonds to pay for the reconstruction of the historic Union Station building, which now houses federal courts. The council was also responsible for convincing the University of Washington to place its Tacoma branch downtown instead of in the suburbs.

In Portland, Mayor, and later Governor, Neil Goldschmidt and Gov. Tom McCall crafted policies that encouraged urban development and redevelopment in existing urban areas while

simultaneously preserving farmland, open space, and natural resources. The well-known “urban growth area” of Portland arose from this commitment to preserving the environment and preventing land-consumptive, low-quality new development. This vision has guided the Portland area for more than 30 years in its development as an environmentally conscious, non-automobile-oriented culture known for its “new urbanism.”

Bruce Adams underscores the importance of Portland's leadership in his case study of Portland entitled "The Portland Way." He states: "Portland would not be as livable as it is today without the extraordinary leadership of elected officials like Tom McCall and Neil Goldschmidt, who were successful in establishing lasting institutions based on participatory and collaborative government."[33]

As this suggests, leadership and civic engagement more broadly rather than government activity more narrowly construed often appeared to be the critical factors in city vitality. In Charlotte, this leadership came primarily from the private sector. A few private sector business leaders were the major force behind revitalization of Charlotte in the 1990s. These leaders, particularly Hugh McColl, who was President of NationsBank which became Bank of America, Ed Crutchfield, who was head of First Union, and Bill Lee, who was Chairman of Duke Power, would work with city officials or, often as not, work on their own without them to accomplish their agenda. They forged a partnership that focused on their common vision to become a first class city, the backstory to all community activity that transpired in the City of Charlotte. “They go behind doors and a new building emerges”[34]. “The business of Charlotte is business” was a frequently-repeated phrase, as was, “Our purpose is business.”

Interviewees emphasized the scope of their vision and activities in Charlotte resulting from that vision: scattered site moderate income housing supplied by the private sector, consolidated services from the city and the county for keeping government efficient, reform of city government to flatten the bureaucracy and institute performance measurement, an emphasis on

[33] Adams, Bruce. "The Portland Way." From *Boundary Crossers: Case Studies of How Ten of America's Metropolitan Regions Work (Academy of Leadership, 1998).*
[34] INSERT CITE

education by a succession of governors to create an amenity that attracts residents and businesses, a risk-averse public policy emphasis on community stability and predictability that appealed to the business community, controlled urban growth and infrastructure provision through scheduled annexations, reinforcement of priority activities through on-the-street interdepartmental collaborations, continuance of state oversight of municipal finances, and effective public-private partnerships for many major civic projects and infrastructures.

INCOME CHANGE

In five of our cities (Chicago, Aurora, Charlotte, San Francisco, and Seattle) per capita income change was at least five percentage points greater than our model predicted, while in four (Grand Rapids, Lansing, Philadelphia, and Sacramento) it was at least four percentage points lower than expected. (See table 11 for actual and predicted values for income change between 1990 and 2000). Income change could have resulted from higher or lower than expected selective in-migration or out-migration, higher or lower than expected changes in income for incumbent city residents, or from annexation adding higher or lower than average income residents to the city. We examine each of these possibilities.

Table 11: Actual and Predicted Per Capita Income and Change

	Actual Values*				
City	Per Capita Income, 1990	Per Capita Income, 2000	Percent Change in Per Capita Income (1990-2000)	Predicted Change in Per Capita Income (1990-2000)	Difference Between Actual and Predicted Change
Aurora	13,335	22,131	66.0	42.7	23.3
Charlotte	16,793	26,823	59.7	48.6	11.1
Chicago	12,899	20,175	56.4	46.5	9.9
Durham	14,498	22,526	55.4	51.8	3.6
Grand Rapids	12,070	17,661	46.3	51.6	-5.2
Lansing	12,232	17,924	46.5	51.2	-5.0
Philadelphia	12,091	16,509	36.5	40.8	-4.3
Pittsburgh	12,580	18,816	49.6	53.0	-3.4
Portland	14,478	22,643	56.4	54.0	2.4
Sacramento	14,087	18,721	32.9	41.7	-8.8
San Francisco	19,695	34,556	75.5	56.3	19.2
Seattle	18,308	30,306	65.5	54.7	10.9
Tacoma	12,272	19,130	55.9	51.1	4.7
U.S.	14,420	21,587	49.7		

*Source: Census data, P114A. PER CAPITA INCOME IN 1989 - Universe: Persons Data Set: 1990 Summary Tape File 3 (STF 3) - Sample data; P82. PER CAPITA INCOME IN 1999 (DOLLARS) [1] - Universe: Total population, Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Processes of Income Change for Cities Whose Per Capita Income Increased More than Expected

We first consider cities whose per capita incomes increased more than expected and ask why this occurred.

Selective in-migration of higher income households: Did the city increase its income through an in-migration of higher income households that exceeded in-migration of lower-income households?

We begin by looking at the changes in the number and percentages of our cities' households with income in the highest national income quintile compared to the bottom. (See table 12.) Although it is possible that these increases occurred as a result of changes in income by non-migrating households, substantial changes across national income quintiles are strong evidence of in-migration. Similarly, major increases in the number of employed residents in higher paying occupational categories such as management and professional categories also indicate in-migration of higher-income households. Substantial increases, relative to national changes, in the number and percentage of residents with college degrees also suggest in-migration of households with high incomes. (See table 13.)

Table 12: Change in Income Distribution by National Quintile, 1989-1990*

City	Percentage Point Change in Percent in Bottom 20% (1989-1990)	Percentage Point Change in Percent in Middle 60% (1989-1990)	Percentage Point Change in Percent in Top 20% (1989-1990)
Winners			
Chicago	-1.0	-1.1	21.1
Aurora	-3.5	-4.3	7.8
San Francisco	-0.5	-7.2	7.7
Seattle	-1.5	-32.1	4.5
Portland	-2.7	-0.5	3.3
Charlotte	-1.4	-0.9	2.4
Durham	-1.1	-1.1	2.2
Tacoma	-2.1	-0.1	2.2
Losers			
Grand Rapids	-0.5	0.7	-0.2
Pittsburgh	0.7	-0.3	-0.5
Lansing	0.4	1.8	-2.2
Philadelphia	4.0	-1.6	-2.4
Sacramento	2.9	-0.2	-2.9

*Source: Data from State of the Cities Data System, downloaded files versions, available on-line at: http://socds.huduser.org/Census/Census_Home.html.

Table 12a: Income Distribution by National Quintile, 1989-1990*

	Income in 1989						Income in 1999					
City	Number of HHs** in Bottom 20%	Percent of HHs in Bottom 20%	Number of HHs in Middle 60%	Percent of HHs in Middle 60%	Number of HHs in Top 20%	Percent of HHs in Top 20%	Number of HHs in Bottom 20%	Percent of HHs in Bottom 20%	Number of HHs in Middle 60%	Percent of HHs in Middle 60%	Number of HHs in Top 20%	Percent of HHs in Top 20%
Aurora	4,995	14.84	21,584	64.12	7,082	21.04	5,290	11.34	27,891	59.79	13,468	28.87
Charlotte	25,638	16.13	98,753	62.13	34,555	21.74	31,701	14.69	132,071	61.2	52,030	24.11
Chicago	259,924	25.46	592,945	58.08	168,042	16.46	261,031	24.58	605,107	56.98	195,826	18.44
Durham	12,280	21.91	34,078	60.8	9,691	17.29	15,569	20.76	44,771	59.7	14,654	19.54
Grand Rapids	15,654	22.54	44,713	64.38	9,084	13.08	16,149	22.02	47,727	65.08	9,460	12.9
Lansing	12,094	23.79	32,362	63.66	6,380	12.55	11,954	24.17	32,380	65.47	5,124	10.36
Philadelphia	168,087	27.98	348,609	58.03	84,044	13.99	189,068	32.03	332,920	56.4	68,296	11.57
Pittsburgh	50,567	32.92	85,114	55.41	17,926	11.67	48,373	33.65	79,279	55.15	16,100	11.2
Portland	43,314	23.13	118,087	63.06	25,861	13.81	45,693	20.4	140,037	62.52	38,257	17.08
Sacramento	30,740	21.25	87,433	60.44	26,487	18.31	37,484	24.2	93,354	60.27	24,055	15.53
San Francisco	55,567	18.16	169,852	55.51	80,566	26.33	58,186	17.64	159,252	48.28	112,413	34.08
Seattle	46,126	19.47	143,353	60.51	47,429	20.02	46,477	17.97	148,844	57.55	63,314	24.48
Tacoma	17,131	24.56	44,390	63.64	8,231	11.8	17,113	22.48	48,363	63.53	10,650	13.99
U.S.	18,389,482	20.00	55,168,446	60.00	18,389,482	20.00	21,096,020	20.00	63,288,061	60.00	21,096,020	20.00

*Source: City households data totals from State of the Cities Data System, downloaded files versions, available on-line at: http://socds.huduser.org/Census/Census_Home.html. Source for U.S. Households data totals: U.S. Bureau of the Census, 2000 Census of Population and Housing, SF-1 Summary Files, Table QT-P10, "Households and Families: 2000"

**HHs refers to Households

Aurora is the clearest case of selective population in-migration of higher income households. Aurora's total increase in number of households between 1989-1999 was 12,987, while its increase in households in the top 20% of the national income distribution was 6,413 compared to an increase of only about 300 households in the lowest 20% of the national income distribution. The percentage of Aurora's population in the top quintile increased from 21% in 1989 to 28.9% in 1999. In addition, the number of employed Aurora residents in the management, professional, and related occupational categories increased by more than 10,500 (an increase of 85.9%). Further evidence is the massive increase in the number of individuals with college degrees from 10,677 in 1990 to 24,991 in 2000, an increase of 134.1%. Since the increase in people with college degrees over the period nationally was only 44.2%, it is reasonable to assume that most of Aurora's increase came from people with college degrees migrating into the city rather than an explosion of college degrees among pre-existent Aurora residents.

Table 13: Residents with College Degrees or Higher*

City	Number of residents with college degrees or higher, 1990	Number of residents with college degrees or higher, 2000	Percent Change in number of residents with college degrees or higher (1990-2000)
Aurora	10,677	24,991	134.2%
Charlotte	73,124	128,427	75.6%
Durham	30,475	49,307	61.8%
Portland	77,259	118,698	53.6%
U.S.	32,310,253	46,577,126	44.2%
San Francisco	187,835	267,992	42.7%
Tacoma	17,611	24,748	40.5%
Seattle	140,418	193,322	37.7%
Chicago	339,862	462,783	36.2%
Grand Rapids	23,636	28,222	19.4%
Pittsburgh	49,414	57,267	15.9%
Sacramento	55,155	61,042	10.7%
Philadelphia	156,027	172,641	10.6%
Lansing	14,159	15,604	10.2%

*Source: State of the Cities Data System. Accessed at: http://socds.huduser.org/Census/Census_Home.html.

Chicago also appears to have experienced in-migration of disproportionately high-income households. Households in Chicago increased by 41,053 during the decade. At the same time, the number of Chicago households in the top national quintile rose by 26,951, while the number of households in the lowest quintile increased by less than 1,000. Since the household increase of more than 40,000 was accompanied by a population loss of 176,000, it seems likely that the

net increase in high-income households consisted primarily of one or two people households without children. The number of employed residents in the high-wage management, professional and related categories increased by more than 75,000 (23.1%), compared to increases of less than 15,000 (7.2%) in service occupations and declines in production, transportation, and materials moving occupations. However, unlike Aurora, the increase in residents with college degrees was 36.2%, slightly lower than the national average. This is not necessarily inconsistent with in-migration of college educated residents, since Chicago has a substantial high school drop-out rate, and the increase in college degrees among existing residents may well have been substantially below the national average.[35]

San Francisco and Seattle both had substantial increases in high income households. San Francisco had an increase of slightly below 24,000 households between 1990-2000, all of which was accounted for by an increase of almost 32,000 households in the top quintile of the national income distribution (the number of bottom quintile households remained the same and there was actually a decline in the number of households in the middle 60%). Seattle had a similar profile: an increase of slightly less than 22,000 households, with nearly 16,000 of these in the top national income quintile. While the percentage of residents with college degrees changed at about the same rate as the national increase in both San Francisco and Seattle, the number of employed residents in high wage occupations increased at a much faster pace than the national average and the number in low-wage occupations fell at a more rapid rate than nationally. In San Francisco, employed residents in management, professional and related occupations rose by 43.9% (63,083), well above the national rate of 26.3%; in Seattle residents in high wage occupations increased by 36.9%. Both cities had declines in the number of employed residents in the lowest wage occupational category (-16.0% in San Francisco and -12.9% in Seattle compared to a decline of only -0.4% nationally).

[35] In some cases college students -- definitely graduate students - are counted in the Census as residents. This means that central cities with large numbers of students have built in transience - because one of their export products is former students, or degree holders. Also it means that these towns benefit from large numbers of people who have low incomes but fundamentally middle-class values. If you have to have poor people in your community these are the best poor to have.

Charlotte presents a somewhat different and more difficult case for interpretation. It had a disproportionate increase in households in the top income quintile and a 75% increase in residents with college degrees. This very strongly suggests population was added at the high end of the income spectrum, and the story we were told about Charlotte's economy in the 1990s supports this interpretation. During the 1990s, Charlotte became the second leading financial industry city in the nation. The banking industry was recruiting managers to its burgeoning workforce in Charlotte. Charlotte's employment base changed dramatically because the businesses recruited nationally and internationally. Charlotte's substantial increase in employment in the finance, insurance, and real estate (F.I.R.E.) sector attests to this. Charlotte has taken advantage of state laws to very aggressively annex surrounding land, so it is possible that the higher-income population was added at least partly through annexation rather than through in-migration related to household choice.

Although Durham's increase in per capita income of about 3.5 percentage points above our model's prediction was less than the five percentage points that we used as a cutoff for determining which cities exceeded our model's prediction, its experience is worth some discussion. Durham's increase in 19,000 households was related to an increase in 5,000 households in the top national income quintile, and an increase of 3,300 households in the lowest national income quintile. In terms of occupations, the number of employed Durham residents in management, professional, and related categories increased by more than 15,000 (55.0%). Durham also had an increase of 61.8% in residents with college degrees, far above the national average, and suggestive of in-migration of residents with high-income potential. Durham's growth in higher-income households was undoubtedly related to its proximity to the Research Triangle Park which experienced substantial growth in higher-income employees during the decade.

Portland's actual increase in per capita income was only marginally greater than that predicted by the model; yet, its increase of 56.4% was nonetheless well above the national average increase of 49.7% as well as above the average of 54.0% for our 13 case study cities. A convincing case can be made for selective in-migration as a cause of this high per capita income change. The number of households increased in Portland by 36,725, while the number of households in the highest national income quintile increased by 12,460 compared to an increase in the lowest quintile of 2,435. The number of employed residents in the high-paying

management, professional, and related occupational categories increased by 32,734 (46.7%), and the number of Portland residents with college degrees increased by over 41,000 (53.6%), again an indication of in-migration of individuals with high earning power.

By contrast the three cities in which changes in per capita income was at least 5% less than our model predicted – Sacramento, Lansing and Grand Rapids -- all experienced no growth or decline in the number of households in the top income quintile, an indication that higher-income households were not moving into the city. Sacramento lost about 2,500 households in the top national quintile (-9.2%), Lansing lost 1,261 such households (-19.7%), and Grand Rapids essentially experienced no change (an increase of 362 high-income households). All also experienced much lower increases in the number of residents with college educations, ranging from 10.2% in Lansing to 19.4% in Grand Rapids, far below even the lowest increase in those cities in which gains in per capita income exceeded the model's predictions (Chicago at 36.2%). While Philadelphia had only a slightly lower change in per capita income than our model predicted (our model predicted per capita growth well below the national average), it is worth noting that Philadelphia lost 15,631 households in the top quintile of the national income distribution between 1990-2000.

The above discussion strongly suggests that selective in-migration of higher-income households played an important role in the greater than expected increase in per capita and median income.

What can we say about the causes of income growth due to in-migration? Attraction of higher-income households may mean that the area was attracting jobs in high wage sectors, that households were migrating into the area to take those jobs, and that at least some of these households have decided to locate in the core city.

Growth due to the creation of high-wage jobs: To explore the first component – that the metropolitan area was gaining jobs in high wage sectors - we divided economic sectors into high wage and low wage sectors nationally and examined changes in these high and low wage sectors in the regions of each of our 13 cities. (See table 14.) Durham, Charlotte, and Seattle, all of which had per capita income increases above that which our model predicted, were among the six MSAs in our sample with the highest rate of increase in jobs paying above average wages (more than a 20% increase in such jobs). On the other hand, the Chicago metropolitan area

(containing both Chicago and Aurora) experienced an increase of only 7.3% in high-wage jobs, and the San Francisco MSA had an increase of only 13.9% in such jobs. At the other end, of the three cities that experienced a lower growth in per capita income than our model predicted, Lansing had virtually no increase in high wage jobs (2.5%). However both the Sacramento and the Grand Rapids region had above average increases in high wage jobs (25.3% and 24.8% respectively).

Table 14: MSA Wages Above or Below the National Average*

		Below Average			Above Average		
City	MSA	1990	2000	Pct change	1990	2000	Pct change
Aurora	Chicago-Naperville-Joliet, IL-IN-WI	1,780.89	2,175.00	22.1%	2,251.58	2,416.83	7.3%
Charlotte	Charlotte-Gastonia-Concord, NC-SC	231.96	365.03	57.4%	324.84	408.79	25.8%
Chicago	Chicago-Naperville-Joliet, IL-IN-WI	1,780.89	2,175.00	22.1%	2,251.58	2,416.83	7.3%
Durham	Raleigh-Cary, NC	137.73	219.23	59.2%	159.87	221.75	38.7%
Grand Rapids	Grand Rapids-Wyoming, MI	139.96	202.65	44.8%	169.06	209.23	23.8%
Lansing	Lansing-East Lansing, MI	91.17	108.69	19.2%	130.67	133.93	2.5%
Philadelphia	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1,206.12	1,421.54	17.9%	1,312.11	1,345.27	2.5%
Pittsburgh	Pittsburgh, PA	548.11	634.05	15.7%	501.77	523.76	4.4%
Portland	Portland-Vancouver-Beaverton, OR-WA	355.05	492.06	38.6%	392.56	501.36	27.7%
Sacramento	Sacramento--Arden-Arcade--Roseville, CA	296.86	396.28	33.5%	337.47	423.00	25.3%
San Francisco	San Francisco-Oakland-Fremont, CA	829.85	1,003.27	20.9%	1,012.49	1,153.51	13.9%
Seattle	Seattle-Tacoma-Bellevue, WA	582.17	801.67	37.7%	716.96	866.02	20.8%
Tacoma	Seattle-Tacoma-Bellevue, WA	582.17	801.67	37.7%	716.96	866.02	20.8%

*Source: Data on national wages by industry obtained from the Bureau of Economic Analysis, accessed at http://www.bea.gov/bea/dn/nipaweb/ Based on national average wages, industries were identified at "below average" or "above average" with respect to wages. Numbers of residents in high wage and low wage industries for each MSA were obtained from economy.com. Numbers are in Thousands.

Alternatively (or, more likely, in addition), the metropolitan area's amenities may have attracted mobile highly educated and higher income migrants to the area who then sought employment

once they arrived there and who then located in the city. This may well have been the case in Seattle, San Francisco, and Portland, all of which are high amenity locations and the first two of which had per capita income increases that greatly exceeded our model. As we noted, this occurred in the case of San Francisco even in the absence of substantial growth in high wage jobs.

Did the change in high-wage jobs or high amenity levels attract higher than average income in-migrants to the metropolitan area? (See table 15). We have already noted that the Durham, Charlotte, and Seattle MSAs, all of which had substantial increases in high-income jobs, also had very high rates of population migration into their metropolitan areas (see table 2 and discussion in population section on p. [11]). The same was the case for Portland, the high amenity area.

Table 15: High Income Households*

City	High income HHs**, 1990	High income HHs, 2000	High income HHs as a % of Total HHs, 1990	High income HHs as a % of Total HHs, 2000	Percentage point change in High income HHs (1990-2000)
San Francisco	89,357	118,938	29.2%	36.1%	6.8%
Aurora	8,452	14,594	25.1%	31.4%	6.3%
Seattle	53,533	68,637	22.6%	26.6%	3.9%
Portland	30,140	42,295	16.1%	18.9%	2.8%
Tacoma	9,933	12,099	14.2%	15.9%	1.7%
Charlotte	39,262	56,390	24.7%	26.2%	1.5%
Chicago	193,265	213,015	18.8%	20.1%	1.2%
Durham	11,102	15,778	19.8%	21.0%	1.2%
Grand Rapids	10,888	10,921	15.8%	14.9%	-0.9%
Pittsburgh	20,632	17,890	13.4%	12.4%	-1.0%
Lansing	7,664	6,008	15.1%	12.1%	-3.0%
Philadelphia	98,230	76,819	16.3%	13.0%	-3.3%
Sacramento	30,649	26,392	21.2%	17.1%	-4.1%

* Source: U.S. Census Bureau, Table P080. HOUSEHOLD INCOME IN 1989 - Universe: Households, Data Set: 1990 Summary Tape File 3 (STF 3) - Sample data. "High income households" are defined as those with incomes above the 80th percentile, according to the Census Bureau, in 1999 the 80th percentile income was 81,342 and in 1989 it was 74,045 (both in 2001 dollars).
** HHs refers to Households

We have also already discussed the general question of whether in-migrants to the metropolitan area were attracted to the central city in the preceding section on population (see pp. XX).

In-migration of higher-income households to the core city may have occurred either as a result of newcomers to the region settling in the core city or through existing higher-income suburban residents moving into the city. Given the data available to us, it is not possible to sort out the relative importance of each.

However, we can explore the conditions under which it would be likely that higher than average income households would be attracted to the city, either from the region or from outside of the region. If high-income households were locating in the core city more than previously, then there would likely have been disproportionate increases in households without children. The logic here is that virtually everywhere households who have sufficient income to choose decide to raise their children in a non-city environment to avoid perceived inadequate city schools. Between 1990-2000, the percentage of households with no children increased by more than 12% in all of the cities whose per capita income gains were greater than predicted by our model except Seattle (where the increase was only 2.3%). San Francisco has the lowest percentage of people under age 18. "Seattle, where there are more dogs than children," was a close second[36]

By contrast, cities whose income change was less than our model predicted all experienced low (less than 10%) or even negative increases in households without children (see table 8, above). If we focus particularly on high-income households with no children (households in the top 20% of the national income distribution), we find that Aurora, Charlotte, Durham, San Francisco and Seattle attract a larger percentage of households without children that are high-income households, 32 - 44%, than the other cities.

This increase in high-income households without children suggests that, other than schools, perhaps these cities were becoming more desirable places to live, i.e., the amenities they offered were increasing. Is there evidence to support this argument? As we discussed in the population discussion, crime decreased throughout the United States between 1990 and 2000, especially in central cities. During that period the murder rate in the US per 10,000 residents fell by 0.19 and the larceny rate per 10,000 residents fell by 15.68. In the six cities in which per capita income increased more than our model would have predicted, the murder rate fell by 1.17 per 10,000 in Charlotte, 0.87 in Chicago 0.63 in San Francisco, and 0.38 in Seattle. Durham's murder rate

[36] Egan, Timothy. March 24, 2005. Vibrant Cities Find One Thing Missing: Children. *NY Times.*

declined at the same rate as that of the nation, and Aurora's showed a very slight increase, but from a very low base. Five of the six cities had declines in the larceny rate far in excess of the national 15.68 per 10,000 residents decline. Seattle's decline was 285.1, while Charlotte's registered a decline of 241.4, San Francisco's was 171.6, Aurora's was 127.55, and Chicago's 98.1. (See table 10 above.)

It is also possible that the movement into the case study-cities reflected an increase in the available housing stock for higher income people, including an increase in luxury apartments and condominiums. The number of residential building permits issued between 1990 and 2000 was greater than issued from 1980 to 1990 for all of the cities whose per capita income exceeded our model's predictions except for San Francisco, which experienced a decline of -1.9%, while there were substantial declines in residential building permits for Sacramento, Lansing, Philadelphia, and Grand Rapids (-71.8%, -61.6%, -58.1%, and -27.6% respectively). (As we noted, it is, unfortunately, impossible to determine the extent to which this was a supply-side initiated response – build them (units) and they (in-migrants) will come – or a demand side one – build them (units) because they (in-migrants) are already here.

Selective out-migration of the poor: Did per capita income rise faster than our model predicted because low-income households left the city in disproportionately large numbers?

We test for this by examining whether there was a decline or small increase in households (relative to total household change in the city) in the lowest national income quintile, in the lowest-wage occupational category (production, transportation, and materials moving), and (again, relative to the national average) in the number of people with high school education or less, which is an indicator of low-earnings potential. Again, we note the obvious: we can do no more than make inferences, since we can't actually track households and their movement between 1990 and 2000.

Chicago provides the most interesting case. Its population increased by a little over 4% between 1990 and 2000, with an increase of over 41,000 households. Yet, households in the lowest national quintile of the population increased by less than 1,000. Chicago also had a decline of over 20,000 employed residents in the production, transportation, and materials moving occupational category, a decline of 9.3% (compared to a 0.5% decline nationally). At the same

time, Chicago experienced a 9.2% decline in residents with high school education or less (compared to a national increase of 17.5%), *despite* the fact that Chicago was one of the nation's largest magnets for immigrants from abroad (over 140,000 Chicago residents in 2000 had lived in a foreign country in 1995), who tend to disproportionately have lower education levels.

These data are consistent with comments from interviewees that poor families were leaving the city and moving into lower-income, low property wealth and low-service quality, suburbs and municipalities. The tear-downs of Cabrini Green and Taylor Homes, two enormous public housing complexes, were likely part of this move, as was the associated hot housing market in the city. One professor with whom we spoke at University of Illinois at Chicago, who has been tracking the effects of the loss of public housing, asserted that by late 1999 and early 2000, a large number of people had already been "moved out" in preparation for the tear-downs. And the promised replacement units have yet to be built. Meanwhile, mayors of nearby suburbs to the South and East of Chicago have complained about the increasing number of poor in-migrants, which they attribute to the city's push to drive them out.

San Francisco parallels Chicago in many respects. While its population increased by about 53,000 between 1990 and 2000 and the number of households increased by 24,000, the number of households in the bottom quintile of the national income distribution increased by less than 3000. Like Chicago, it experienced a decline (-9.6%) in residents without a high school education, even in the face of substantial foreign immigration (an increase of nearly 40,000 in foreign born residents), many of whom are likely to lack high school education and be in households in the bottom income quintile (although it is true that many of the immigrants to San Francisco are also likely to be above average income households). Many people we interviewed in San Francisco commented upon the out-migration of the poor and lower middle class to the suburbs, largely as a result of high housing prices. The data suggest that there was likely to have been such an out-migration, given the in-flow of new, presumably low-income, immigrants at the same time that the number of households in the bottom quintile remained essentially unchanged and the number of those without high school education fell substantially. Seattle follows essentially the same pattern, although, like San Francisco, it was likely to have attracted a larger share of higher-income foreign immigrant households than many other urban areas.

Why did low-income households leave Chicago, San Francisco, and Seattle? The most likely possibility is high and rapidly increasing housing costs, and a reduction of housing available for low-income people (public and federal or state subsidized housing, low-rent units replaced through condo conversions, etc.). Housing values increased by 90.2% in Seattle and 70.6% in Chicago between 1990 and 2000 compared to a 52.4% rate nationally. And while the median home value at the end of the decade was relatively low in Chicago ($132,400) despite the high percentage increase, in both San Francisco and Seattle housing prices had risen to breath-taking heights. In San Francisco the median home value was $396,400, up from $104,600 in 1980; in Seattle it was $259,600, up from $65,900 in 1980 (see table 16). The same trends have affected the rental markets of these cities. While the increase in median rent for all central cities in the United States was 35.2% between 1990-2000, it was 55.7% in Seattle, 42.1% in San Francisco (to $928 per month, the highest of any of our 13 cities and more than 50% higher than the average for all central cities), and 40.3% in Chicago. (See table 16.)

Table 16: Median Home Values, Rent and Changes, 1990-2000*

City	Median Home Value 1990	Median Home Value 2000	Percentage change in Median Home Value (1990-2000)	Median Rent 1990	Median Rent 2000	Percentage change in Median Rent (1990-2000)
Portland	$58,600	$154,900	164.3	$397	$622	56.7
Seattle	$136,500	$259,600	90.2	$463	$721	55.7
Tacoma	$65,700	$123,300	87.7	$413	$581	40.7
Chicago	$77,600	$132,400	70.6	$445	$616	38.4
Charlotte	$80,600	$134,300	66.6	$462	$684	48.0
Aurora	$81,400	$135,500	66.5	$499	$700	40.3
Grand Rapids	$57,600	$91,400	58.7	$414	$531	28.3
Durham	$80,000	$126,100	57.6	$440	$657	49.3
Lansing	$48,100	$73,500	52.8	$399	$498	24.8
U.S.	$78,500	$119,600	52.4	$447	$602	34.7
Pittsburgh	$40,500	$59,700	47.4	$368	$500	35.9
San Francisco	$294,800	$396,400	34.5	$653	$928	42.1
Philadelphia	$48,400	$59,700	23.3	$452	$569	25.9
Sacramento	$114,300	$128,800	12.7	$495	$625	26.3

*Source: State of the Cities Data System, 1990 and 2000 median gross rent data include all specified renter-occupied housing units. U.S. data from American FactFinder, U.S. Census Bureau website, 1990 Summary Tape File#3, Table H061A, Median Value, Specified owner-occupied housing units, site visited 6/29/06, from 1990 Census of Population and Housing.

Higher than expected increase in income for those who stayed in the city during the entire time: Increases in per capita and median income may have occurred as a result of unexpectedly high increases in income earned by existing (incumbent) residents.

Since we have no way of tracking households that remained in our cities, it is extremely difficult to make informed inferences about their income paths over the decade. However, we can perhaps back into the range of plausibility. Six cities had increased per capita income more than our model predicted. We have already noted that in all of these cities selective in-migration of high-income households, as indicated by a substantial increase in the number of households in the upper quintile of national income, played a role. In-migration of higher income groups is likely to also drive up wages (and therefore income) in the local service economy, thus benefiting existing residents as well.

Annexation: Cities that annexed substantial amounts of land (and thus added to population), may have systematically annexed households with income above the city's prior average.

Charlotte annexed 66.8 square miles of land between 199-2000 (more than 40% of its 1990 total land area) and 82,981 residents (21.0% of its 1990 total) at the time of annexation as a consequence. Interviews with respondents in Charlotte indicated that the city is sensitive to the income levels of the population it annexes (although one interviewee denied that this was an explicit factor in Charlotte's annexation decisions) and that annexation does result in increasing the number of higher than average income households The same process may also have occurred in Durham which annexed nearly 26 square miles between 1990-2000. According to Durham officials, the city has typically annexed land that is minimally inhabited and is awaiting development. It is not unreasonable to believe that, once development occurs on the annexed land, new households will be above the previous city average income level. However, this is speculation; we were unable to find any data to verify this.

Aurora also likely increased its per capita income through annexation. While it is relatively difficult for cities to annex in Illinois, Aurora Mayor Al McCoy's 1973 annexation of a private plot, along with subsequent smaller ones, turned out to be a critical factor in the city's transition from declining stand-alone post-industrial town to booming suburb. After the land along the Aurora-Naperville border was incorporated, a developer made it into a large mall, and the state

extended a highway along it, leading to both population, tax revenue increases, and community income. Aurora also annexed a much smaller parcel in the mid-1990s, which became another community of high-end single-family homes.

Seattle, another city where the increase in per capita income also exceeded our model's predictions, may have benefited from a similar process. Under Washington State's Growth Management Act, counties are no longer supposed to provide urban services, so all of the areas within the Urban Growth Boundary (UGB) are supposed to be covered by cities. This caused a process of annexation and incorporation in which the city selectively incorporated areas that would add to its tax base, and left the very poor in the unincorporated areas of the county.

Summary: Increases in per capita income in all five cities, Aurora, Chicago, Seattle, San Francisco, and Charlotte, occurred in large part as a result of in-migration of high income households. Aurora experienced the second largest percentage increase in high income households of our cities, together with the greatest increase in college educated residents. Its ability to attract highly educated, high income in-migrants is likely related to both its own attractiveness as a city as well as its proximity to Chicago. In Chicago and San Francisco, the in-migration of high income households was accompanied by an out-migration of low- and middle-income households, most likely as a result of the increasing unaffordability of housing. Amenities attracted high income households without children to Chicago, San Francisco and Seattle. In Seattle and San Francisco, the increase in high wage occupations may also have contributed to the income growth of their residents. Charlotte's increased per capita income was also related to the in-migration of college educated and high income households, likely in response to the metropolitan area's growth in high wage jobs, particularly in the finance, insurance and real estate industries. Annexation of land with high income residents also likely contributed to the greater than expected per capita income growth in Charlotte.

Processes of Income Change for Cities Whose Per Capita Income Increased Less than Expected**.**

We now turn to cities whose per capita income increases were less than our model predicted: Lansing, Grand Rapids, Sacramento, Pittsburgh and Philadelphia. Why did this occur?

Selective in-migration of lower- income households: It is possible that the cities that had lower than expected per capita income growth, may have experienced the opposite of our high growth cities: selective in-migration of low-income households. Such in-migration would be indicated by an increase in the number of households in the lowest income quintile and in the lowest paid occupational category, an increase in the number of individuals without high school degrees, and, in most cases, substantial foreign immigration.

Sacramento presents the best case for in-migration of lower-income households. It gained nearly 7,000 lower-income households over the decade, an increase of 21.9% from 1990; indeed, at the end of the decade, 24.2% of its households had income in the bottom quintile of the national income distribution compared to 21.3% at the beginning of the decade. This could well reflect its increase in immigrants from abroad: The foreign born population in Sacramento increased by 32,000 (63.4%) between 1990 and 2000, and there was a 6.5% increase in residents without a high school education, which would be consistent with substantial immigration.

Grand Rapids, and Lansing, however, both had only very small changes in the number of households in the lowest national income quintile. Lansing also had declines in employed residents in the lowest-paid occupational category and in residents with high school degrees or less, suggesting another mechanism was responsible for its income performance. Grand Rapids, however, had an increase of more than 3,000 employed residents (18.3%) in production, transportation, and material moving occupations, the lowest-wage occupational category, and only a small decline in the number of residents with a high school or less education. This is consistent with strong in-migration of low-income foreign immigrants. Indeed, there were 8,648 foreign immigrants to Grand Rapids, a city of less than 200,000 from 1995 and 2000 compared to only 2,205 between 1985 and 1990.

Selective out-migration of the higher-income households: It is possible that some cities may have experienced increases in per capita income that were less than what our model predicted because of a greater than expected out-migration of higher income households. The share of higher income households in the population declined substantially in three of the five cities in which per capita income was less than predicted (Lansing, Philadelphia, and Sacramento) and did not increase despite population growth in Grand Rapids. Lansing, followed by Philadelphia, and Pittsburgh, had the greatest percentage declines of the 13 case-study cities in terms of the

percentage of households in the highest national income quintile. Lansing had a decline of 19.7% (1,261 households), while the number of households in the remainder of the national income distribution category remained stable. Lansing also had a decline in the number of employed residents in the highest paid occupational category. Sacramento had a decline of nearly 2,500 households (9.2%) in households in the top quintile of the national income distribution, although it also had a gain of 11.5% in households in high-income occupations.

Grand Rapids presents a different situation. It experienced a very small gain of 3.9% (362 households) in high income households and a somewhat larger gain in households in the middle three income quintiles (6.7% or 3,015 households). Although the number and distribution of households across the national income distribution remained essentially stable, Grand Rapids experienced very substantial foreign immigration (an increase of 13,358 foreign born between 1990 and 2000 or 179.2%); it is possible that these poor immigrants were lodged in a lower portion of the lowest national income quintile than were the previous households in that quintile. Indeed, one of our interviewees in Grand Rapids told us that, although the immigration stream was quite diverse, many of the immigrants work at the low-end of the wage scale doing factory work and food processing.

Philadelphia and Pittsburgh also suffered from out-migration of higher-income residents, although Pittsburgh's actual per capita income change did not differ much from that predicted by our model, (the most likely reason why our model picked up this migration is that it started earlier in these cities than in the more western cities and is captured by the path dependencies built into the model). Philadelphia had a decline of 18.6% (15,631 households), while the number of households in the remainder of the income distribution did not change. However, the number of households in the lowest national quintile in Philadelphia increased by nearly 20,000 and the number in the middle 60% of the distribution fell by nearly 16,000, suggesting selective out-migration by the middle class as well as the more wealthy. The number of employed residents in the management, professional, and related occupations, the highest paid category, remained constant.

Pittsburgh's decline in the top national income quintile was 10.5% (1,872 households), but it also had a decline of 5,747 households in the middle quintiles, suggesting, like Philadelphia, that it was losing its middle-income households as well as higher-income ones.

Selective out-migration of higher-income families could result from unhappiness with city schools, high city crime rates, or, more generally, a deterioration in the attractiveness of the core city's tax/service package relative to suburbs. We have already discussed this to some extent in the section on population. Here we focus more on out-migration of higher income households.

The most commonly suggested reason in our interviews for selective out-migration was the poor performance of city schools, and this was supported by a survey conducted on behalf of Lansing in 1999[37]. Findings of the housing perception survey included "higher income residents looking to buy a home are more likely to look outside the City" (p. ii). Specifically, of the 42.9% of the city residents who are looking to buy houses outside of Lansing, 28% have incomes higher than $46,000, compared to 12.5% of the residents looking to buy homes in Lansing (p. 49). The reasons provided by survey respondents for moving to the suburbs included schools, property taxes, safety, and architectural characteristics (p. III-51). The survey concluded that "it is clear if the City does not generate some 'pull' factors, or at least alleviate current 'push' factors facing its more affluent residents, it will most likely witness an out-migration of this vital population" (p. III-52).

In Lansing, the quality of the housing stock may also have played a role. Lansing's 1999 Housing Market Study found that people preferred larger, newer houses, making the median 1,010 square foot, 53 year old, Lansing home less desirable than newer and larger homes that were available in the surrounding communities.[38] Lansing had a much larger percentage of 1 and 2 bedroom homes and smaller percentage of 3 to 5 bedroom homes than neighboring jurisdictions.

Lower than expected increase in income for those who stayed in the city during the entire time: Lower than expected increases in income for residents who were in the city from 1990 through 2000 may account for a city performing worse than the model predicted. It is virtually impossible to assess this possibility except by indirection. The Lansing area economy experienced traumatic economic restructuring during the 1990s that resulted in the loss of high

[37] Housing Market Study, City of Lansing, prepared by Gove Associates and W. E. Upjohn Institute. Dec. 1999.
[38] Housing Market Study, City of Lansing, prepared by Gove Associates and W. E. Upjohn Institute. Dec. 1999.

paying jobs in the auto industry. In 1989, 15% of the full-time workforce in the Lansing MSA was employed in the auto industry.[39] Between 1990 and 2000, Lansing lost 6,100 motor vehicle manufacturing jobs, a loss of 31%.[40] The regional location quotient for motor vehicles and equipment fell from 11.95 in 1990 to 7.14 in 2000.[41] Thus, as one of Michigan's cities with a substantial dependence on the auto industry, Lansing experienced a similar reduction in the employment of its residents in the auto industry. The three industries showing an increase in the percentage of employed residents were construction (1.2%), business and repair services (1.7%), and personal services (2.9%),[42] all of which provide lower wages than auto manufacturing. The result of the change in Lansing's industry mix was lower per capita income, as people found jobs outside of the automobile industry or highly skilled workers left the city to find jobs elsewhere.

Lansing, Grand Rapids, Sacramento, and Pittsburgh each experienced a slower increase in metropolitan wages per job than the nation and the other cities in our study. These relative declines in metropolitan area wages almost certainly would be mirrored in the wages of city residents. Lansing MSA workers had average wages of $23,789 in 1990, 90.6% of the national average of $26,262. In 2000, average wages in Lansing were $32,968, only 84.9% of the national average. Lansing went from the middle of our case-study cities in 1990 to the lowest in terms of the average wage in 2000. As described above, this has been attributed to the loss of manufacturing jobs in the motor vehicle industry.

The Grand Rapids, Sacramento, and Pittsburgh metropolitan areas all experienced declines relative to the national average, though not as great as Lansing's. In Grand Rapids, average wages changed from $22,641 (86.2% of national) to $33,164 (85.4% of national). Part of this may result from the reduction in furniture manufacturing. The Grand Rapids MSA location quotient for furniture and fixtures fell from 11.34 in 1990 to 10.44 in 2000. One interviewee

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[39] Johnson, George E. (2003). The Evolution of the Michigan Labor Market from 1970 to 2001. In Charles L. Ballard, Paul N. Courant, Douglas C. Drake, Ronald C. Fisher, and Elisabeth R. Gerber, eds. *Michigan at the Millennium*: *A Benchmark and Analysis of Its Fiscal and Economic Structure*. East Lansing, MI: Michigan State University Press, pp. 57-78, 69.

[40] Crary, David, George Erickeck, and Allen C. Goodman (2003). Economic Performance of Michigan Cities and Metropolitan Areas. In Charles L. Ballard, Paul N. Courant, Douglas C. Drake, Ronald C. Fisher, and Elisabeth R. Gerber, eds. *Michigan at the Millennium*: *A Benchmark and Analysis of Its Fiscal and Economic Structure*. East Lansing, MI: Michigan State University Press, pp. 215-239, 220.

[41] Crary, David, et al. (2003), p. 218.

[42] State of the Cities Data Set 1990, 2000 Census data

noted that Grand Rapids has an overconcentration of work force in declining industries. The average wage in the Sacramento metropolitan area declined from 93.6% of the national average in 1990 to 92.5% in 2000. Pittsburgh's average wages changed from $23,038 in 1990 (87.7% of the national average) to $33,137 in 2000 (85.8%). (See table 17.)

Table 17: MSA Wage Rates*

City	MSA Wage Rate Per Job, 1990	MSA Wage Rate Per Job, 2000	Percent Change in Wage Rate Per Job (1990-2000)
San Francisco	$28,801	$51,658	79.4%
Seattle	$25,030	$43,126	72.3%
Tacoma	$25,030	$43,126	72.3%
Portland	$22,846	$36,723	60.7%
Durham	$21,545	$34,049	58.0%
Charlotte	$23,145	$36,392	57.2%
Aurora	$26,629	$40,521	52.2%
Chicago	$26,629	$40,521	52.2%
Philadelphia	$26,023	$38,770	49.0%
U.S.	$26,262	$38,846	47.9%
Grand Rapids	$22,641	$33,164	46.5%
Sacramento	$24,572	$35,922	46.2%
Pittsburgh	$23,038	$33,317	44.6%
Lansing	$23,789	$32,968	38.6%

*Source: Bureau of Economic Analysis: Regional Economic Accounts. Accessed at: http://bea.gov/bea/regional/reis

Summary: The four cities that had per capita income growth lower than expected, Grand Rapids, Lansing, Philadelphia, and Sacramento, experienced the opposite of the "winners." They experienced both out-migration of high income residents and below average growth of residents with college educations. They also had a lower growth in the metropolitan area wage rate greater than the national average. Grand Rapids, which experienced minor population growth, attracted foreign immigrants who took low paying jobs. Sacramento also had substantial foreign immigration during this time period, apparently of low-income households who worked at low paying jobs. In Lansing, the loss of higher income households was accompanied by a decrease in residents' wages as the automobile industry continued to decline.

HOUSING (UN)AFFORDABILITY

We measured housing unaffordability as the percentage of households paying more than 30% of their income for housing (moderate unaffordability) and the percentage paying more than 50% of their income for housing (severe unaffordability). Four of our cities experienced increases in moderate housing unaffordability (defined as the percent of households spending 30% or more of family income on housing) of 1.4 percentage points or more greater than what our model predicted (Aurora, Portland, Seattle, and Tacoma), while only one city (Tacoma) had a greater increase in severe housing unaffordability (defined as households spending 50% or more of total household income on housing) than predicted (see tables 18 and 19). On the other end of the scale, six of our cities had declines (or lesser increases) in moderate housing unaffordability at least 0.5 percentage points greater than our model predicted (Grand Rapids, Lansing, Philadelphia, Pittsburgh, Sacramento, and San Francisco).

We emphasize again, that performing better on housing unaffordability than predicted by our model does not necessarily mean that housing became more affordable. It means that the percentage of households that devote 30 percent or more of their income to meeting housing expenses was larger than our model predicted. For example, our model predicted that moderate housing unaffordability in Philadelphia would increase by 2.9 percentage points between 1990 and 2000; in fact, it increased, but only by 2.0 percentage points. Similarly a real improvement in housing affordability between 1990 and 2000 does not mean housing is affordable, only that it is relatively more so than it was in 1990. Our model, for example, predicted that San Francisco would have essentially no change in moderate housing unaffordability over the decade; instead it declined by 4.2 percentage points. Yet San Francisco still had the fourth highest percentage of households of our 13 cities who were spending more than 30% of their income for housing in 2000. Four of our cities experienced actual declines in both moderate and severe housing unaffordability and also performed at least slightly better than predicted by the model (San Francisco, Grand Rapids, Lansing and Chicago).

Table 18: Actual and Predicted Housing Affordability at 30% of Income and Change

	Actual Values*				
City	Housing Affordability (30%), 1990	Housing Affordability (30%), 2000	Change in Housing Affordability (1990-2000)	Predicted Change in Housing Affordability (1990-2000)	Difference Between Actual and Predicted Change
Aurora	26.1	29.2	3.1	1.1	2.0
Charlotte	26.0	28.7	2.79	2.7	0.0
Chicago	37.3	36.3	-1.0	-0.7	-0.3
Durham	31.1	32.0	0.9	1.7	-0.8
Grand Rapids	28.4	26.2	-2.2	1.1	-3.3
Lansing	27.8	27.4	-0.5	0.5	0.05
Philadelphia	32.1	34.1	2.0	2.9	-0.9
Pittsburgh	32.6	32.8	0.2	0.7	-0.5
Portland	29.2	34.9	5.8	3.6	2.1
Sacramento	36.1	36.5	0.4	1.5	-1.1
San Francisco	39.4	35.2	-4.2	-0.1	-4.1
Seattle	30.6	35.1	4.5	3.0	1.4
Tacoma	31.5	36.7	5.2	2.1	3.1

*Source: State of the Cities Data Set, 1990, 2000 Census Data, from downloaded data set.

Table 19: Actual and Predicted Housing Affordability at 50% of Income and Change

	Actual Values*				
City	Housing Affordability (50%), 1990	Housing Affordability (50%), 2000	Change in Housing Affordability (1990-2000)	Predicted Change in Housing Affordability (1990-2000)	Difference Between Actual and Predicted Change
Aurora	8.8	9.4	0.5	0.5	0.03
Charlotte	10.0	11.3	1.3	2.4	-1.1
Chicago	18.5	17.8	-0.8	-0.7	-0.1
Durham	12.4	13.9	1.5	1.9	-0.5
Grand Rapids	12.7	11.4	-1.3	-0.2	-1.1
Lansing	14.3	12.1	-2.2	-1.0	-1.2
Philadelphia	16.2	17.7	1.5	1.6	-0.1
Pittsburgh	15.6	16.3	0.6	-0.01	0.6
Portland	11.7	14.4	2.6	2.1	0.5
Sacramento	15.5	16.4	0.9	1.4	-0.5
San Francisco	16.7	15.8	-0.9	0.9	-1.8
Seattle	12.1	14.2	2.1	2.2	-0.1
Tacoma	13.4	15.7	2.4	0.8	1.5

*Source: State of the Cities Data Set, 1990, 2000 Census Data, from downloaded data set.

Our housing affordability measure is quite broad; it covers the entire income spectrum and aggregates both rental and homeownership affordability into one overall number. To gain a better understanding of the processes at work, particularly as low-and-moderate income households are affected, it is useful to examine the data by income group[43] and housing tenure.

First, not surprisingly, housing unaffordability was a much larger problem for low-income households in both 1990 and 2000 than for the general population, and the increase in housing unaffordability was greater for low-income households. In Charlotte, for example, while 28.7% of all households paid more than 30% of their income for housing in 2000, 72.0% of very low-

[43] Under the U.S. Department of Housing and Urban Development's guidelines, "extremely low income" households have incomes of no more than 30 percent of the area median family income (AMFI). The comparison is family income, rather than household income, based on a family of four and adjusted for the number of members in the household. "Very low income" households have incomes of no more than 50 percent of AMFI, and this category includes extremely low income. "Low income" households have income more than 50 percent but not exceeding 80 percent of AMFI. "Moderate" or "middle income" households have income above 80 percent and below 120 percent of AMFI, while "high" or "upper income" households have income of at least 120% of AMFI.

income households (households whose income was less than 50% of the median) did so. This was quite typical of our 13 cities. (See Appendix 3, table 8.)

For low and moderate income households, increases in housing unaffordability for owner-occupancy far outpaced changes in housing unaffordability for renters. (This is typical of housing bubbles. Bubbles are defined as occurring when the capitalized net value of the stream of rental payments from properties are lower than the sales value of properties in a metropolitan region.) The percentage change in moderate or severe housing unaffordability for low and moderate income renters did not exceed the increase for owner-occupiers in any of our 13 case-study cities. In San Francisco, for example, the percentage of low income rental households experiencing housing unaffordability fell by nearly 10%, while the percentage of owner-occupiers experiencing unaffordable housing rose by nearly 21%. (See Appendix 3, tables 8-10.)

Housing Markets and Housing Affordability.

What caused the unexpected performance of our cities in terms of housing affordability and what kinds of households did it affect? It is immediately apparent that many of the cities experiencing strong population and income growth were the ones where the problem of housing affordability increased, both absolutely and relative to the predictions of our model, while cities with stable or declining population and low income growth rates were, in general the cities in which housing affordability as a problem declined (Philadelphia is an exception, in that while moderate housing unaffordability increased less than our model predicted, it nonetheless increased in absolute terms by more than two percentage points).

Housing cost increases can, of course, occur either through changes in the demand for housing or changes in the supply of housing that is available. Changes can also occur as a result of shifts in the demand or supply curves through changes in preferences for housing at varying income levels and through changes in the cost of supplying a housing unit. Finally, our measure of affordability is the portion of household income that is devoted to housing costs. While the numerator of that ratio can change due to changes in housing costs, the denominator can also change due to changes in income. Sorting out the relative effects of these processes in a rigorous way is beyond the scope of our analysis. However, we can present some suggestive data and make some reasoned inferences.

We begin by focusing on those cities in which housing unaffordability increased more than expected. Aurora and Portland both had substantial increases in households (38.6% and 19.6%) and in per capita income (66.0% and 56.4% compared to 49.7% nationally), indicating substantial increases in demand for housing. Seattle and Tacoma, while experiencing smaller increases in the number of households (slightly less than 10%) also had very substantial increases in per capita income (65.5% and 55.9% respectively). Clearly all of these cities experienced substantial increases in demand for housing. Charlotte and Durham also had huge increases in households and above average increases in per capita income (see table 20). While moderate housing unaffordability increased in both places, it did so at a lower rate than our model predicted. On the supply side, both Seattle and Tacoma added fewer net housing units than households, while Aurora added approximately the same number of housing units as households and Portland added in excess of 1500 more units than households.

Table 20: Housing Supply and Demand*

City	Number of Households 1990	Number of Households 2000	Change in Number of Households (1990-2000)	Number of Housing Units 1990	Number of Housing Units 2000	Change in Number of Housing Units (1990-2000)	Difference between change in # of Households and change in # of units
Aurora	33,662	46,649	12,987	35,599	48,713	13,114	127
Charlotte	158,946	215,803	56,857	170,067	229,689	59,622	2,765
Chicago	1,020,911	1,061,964	41,053	1,130,888	1,148,253	17,365	-23,688
Durham	56,049	74,993	18,944	60,413	80,319	19,906	962
Grand Rapids	69,452	73,336	3,884	73,654	77,727	4,073	189
Lansing	50,835	49,458	-1,377	53,782	52,926	-856	521
Philadelphia	600,740	590,283	-10,457	674,109	660,080	-14,029	-3,572
Pittsburgh	153,607	143,752	-9,855	169,752	162,481	-7,271	2,584
Portland	187,262	223,987	36,725	197,948	236,296	38,348	1,623
Sacramento	144,661	154,893	10,232	153,149	163,326	10,177	-55
San Francisco	305,984	329,850	23,866	326,966	342,686	15,720	-8,146
Seattle	236,908	258,635	21,727	248,279	268,697	20,418	-1,309
Tacoma	69,752	76,127	6,375	75,065	80,867	5,802	-573

*Source: NEED

Of those cities that had a greater decline in housing unaffordability than our model predicted, Lansing, Philadelphia, and Pittsburgh all had declines in the number of households, while Grand Rapids had a modest increase of 5.6% and Sacramento had an increase of 7.1%. All of these

cities had increases in per capita income below the national average. Together these small or negative increases in households and below average increases in per capita income suggest declining or moderate demand for housing; all of these cities had increases in moderate housing unaffordability at a lower rate than predicted by our model. Philadelphia, Pittsburgh and Lansing all had a decline in the number of housing units.

The cost of supplying housing may have played a role as well in affecting housing affordability. The greatest percentage increase in the cost of house construction between 1990 and 2000 occurred in the Philadelphia, Pittsburgh, Chicago, and Lansing metropolitan areas, all of which had increases of more than 30% (the increase nationally was 28%). Three of the five cities in these MSAs, except the two in the Chicago metropolitan area (Chicago and Aurora) had actual declines in housing units over the decade and three (all but Pittsburgh) had increases in moderate housing unaffordability at least somewhat above what our model predicted. These increases may well have been driven by the high cost of unionized construction in these areas. Interviewees in Philadelphia and Pittsburgh stressed that this was a problem in their cities. In Philadelphia, there is a differential between the cost of supplying housing in the city and the cost of supplying it in the suburbs due to a premium imposed by construction unions (and also by the extra costs of building codes and regulations in the city as opposed to the suburbs.) This provides an incentive for households to out-migrate to suburbs. Regarding unions, Wharton professor Robert Inman finds that they create general inefficiencies for cities, not just in housing, driving both businesses and people out to the suburbs. Inman calculates that "cities with strong unions depress city land values by an average of 12 percent. The fact that suburban land values also decline in the MSAs with strong union cities – by an average of 7 percent – suggests these fiscal inefficiencies lead to private sector inefficiencies as well."[44]

Charlotte and Durham, on the other hand, both had enormous increases in households, yet construction costs increased only 21%, and in 2000 both had construction costs that were only 75% of the national average. The conditions in North Carolina provided some competitive advantages to Charlotte and Durham, where low wages suppress construction costs. The construction industry benefits from North Carolina's right-to-work status and the migration to

[44] Inman, Robert P., *Financing Cities*, Working Paper, March 2005, at p.26.

the state of Hispanics, contributing to cost competitiveness. One panel member said that North Carolina has never had a union culture.

The other major component of the cost of housing, the cost of land, is more difficult to assess because of the lack of a reliable data set. A recent article by Davis and Palumbo (2006)[45] calculates the price of residential land for major American cities and provides time series for eight of our 13 case study cities. The price of residential land in Portland increased by 234.4% between 1990 and 2000, by far the greatest increase of our 13 cities (See table 21). As our interviews (and several studies) suggest, this was likely due to the existence of Portland's urban growth boundary, since it restricted land available for development and therefore drove up the price of land. For Durham and Charlotte, their ability to replenish the supply of developable land through easy annexation statutes in place in the state does reduced the pressure on land costs and therefore housing prices. A Charlotte area economic development official explained, "In terms of housing, there has not been a housing bubble. There's lots of open land to build on. It flattens the market." Aurora also had a smaller annexation during our time period (1994) with high income residents part of this parcel, but also had a significant one in 1973 that created the land footprint for the upscale mall that would be important to future upper income residents and space for future adjacent subdivisions.

Table 21: Price of Residential Land*

City	1990	2000	Percent change (1990-2000)
Charlotte	$67,899	$99,282	46.2%
Chicago	$54,617	$93,339	70.9%
Philadelphia	$68,944	$67,177	-2.6%
Pittsburgh	$4,973	$15,612	213.9%
Portland	$32,575	$108,943	234.4%
Sacramento	$94,657	$88,229	-6.8%
San Francisco	$376,169	$562,745	49.6%
Seattle	$88,559	$154,818	74.8%

*Source: Davis, Morris and Palumbo, Michael, "The Price of Residential Land in Large US Cities," Finance and Economics Discussion Series, Federal Reserve Board Washington, D.C., Paper 2006-25.

[45] Davis, Morris and Palumbo, Michael, "The Price of Residential Land in Large US Cities," Finance and Economics Discussion Series, Federal Reserve Board Washington, D.C., Paper 2006-25.

The vacancy rate provides a good overall summary of the interaction of demand and supply forces in the housing market. Seattle had a very low vacancy rate in 2000 (3.8% compared to 4.7% in 1990); Portland's vacancy rate was 5.3% (compared to 5.4% in 1990); Tacoma's was 5.8% (down from 6.8% in 1990); Aurora's rate was 4.6% (compared to 5.3% in 1990) (see table 22). All of these cities had greater increases in housing unaffordability than predicted by our model. Pittsburgh and Philadelphia, on the other hand, had vacancy rates of greater than 10%, while Lansing's vacancy rate was 6.5% compared to 5.9% in 1990.

Table 22: Vacancy Rates*

City	Vacancy Rate 1990	Vacancy Rate 2000	Change in Vacancy Rate (1990-2000)
Pittsburgh	9.7	11.5	1.8
Philadelphia	10.5	10.6	0.1
Chicago	9.3	7.5	-1.8
Durham	7.3	6.7	-0.6
U.S. central cities	8.0	6.6	-1.4
Lansing	5.8	6.5	0.7
Charlotte	6.5	6.2	-0.3
Grand Rapids	6.3	5.8	-0.5
Tacoma	6.8	5.8	-1.0
Portland	5.4	5.3	-0.1
Sacramento	5.8	5.3	-0.5
Aurora	5.3	4.6	-0.7
Seattle	4.8	3.8	-1.0
San Francisco	6.5	3.8	-2.7

*Source: State of the Cities Data Set, 1990, 2000 Census Data

San Francisco appears to be an anomaly, and there are numerous contributors to its status as such. It experienced substantial increase in demand, had a supply response that lagged the increase in households by some 8,000 units, had the lowest vacancy rate of any of our 13 cities (3.8%) in 2000 (compared to 6.5% in 1990), and yet had a decline in both moderate and severe housing affordability in absolute terms (-4.2 and -0.9 percentage points respectively) and also performed better than our model predicted. Part of the answer may be an increase in households doubling up (Of our 13 case-study cities San Francisco had by far the highest percentage of housing units with 1.5 persons or more per room, 8%, an increase of 1.8 percentage points from 6.2% in 1990). See table 23. Another factor may be the high incomes of its residents (the highest of our 13

cities and 8th highest of 325 cities). San Francisco is a city where 65% of the residents rent and it has the highest median rent of the 13 case-study cities. The median rent is more than $300 higher than the national average for all central cities, yet, the percentage of its residents paying more than 30% of their income for housing is similar to the average for major U.S. cities, and ranks fourth among our cities. [46] Rent control (discussed below) may also have played a role in constraining both costs and supply.

Table 23: Overcrowding*

	% of Households with >1.5 persons/rm 1990	% of Households with >1.5 persons/rm 2000	Chg in % of Households w/ >1.5 persons/rm (1990-200)
Durham	0.60	2.42	1.82
San Francisco	6.22	8.01	1.80
Sacramento	3.84	5.63	1.80
Charlotte	0.82	2.34	1.52
Chicago	3.15	4.62	1.48
Aurora	2.72	3.96	1.24
Grand Rapids	0.70	1.92	1.21
Seattle	1.91	2.93	1.02
Tacoma	1.93	2.82	0.89
Philadelphia	1.52	2.18	0.66
U.S.	2.08	1.95	0.50
Lansing	0.98	1.44	0.46
Pittsburgh	0.48	0.61	0.13
Portland	1.25	0.82	-0.43

*Source: H021. PERSONS PER ROOM - Universe: Occupied housing units, Data Set: 1990 Summary Tape File 1 (STF 1) - 100-Percent data; H20. TENURE BY OCCUPANTS PER ROOM [13] - Universe: Occupied housing units, Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Chicago had a modest increase in the number of households (41,053 or 4.0%), but an even smaller increase in housing units (17,365). The increase in housing overcrowding from 3.2% of occupied housing units in 1990 to 4.6% in 2000 suggests how this shortfall was resolved. Yet, this situation existed with a vacancy rate in 2000 of 7.5%, indicating that the cost of available

[46] Blash, Lisel, Holley Shafer, Monique Nakagawa, and September Jarrett (Sept. 2005). *Getting Behind the Headlines: Families Leaving San Francisco*. Public Research Institute, San Francisco State University, p. 6.

housing units was too high relative to the purchasing power of those seeking them. In other words, there was ineffective housing demand.

The price of housing is a result of both supply and demand factors. While the average percentage increase in house value from 1990 to 2000 for all central cities was 52.4% and for our 13 case-study cities was 64.1%, the increase for Portland was 164.3%! (See table 16, above). As noted above, this was likely due to the urban growth boundary, since it restricted land available for development and therefore drove up the price of land. These massive increases in the cost of housing in Portland must surely account for a substantial part of the reason why Portland was one of our four cities whose moderate housing unaffordability increased more than our model (which, of course, could not account for the growth boundary) predicted. Seattle and Tacoma, which are subject to Washington's growth management act, were second and third among our cities for increases in housing unaffordability at both 30% and 50% greater than our model predicted.

Seattle and Tacoma also experienced substantial increases in housing prices (90.2% and 87.7% respectively). All of the six cities whose moderate housing unaffordability increased less than expected had increases in housing values below that of our 13 city average, and all but Grand Rapids had increases below the all central city average (See table 16, above). Even San Francisco, whose median home value in 2000 was $396,400, more than three times the national median value for central cities and $100,000 more than the next most expensive of our 13 cities (Seattle), experienced a below average increase of 34.5% over the decade of the 1990s (compared to a massive increase of 181.9% during the 1980s, more than three times the average for all central cities).

The substantial increase in house values may have shifted the demand curve upward as well, as many households, viewing homeownership as a good investment, became willing to pay more (and thus a greater percentage of their income) for a home than they previously would have. One consequence of this is that the 30% of income threshold may not be a good proxy for moderate housing unaffordability, since an increasing number of middle-income households may be voluntarily choosing to exceed that amount as an investment.

We now turn to a more careful look at what was behind these processes.

Housing affordability as a problem of insufficient income: We have already discussed the relationship of overall housing demand (in terms of aggregate changes in households and per capita income) on housing affordability. But it is also possible that the movements of low and moderate income families into and out of the city rather than overall demand has the greatest impact on the housing affordability problem. In-migration of a substantial number of foreign immigrants may increase the housing affordability problem while out-migration of low-income households to cheaper suburbs because of the excessive cost of city housing may reduce the problem (or at least reduce the problem statistically). In San Francisco, Seattle, and Chicago we were told by interviewees that poor households were leaving the city because they couldn't find affordable housing there.

In terms of changes in the number of low-income households, as we have already noted, both San Francisco and Chicago had virtually no change in the number of households with income in the bottom quintile of the national income distribution, which, when combined with the fact that both cities had large numbers of new foreign immigrants, many of whom were undoubtedly in the bottom income quintile, strongly suggests a movement of many existing low-income households in 1990 out of the city by 2000. In both cases, the result would have eased the cities' housing unaffordability problems, at least in a statistical sense but not necessarily the affordability problems confronted by families when the entire metropolitan region is taken into consideration.

Charlotte, Durham, Sacramento, and Philadelphia all had substantial increases in households in the bottom quintile of the US population distribution, which suggests the possibility of increased problems of unaffordability. Indeed, all of these cities experienced absolute increases in both moderate and severe housing unaffordability, though none had actual increases in aggregate housing unaffordability greater than our model predicted.

To assess the impact of housing unaffordability on lower-income households, we look specifically at changes affecting households with incomes below 50% of the median family income (MFI) and those between 50% and 80% of MFI. (See Appendix 3, tables 8 and 9.) While Charlotte was the only one of our 13 case-study cities where the percentage of very low-income households (those with incomes less than half of MFI) paying more than 30% of their

income for housing increased between 1990 and 2000, several of our cities had increases in severe housing unaffordablity. The percentage of low-income households spending more than 50% of their income on housing increased by more than 3 percentage points in both Charlotte and Durham, by more than four percentage points in Seattle and Tacoma, and by 5.7 percentage points in Portland, suggesting a very severe increase in pressure on housing budgets of poor households.

The increase in housing unaffordability in several of our cities for low income households (those with household income between 50% and 80% of MFI) was more pronounced. Severe housing unaffordability (spending more than 50% of household income for housing) for low income households increased by more than 8 percentage points in Portland and Chicago, nearly 8 percentage points in Tacoma, and more than 3 percentage points in Charlotte. Moderate housing unaffordability increased by nearly 12 percentage points in Portland, more than 7 percentage points in Tacoma, and nearly 5 points in Durham.

Housing affordability as a problem of housing cost: There are a variety of activities, most of them taken by local and state governments, that might have affected housing supply and thus housing affordability. These include local rent control ordinances, regulatory impacts, property tax limitations, state and local housing production programs and subsidies, and inclusionary zoning efforts.

Since California, and particularly San Francisco, was affected by nearly all of these, we start there. San Francisco is a particularly interesting case, since, despite its very high housing costs, its housing affordability improved both absolutely and in relation to our model's predictions. We have already discussed some reasons this might have occurred, including the likely movement of low-income (and middle-income) households out of the city.

San Francisco is the only one of our cities that imposes rent control on rental units, so it is possible that the existence of rent control, by keeping rents low, is responsible for the city's unexpectedly good performance in reducing housing unaffordability during the 1990s. This is plausible, since San Francisco had the second highest percentage of renters in the country, 65%,

in both 1990 and 2000, compared to the national average of 34%.[47] As a result of state government intercession, the city's rent control covers only units in buildings constructed before 1979; however, these constitute 90% of the city's housing stock. Over 70% of San Francisco's rental units are subject to rent control (resulting in 45% of the city's population living in rent controlled units). Another 18% are also not subject to market rate rents, because of subsidies, rent reductions, or affordability restrictions.

While rent control was mentioned by some people we interviewed as contributing to the affordability of housing, we were told just as often that rent control was not effective or relevant to affordable housing concerns or that, along with excessive development fees (see below); it discouraged the production of new rental housing. While many people continue to support rent control, others we spoke with called it "vacancy decontrol." That is, units come out from under rent control once the unit is vacated and rents can then drift up to meet market levels. Some noted that rent control does not keep prices down, because it is only effective for long-term residents, and San Francisco has a transient population. A study conducted for the San Francisco Board of Supervisors found "no significant difference between the housing cost burdens of households in rent controlled and market rate units."[48]

However, a comparison of housing affordability trends affecting low and moderate income households in the rental market in San Francisco compared to owner-occupants clearly indicates that renters are faring better than homeowners. In 1990 74.3% of renters with incomes below 50% of median family income paid more than 30% of their income for rent and 44.2% paid more than 50% of their income for rent. By 2000 the percentage of renters in both of these categories had declined to 65.1% and 40.6% respectively. However the percentage of homeowners in both of these income categories paying more than 30% of their income for housing costs increased by almost than 20 percentage points in each case (from 37.8% to 58.7% for those with MFI below 50% and from 27.6% to 45.2% for those with incomes between 50%-80% of MFI). A similar increase occurred for those with MFI below 50% paying more than 50% of their income for housing (23.7% to 44.2%). (However, it should also be noted that the number of homeowners at these income levels in San Francisco is relatively small.)

[47] San Francisco Housing Data Book (2002).
[48] San Francisco Housing Data Book (2002), p. 72.

In Seattle and Tacoma, the affordability problem was also more rooted in owner costs. Among Seattle homeowners, 17.2% of all owner households were paying more than 30% of income in 1990, and 5.2% were paying more than 50%. In 2000, those percentages increased to 27.6% at the 30% level and 9.5% at the 50% level (See Appendix 3, Tables 8-10). The problem is particularly acute among the city's low-income households. For those owner households earnings less than 80% MFI, the increases in cost burden were phenomenal. The pattern is very much the same in Tacoma.

Clearly San Francisco's rent control laws provide benefits that go to households that are not poor in addition to those that are. A quarter of the rent-controlled units were occupied in 2000 by households with incomes of $100,000 or greater (compared with 30% of the market rate units). Households with incomes below $35,000 occupied 43% of rent-controlled units and 38% of market rate units[49]. In addition, 78% of the rent-controlled units in 2000 contained no children under the age of 18, suggesting that families are not the primary recipient of the benefits of rent control. While these data are only for 2000, they provide a sense, at that time, of how the benefits of rent-control were distributed among residents.

California also has a law that permits municipalities to enact inclusionary zoning ordinances that require low-and-moderate income housing to be part of new developments. However, San Francisco did not enact such an ordinance until 2000, so it would not affect the supply of affordable housing to these families during the 1990s.

California's Proposition 13 may also contribute to housing affordability in unintended ways by holding down mortgage and property tax payments for homeowners. This is due to the major incentive that Proposition 13 provides to existing homeowners not to move. California voters enacted Proposition 13 in 1976. This law limits the property tax rate to 1% of assessed value and limits increases in assessed value to 2% annually, until the property is sold, at which time it is re-assessed at its market value. This creates a strong disincentive for owners to sell their house in the region (on which their assessments have been limited to 2% annual increases since purchase) and to buy another house which will, as of their purchase, have been reassessed to market value.

[49] San Francisco Housing Data Book (2002.

Even if the houses have the same market value, the potential owners will end up paying substantially more in property tax if they move to the new house. However, given the rapid increases in house costs in the region over the past two decades, it is virtually certain that even the same quality house will cost much more than the purchase price of the house they are selling, thus necessitating considerably higher mortgage payments as well as tax payments. Thus, while sale prices may be the second highest in the country, the number of owners who purchase their houses is likely to be fairly small (in 2000, only 3% of homeowners had moved into their unit that year)[50]. Thus, many residents are likely paying rent or making mortgage and property tax payments for units that were purchased at lower prices. The limited turnover, as a consequence of Proposition 13, may be keeping prices affordable, at least for many of the 35% of residents who own homes. A study of the effect of Proposition 13 on mobility of California residents and migrants to California found that Proposition 13 increases tenure length of homeowners by up to three years, depending on the amount of the "subsidy" provided by the tax limitation.[51]

High development fees, another unintended byproduct of Proposition 13, were also cited as affecting housing affordability, but in the other direction, through their contribution to the high cost of housing construction in the San Francisco area. According to the Little Hoover Commission, "since Proposition 13, the latest generation of homeowners, rather than the entire community, shoulders the cost associated with affordable housing" through the imposition of development fees[52]. The Commission, an independent state oversight agency, issued a report in 2002 proposing solutions to California's affordable housing crisis that identified development fees as an impediment to increasing the housing supply throughout the State. In response to the limitations on local revenues as a result of Proposition 13, jurisdictions have imposed development fees and exactions. "California leads the nation in imposing fees on new residential development . . . . Fees average $20,000 to $30,000 per unit and account for more than 15 percent of new home prices in jurisdictions providing affordable housing"[53]. We were told, in Seattle, that one local response to the State's growth boundaries has been an increase in hookup

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[50] San Francisco Housing Data Book (2002.
[51] Wasi, Nada and Michelle J. White (2005). Property Tax Limitations and Mobility: Lock-in Effect of California's Proposition 13. *Brookings-Wharton Papers on Urban Affairs: 2005*, 59-97.
[52] The Little Hoover Commission (May 2002). *Rebuilding the Dream: Solving California's Affordable Housing Crisis*, accessed at http://www.lhc.ca.gov/lhcdir/ report165.html, (Executive Summary, p. xv).
[53] The Little Hoover Commission (May 2002). *Rebuilding the Dream: Solving California's Affordable Housing Crisis*, accessed at http://www.lhc.ca.gov/lhcdir/ report165.html, (p. xv).
(Executive Summary, p. xii).

and infrastructure fees imposed by cities, which has made development more expensive and led developers to build more in the unincorporated areas of counties within the boundary.

Landis et al. (2001) found that in California local jurisdictions typically charge more than two dozen different fees for planning, building permits, and capital facilities.[54] The average cost of such fees in California in 1999 was $20,327 for owners of infill homes and $15,531 per new apartment unit. It was estimated that fees account for an average of ten percent of the median price of new single-family homes. Fees were found to be higher in faster growing markets, typically the more affordable communities. In San Francisco, which has a limited housing supply, so is not considered to be a fast growing (nor affordable) market, development fees for a single-family infill unit model home with a value of $199,000 were estimated at $15,476, and fees for a single apartment unit of a 45 unit development were $5,233. In Sacramento, fees for the same type of single family development, with a value of $160,000, were estimated at $11,344, and the apartment unit fees were estimated at $8,277.

In Washington, also, we were told that new housing was made more expensive because of high impact fees assessed on new construction, especially for schools. Infill development that resulted from growth management increased impact fees for infrastructure because city infrastructure had to be replaced to support the higher density. These fees, combined with imposition of a 1.28% real estate excise tax on the sale value, drive up the costs of housing production.

Many states and city governments issue housing bonds either directly or through state housing finance agencies as a means of financing some housing for low-and-moderate income households. For example, in California voters approved $600 million of general obligation

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[54] Landis, John, Michael Larice, Deva Dawson, and Lan Deng (2001). *Pay to Play: Residential Development Fees in California Cities and Counties, 1999.* Berkeley: Institute of Urban and Regional Development. In San Francisco, for example, the following fees are assessed: planning department plan check, environmental assessment/review, building department plan check, building department permit, engineering/public works department, grading permit, electrical permit, mechanical permit, plumbing permit, sanitary sewer connection, water connection, local traffic mitigation, fire service, school district, community/capital facility, and affordable housing dedication/in-lieu.

bonds in 1988 and 1990 to finance state housing programs, but apparently no evaluation of the impact of the bonds on production of affordable housing was conducted.[55]

Pennsylvania allows, but does not require, counties to participate in an Affordable Housing Trust Fund, which they can do by doubling their recording fees and putting the money into a separate account for affordable housing. As of 2005, 51 of 67 counties had established them. Interviewees told us that the money had been used more to rehabilitate existing housing than to create new units. Even an official who pointed to the creation of some new affordable housing in Wilkes-Barre as part of a redevelopment effort admitted that only 28 ownership units had been built. One official in the Rendell Administration suggested that, state-wide, with the use of low-income tax credits, there are between two and six thousand rental units being created each year, but we have no documents to back that claim.

North Carolina also has a state housing trust fund, but it does not have a dedicated source of revenue and interviewees involved in housing in North Carolina report that the housing trust fund is seriously under funded. As one interviewee observed, "The state has done little in housing. Not a lot of state money has gone to this. . . . The state has an embarrassingly small housing trust fund."

In virtually all cases the actual volume of housing produced for low-and-moderate income families is very small. As one person in California commented, **"**To the extent housing policies have improved, it would be despite the policies of the state government. Things done at the margins to provide affordable housing are relatively unimportant compared to the overall structure."

However, in San Francisco, a strong non-profit community develops an average of 1200 units per year according to a representative of the Mayor's Office. At a state level, California requires redevelopment authorities that use tax increment financing (TIFs) to set aside (although not necessarily to use) 20 percent of the increased revenue for affordable housing. Redevelopment authorities are responsible for the construction or rehabilitation of more than 63,000 units of

[55] The Little Hoover Commission (May 2002). *Rebuilding the Dream: Solving California's Affordable Housing Crisis*. Executive Summary, p. xvi. Accessed at http://www.lhc.ca.gov/lhcdir/report165.html.

affordable housing since 1994, making them the state's second-largest funder of affordable housing in California after the federal government.

Sacramento, whose performance in housing affordability over the decade was better than predicted by our model, maintained a land reserve, which, we were told, was used to satisfy supply as population increased and which resulted in the moderation of land prices – the opposite of Portland's growth border that restricted land supply and drove up prices.

Summary: Four of our cities experienced a greater than expected increase in housing unaffordability, Aurora, Portland, Seattle, and Tacoma. In Aurora and Portland, one of the primary drivers appears to have been the increased demand from the growing population that the supply, while increasing, could not keep up with. In Seattle and Tacoma, the increase in demand seems to be driven more by income growth than population growth. Washington's urban growth management, combined with high impact fees, limited the supply. In contrast, for Lansing, Philadelphia, and Pittsburgh, housing became more affordable as demand decreased with the loss of population and lower income growth. Sacramento and San Francisco's better than expected affordability may have been related to Proposition 13 which reduced housing turnover, keeping costs of current homeowners low. Some of the increase in demand in these two cities was met by increasing overcrowding, as these two cities had the highest percent of overcrowding of all of our cities. San Francisco's affordability was also a result of the out-migration of poor and middle-income families who could not afford housing.

THE ROLE OF PUBLIC POLICY

As researchers have noted, "it is difficult to distinguish the effects of public policy from those of fundamental economic and demographic shifts"[56]. Our research findings lead us to agree and add that idiosyncratic local factors unrelated to public policy also play a role. As a consequence, while it is not possible to provide a definitive answer about the role of local and state public policy on the outcomes we have discussed in population, income, and housing affordability changes, we can come to some informed conclusions. Our approach – first sorting out fundamental economic, demographic and social shifts through regression analysis and then engaging in a series of intensive case studies – enables us to do this.

City Policy

Our analysis has suggested that performance in all of these areas was driven largely through the differential movement of population into and out of the city. That, in turn, was a function of metropolitan wide employment opportunities and amenities (some of which are influenced by public policies), both of which attracted population to the region. Some of these in-migrants to the region settled in the central city. Whether or not these newcomers settled in the city (or people who previously lived in the city's suburbs decided to move there) depended upon the city's relative attractiveness as a place to live (its vitality) and its tax/service package. High taxes accompanied by a perception of poor quality services (as was, we were frequently told, the case in Philadelphia) were a major deterrent to population in-migration. Since the education system in cities was seen as poor in nearly all of our cities, population in-migration was largely limited either to higher-income households without school aged children or low-income households (mostly foreign immigrants) taking advantage of low housing prices and/or prior immigrant networks. Housing for higher-income households was partly a market response to demand and partly speculative building hoping that a demand would result.

Within that context, what role did city (and state) public policy play? City public policy could have contributed to improved city amenities and vitality. Indeed, we have already discussed (see

[56] Krontoft, Margrethe, Dan McMillen, and William A. Tesla. Dec. 2001. Are central cities coming back? The case of Chicago. *Chicago Fed Letter*, No. 172a.

pp. XX) various efforts in Chicago, Portland, and elsewhere to this end. These policies sometimes reflected extraordinary leadership and vision about the potential for transforming the city. Indeed, our case studies suggested that such leadership and vision may be critical to efforts to increase city population and income; indeed they may be the most important public contribution.

Metropolitan wide economic policy is extremely difficult for city public policy to directly affect, and, with few exceptions, we saw little evidence that city public policy played a role. In Charlotte the city government supported a private sector effort to make Charlotte a national leader in banking and financial services. That effort was itself an outgrowth of a state policy. In the late 1980s, North Carolina changed its state banking regulations allowing its banks to branch and acquire banks across state lines and to establish new banks and sales offices in other states. This was a more liberal set of banking rules than existed in other states. This allowed the kind of out-state bank acquisitions that led to the creation of NationsBank (which eventually acquired Bank of America and took the name of the California bank but kept its headquarters operation in Charlotte) and Wachovia as national financial institutions before banks elsewhere around the nation could undertake such interstate corporate expansion. Subsequently federal law changed to make multi-state banking easier, and North Carolina banks were well-positioned to take advantage of the new rule-making.

Chicago sought to affect metropolitan wide change with its expansion of the Midway and O'Hare airports as well as the encouragement of the University of Illinois Chicago as a co-flagship campus with Urbana-Champaign. Both Daleys saw the increase of institutions of higher learning and medical facilities, "eds and meds," as the intersection of development, quality of life, and human capital strategies.

Local tax/service packages are, by definition, local public policy and within local control, although state restrictions – a form of state policy - on local discretion to construct tax/service packages, such as Proposition 13 in California and Proposal A in Michigan, may prevent local governments from putting in place attractive tax/service packages. Cities that had high taxes and poor quality services and amenities faced serious difficulties in attracting middle and higher-income households and lost many of their existing residents in these categories. As a consultant told us, "No mayor wants lower real estate prices." Philadelphia and Pittsburgh are examples. When

asked what the city might have done to prompt so many upper- and middle-income families to flee, one of our Philadelphia panelists commented that, in addition to shifting taxes to give those with money an incentive to leave, "add bad quality of public schools, so middle-income people are paying high taxes AND private school." Another asserted that, given that combination, even "good housing affordability [could not] help" the city attract good residents or businesses. Similar statements were made about Pittsburgh, which was experiencing "suburbanization of residents without suburbanization of jobs."

The perceived quality of the local education system was seen as a problem in all of our cities, but, although we came across various local and state efforts to improve the local school system or to arrange the system so that households could continue to live in the city without attending the local system, there were no examples of acknowledged major improvements in school quality. While many cities were successful in attracting higher-income housing to their downtown areas (more an example of not preventing this through public policy), it did not appear that local public policy played a major role in making housing more affordable, and, in some cases, may have contributed to making housing affordability a greater problem. In San Francisco, it appeared that rent control did make rental housing more affordable in the period we examined, although this does not take into account its long-term effect on housing supply. In Portland, the Urban Growth Boundary, a state policy enacted with very strong city support, appears to have contributed to substantial increases in housing cost and to housing unaffordability. Other cities had high construction costs as a result of impact fees and building regulations that, whatever else they accomplished, probably reduced the supply of housing and increased its cost. Although many cities, with state aid, participated in low and moderate income affordable housing construction programs, the quantity of housing produced under these programs for these income categories was nowhere sufficient to have had much of an impact.

State Policy

What role do state governments play in city performance with respect to population, income, and affordability? The potential for state effect is certainly large. Research has suggested that state tax systems and policy choices (e.g., whether to have a state "Right to Work" law) play a role in

a state's ability to capture economic investment through business location decisions[57]. Since cities are lodged within a state, the overall state framework therefore plays a role in the attractiveness of a city and the city's region in attracting economic activity and thus income and population.

It was difficult, however, to discern the real impact of state tax policy on city performance during the period we examined. One economist we interviewed in Michigan argued that the performance of the state and its cities would have been considerably worse had it not substantially reduced taxes during the 1990s, an argument that was hotly disputed by several others. The economist noted that with the tax cuts, Michigan's unemployment rate fell below the national average for the first time in 27 years: "Taxes fundamentally changed everything." A consultant disagreed, saying that there is no evidence the tax cuts made a difference. He explained that from 1994 to 2003, when the tax cuts took effect, Michigan was in the bottom five for employment and per capita income growth. To evaluate this argument obviously requires a counterfactual which, although perhaps potentially possible to construct through development of a sophisticated state economic model, did not, so far as we could tell, exist. The tax reductions occurred between 1991-1998, with implementation of the final reductions in the fiscal year 1999-2000, making it unlikely they affected city performance during our time period. However, the tax reductions were substantial, resulting in a reduction of $1,275 million in tax revenue in 1995 and increasing to $3,938 million in 2000[58]. Nonetheless, other interviewees in Michigan strongly disputed the argument that tax reductions had had the beneficial effect alleged, with one noting that the large loss in tax revenue reduced government spending, which ultimately harmed the State.

Similarly, some California interviewees argued that high state taxes and costs were driving economic activity out of the state, but again others dismissed this as an important factor, and there was no evidence available to assess the claim. We heard several times that the individual income tax rate was so high at the higher income levels that it forces people to leave the State. The high state sales tax, close to 8% on average, was also seen as detrimental to business, especially with neighboring Oregon having no sales tax. While taxes at the State level were

[57] NEED TO ADD CITES
[58] Data provided by the Michigan Office of Revenue and Tax Analysis, Department of Treasury.

mentioned as a possible factor in location decisions, they were not viewed as relevant to local location decisions. As one person put it, "people don't change jurisdictions because of taxes, but because of housing affordability."

State education policy has an obvious impact on local schools through state education funding, standards, and the setting of the structure within which local schools operate. However, the ability of states to affect the quality of city schools – and thus the attractiveness of these schools to mobile households with children – appears to be very limited. While states vary in the amount of funding they provide to city schools, there does not appear to be much variation in the perceived quality of these schools among our cities.

States also can impose constraints or costs on cities that may adversely affect their performance. We have argued that city amenities and costs both play a role in the city's ability to attract and/or retain households and thus affect both city population and income. State-imposed tax and expenditure limitations that constrain city governments from devising tax/spending packages and distort community preferences are one example of problematic state activity that adversely affects cities. We were told over and over again that California's Proposition 13 has had this effect. (Interestingly, another inadvertent consequence of Proposition 13 has probably been to reduce housing unaffordability problems, at least at the margins, by slowing the turnover of owner-occupied housing, thus reducing not only property tax payments but also mortgage payments.

State legislation can also impose other costs on cities that limit their abilities to engage in activities that would enhance the attractiveness to attract households and businesses. For example, both Pennsylvania, through Act 111 of 1968, the Policeman and Fireman Collective Bargaining Act, and Michigan, through PA 312, require compulsory and binding arbitration in labor negotiations between cities and their employee unions where the city and union both are allowed to select the arbitrator. In both states, city officials complained that the fiscal stress of cities is not taken into account in the arbitration decisions and cities have been frequently saddled with expensive settlements that worsened their long-run situations, creating both an anti-business environment, financial problems, and inflexible administrative machinery. These acts also make it very difficult to reshape municipal workforces in the face of population declines, changes in service demands, or changes in technologies.

In Portland, Seattle and Tacoma, state imposed urban growth boundaries and the non-sprawled urban densities they have brought about have probably helped attract higher-income households to the city, thus enhancing city income, but have also almost certainly had an adverse effect on housing affordability by increasing costs per unit of housing.

On the other hand, to the extent that state fiscal assistance provides cities with the resources to develop community amenities and to improve services (particularly education and police protection), state activity can potentially play an important role in making cities more attractive to middle and higher income households. Although we did hear of various specific instances where state funding had promoted community amenities, we found little evidence that, except for education, state governments were providing large sums of either community development assistance or unencumbered aid to cities. Some states do have assistance directed specifically to cities for community development or amenities, such as Michigan's "Cool Cities" program, but the funding is at a level quite unlikely to produce important changes. Funded at the level of $1 million, the "Cool Cities" program provides cities with grants of $100,000 that the state intends to be catalytic planning grants to bring communities together and help them develop a transformative vision of the future. While the program has been well-received by grant recipients, the transformative benefit of the program is questionable.

Many states do have economic development programs for cities, some of which are targeted to distressed cities. However, these too are unlikely to produce major impacts. Several of the states we visited had programs permitting local governments to grant tax relief as an economic development tool. Michigan and Pennsylvania offer two examples of states that pursue deep abatements rather than fundamental business tax reform. Michigan's Renaissance Zones waive business and residential taxes for 10 to 15 years, prompting one interviewee to call them "enterprise zones on steroids." The state also provides tax relief through its industrial facilities property tax abatement (PA 198), personal property tax abatement (PA 328), Neighborhood Enterprise Zones (locally initiated, provides tax incentives for housing development and improvement), and many other forms of tax relief. In Pennsylvania, some of the people with whom we spoke felt that the Keystone Opportunity Zones (areas designated by a community with state approval that are tax-free at both the local and state levels for business, residents, and property owners) had originally worked well when they were limited and well-targeted.

However, the rapid spread of the tax abatement zones to additional areas across the state, apparently without any coherent vision of where they would be most efficient, has led to a substantial loss of tax revenue for the state and local governments, without necessarily helping those areas that are most in need. It is better to restructure the tax and service environment rather than to engage in "let's make a deal" tax reform.

Many states also have programs aimed at producing affordable housing units. The most common approach is to increase housing production by issuing housing bonds, which reduce the developer's cost by providing tax-exempt financing or low-interest loans. California, for example, issued a $2.1 billion bond in 2002 that included grants to local governments to provide down payment assistance and loans to developers of affordable multi-family housing. Many states also have state housing finance agencies that administer housing trust funds that are capitalized through a variety of sources, including tax-exempt borrowings. These trusts provide funds to developers, nonprofit organizations, and public authorities in the form of low-interest loans and small grants**.** Frequently these funds provided gap financing.

States take different approaches to housing finance. In most states priority goes to low-income housing in mixed-income neighborhoods or developments. In those cases, local governments supplement state funding with a mixture of federal low-income tax credits, Community Reinvestment Act finance pools, tax increment financing, and tax abatement. Some states and localities follow the example of Montgomery County, Maryland, where development density bonuses are granted to developers for units set aside for publicly-owned housing and affordable units.

The commitment and creativity of many of these entities is impressive. However, the scale of these efforts is almost certainly too small to have had much of an impact on housing affordability. In California, for example, we were told by a consultant that the ability to build affordable housing is "anemic at best." For example, a bond passed by San Francisco for $100 million in 1996 resulted in 6 units. Pennsylvania's authorization allowing counties to participate in the Affordable Housing Trust Fund has not been effective at producing more affordable housing, despite the establishment of such funds in51 of 67 counties. Government workers told us that the money had been used more to rehabilitate existing housing than to create new units. Michigan was ranked 48th on per capita spending for housing in *Governing* magazine's 2001

Source Book, spending $23 per capita compared to California, which is ranked 4th and spends $142 per capita[59]. In 2000, the state housing authority programs resulted in the production of 6,061 units with another 3,668 units produced through Low-Income Housing Tax Credits.

State activities to supply affordable housing are often limited. Furthermore, other state action can increase housing costs. Washington's 1990 Condominium Act increased the liability of condominium developers and resulted in a wave of condominium property damage class action lawsuits being filed. This litigation caused most insurance carriers to leave the market and those that remained to charge much more for premiums. This added $20,000 to $30,000 per unit to the cost of condos, encouraging the development of high-end condos, because the premium represents a much smaller portion of the overall cost of the condo. The reduction in production of mid-range condos has led to a supply shortage in this portion of the market. Overall, new construction of condos has decreased significantly, which runs counter to the state policy goals of higher density, mixed use development. The significant 38% drop in all residential building permits in Tacoma between the 1980s and 1990s evidences the effect of this law, since permits for single family homes rose 40% during this time.

Clearly there are activities states have taken that have the potential for positively affecting urban performance. State laws permitting easy annexation and making municipal incorporation difficult as in North Carolina are one example. .Such laws permit cities to capture the wealth and tax base that is emerging just beyond their peripheries. However, in many states, especially the older northeastern states, land on the periphery of cities has long ago been defensively incorporated into suburban municipalities. So states must devise other strategies. In 2000, the Pennsylvania legislature passed the Downtown Local Law to direct state buildings and state leased-space into downtowns. Governor Rendell signed Executive Order 2004-2, the Utilization of Commonwealth-Owned and Leased Space, to reinforce the direct intent of the Downtown Local Law. The Executive Order asserts that "agency heads are strongly encouraged to lease space in downtown areas, whenever possible," noting that Pennsylvania at the time owned approximately 11,000 buildings and its executive agencies leased approximately another 700 buildings. .In the state of Washington, the Executive Council for Greater Tacoma was also

[59] Public Sector Consultants, Inc. (May, 2001). *Investing in Affordable Housing in Michigan*.

responsible for convincing the University of Washington to place its Tacoma branch downtown instead of in the suburbs. Michigan's Executive Directive 2003-22 has a similar supportive downtown intent: It encourages adaptive use or rehabilitation of historic buildings or reuse of other buildings within urban areas, use of vacant buildings or land in urban areas, and use and rehabilitation of brownfield areas.

Michigan recently created a state land bank authority and authorized local land bank authorities to assist governments in assembling and clearing title to properties for economic development. This program is viewed as a development and land-use planning tool. It allows land bank authorities to obtain title to vacant or abandoned properties through an improved, faster tax reversion process, clear title to these properties, assemble parcels, and provide them to nonprofit and other developers for community development

There are actions states *could* take that would positively affect urban performance. Allowing public school choice across district boundaries would help delink residence in the city from the poor quality of city public schools, thus reducing the disincentive for households with children to locate in cities. The most interesting example of the latter was in Michigan where in 1997, legislation was enacted implementing a "schools of choice" program. This inter-district public school choice program enables students to attend schools in a neighboring district if the receiving district agrees to participate in the program. The incentive for participation is that the receiving district receives the full state foundation grant for that child. Lansing is noted as having the most dynamic local schooling market in Michigan with the largest percentage of students in districts outside Lansing. Only fifty-five percent of the students in the Lansing School District attended their neighborhood school in 2004.[60] Students in schools of choice in the Lansing area have increased from 900 in Fall 2000 to 2095 in Fall 2004[61]. However, the program is limited by the necessity of suburban schools to participate[62].

In summary, while it is possible to identify state actions that would positively affect urban performance with respect to population, income and housing affordability, it is difficult to

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[60] Arsen, David, David Plank, & Gary Sykes (July 2002*). Working Paper #10: School Choice Policies: How Have They Affected Michigan's Education System.*

[61] "What's In a School," provided by the Lansing Deputy Mayor.

[62] Minnesota has a statewide public school choice program, and all districts must participate.

attribute much of the superior performance of cities relative to our models' predictions to state action It is, unfortunately, somewhat easier to identify state actions that contributed to underperformance. We have, however, identified state levers which, if used effectively, would likely have desirable effects on urban performance.[63]

[63] For a discussion of these, see Wolman et al., "States and Their Cities: Partnerships for the Future," Fannie Mae Foundation, 2007.

Appendix 1

Methodology

For this project, we explored how to systematically examine the effects of policy, both positive and negative, on urban performance. We first created a set of indexes to measure urban performance between 1990 and 2000 on a variety of social and economic indicators. We then used these index scores as dependent variables in a set of linear regression models, in which the independent variables were a variety of non-policy indicators. The residuals from these regression models represented the portion of the cities' performance that could be due to state or city policy. These residuals were then used in a series of state fixed-effects models in order to isolate those states that were more likely to have had a significant policy effect on their cities. Finally, we used a more extensive set of regression models to examine city performance on a subset of the components of the indexes.

Measuring Urban Performance

We broadly defined urban performance to be the change in a wide array of economic and social indicators of the well-being of city residents between 1990 and 2000. We used factor analysis to determine how these indicators varied in relation to one another and found that city performance can be evaluated in terms of categories of indicators (factors). Within these categories, the indicators are highly related to one another, but the categories themselves are statistically and intuitively distinct from one another.

Our population of cities consisted of all central cities with populations of more than 50,000 in 1990 (n=325). We collected data on 27 indicators of the economic and social well-being of city residents. (See table 1 for a list of indicators and their definitions.) We were interested in the *change* in city performance, so all the indicators measured change from 1990 to 2000.

We used factor analysis to condense our indicators of city and residential well-being into categories representing broad areas of performance. Three factors were retained, with

eigenvalues ranging from 5.66 to 2.67. (See table 2 for rotated factor loadings and eigenvalues.) The three factors and their highly-loading variables[64] were:

Factor 1: Income and Educational Attainment
Percent with some college
Median household income
Per capita income
Poverty rate
Labor force participation rate
Median rent
Median home value

Factor 2: Population and Employment
Population
Jobs by place of residence
Jobs by place of work

Factor 3: Housing Affordability
Percent of households spending 30% or more of income on housing
Percent of households spending 50% or more of income on housing

The factor that explained the largest proportion of the variance among the indicators (33%) was that most related to income and educational attainment. The three factors cumulatively explained more than 68% of the total variance (see table 2). We created new variables representing city performance in each of the preceding categories by using the factor scores for each factor.

Isolating Policy Effects on Performance

To estimate the maximum possible variation in the categories of urban performance that could be attributed to public policy, we used linear regression to explain the portion of the variation that

[64] Variables considered highly-loading are those with factor loadings of at least ±0.55.

could *not* be attributed to policy (or at least recent policy). A set of non-policy variables measuring the social and economic structures of cities was used to predict performance in each of the four categories. We then assumed that the variation in performance that was not explained by the non-policy variables was the maximum portion of the variation that *could* be due to differences in policy.

The cities' factor scores were the dependent variables in our predictive models of performance, and a set of variables measuring changes in cities' social and economic structures were the independent variables. The economic structure variables included changes in the percent of the labor force that were working in the manufacturing industry as well as the percent in the finance, real estate, and insurance industries. Social structure and demographic variables included changes in the percent of residents who were of working age, the percent who were enrolled in four-year colleges and universities, and the percent who were black (non-Hispanic) or Hispanic. (See Table 3 for a list of independent variables.) We controlled for city characteristics at the beginning of the study period by including measures of these characteristics in 1990 in addition to the change from 1990 to 2000. Also included were controls for cities' climate (average July temperature), for whether or not the cities were state capitals, and for the geographic region of cities. (See Table 4 for the definition of the regional variables used in the analysis.) We thus attempted to explain as much of the variation in the factor scores as possible using this set of non-policy variables. The remaining, or unexplained, portion of the variation is the maximum portion that might be attributed to policy at the national, state, or city levels.

The three predictive models explained a significant amount of the variance in the factor scores, signifying that much of what affected city performance was unrelated to public policy. This was particularly true of the models of the Income and Educational Attainment factor and the Population and Employment factor, in which 66 percent and 56 percent, respectively, of the variation in the factor scores was explained by the non-policy variables. The least predictive of the three models was that of the Housing Affordability factor, but the model's independent variables still explain a respectable 27 percent of the variance in factor scores. Because these regression models were predictive, as opposed to causal, the coefficients on and significance of the independent variables are less important than the models' adjusted-R^2s. However, the three models do suggest some interesting causal relationships that may be explored in the future. (See tables 5 through 7 for the results of the linear regressions.)

Because for our purposes we were primarily interested in policies that differ at the state level, we use state fixed-effects models to separate state-level policy effects from those that may occur at the national or city levels. We regressed the residuals from the three predictive models against a set of state dummy variables. For this, we used the 303 cities that were in the 34 states that had at least three central cities[65]. Each set of residuals was used as the dependent variable in a linear regression with the 34 state dummy variables as independent variables. (The constant term was suppressed in the regressions to eliminate the need to leave out one of the state dummy variables as a reference group.) The state dummy variables with significant coefficients are those in which state-level policy could have played a significant role in the performance of their cities between 1990 and 2000. (See tables 8 through 10 for the fixed-effects regression results.)

Using a statistical significance threshold of 0.1, there were seven significant state dummy coefficients when using the residuals from the Income and Education factor score model, five for the Population and Employment factor, and ten for Housing Affordability. (See table 11.) The low adjusted-R^2s for all three models suggest that most of the variation among states is not explained by state policy (or other state-level effects).

The performance of cities in Colorado, Illinois, Oregon, and Washington exceeded expectations on the Income and Education factor, while those in California, Michigan, and Pennsylvania under-performed on this factor. On the Population and Employment factor, Illinois, North Carolina, and Oregon cities performed well while Pennsylvania and Virginia cities performed more poorly than expected. The interpretation of the Housing Affordability factor is trickier: a positive sign on the state dummy coefficients is related to housing being less affordable in those states. While a lack of affordable housing can be bad for city residents, it is often a sign of a vibrant, competitive city. The Alabama, New Mexico, North Carolina, Pennsylvania, and Washington dummy variables all had positive, significant coefficients in the Housing Affordability model, meaning cities in those states saw a greater decrease (or smaller increase) in housing affordability than was expected. Cities in California, Kansas, Louisiana, Michigan, and

[65] The states that are not included because they had too few central cities are: Alaska, Delaware, District of Columbia, Hawaii, Idaho, Maine, Maryland, Mississippi, Montana, Nebraska, Nevada, New Hampshire, North Dakota, South Dakota, West Virginia, and Wyoming.

Wisconsin saw a larger increase (or smaller decrease) in housing affordability than the model predicted.

Examining Specific Policy Variables

Based on the state fixed-effects models, we chose seven states in which to conduct case studies of state policy effects on city performance. These states were: California, Illinois, Michigan, North Carolina, Oregon, Pennsylvania, and Washington. We chose two cities in each state (one in Oregon) to study based on whether the cities' performance mirrored the overall performance of all the cities in the state. The cities were:

California
- Sacramento
- San Francisco

Illinois
- Aurora
- Chicago

Michigan
- Grand Rapids
- Lansing

North Carolina
- Charlotte
- Durham

Oregon
- Portland

Pennsylvania
- Philadelphia
- Pittsburgh

Washington
- Seattle
- Tacoma

To identify which aspects of performance were most responsible for the outlier status of the chosen states, we ran additional regression models using the highly-loading variables in each factor as dependent variables. These variables were change from 1990 to 2000 in: per capita income, population, and housing affordability at both the 30 percent and 50 percent levels.

Initially, the independent variables we used in these models were the same as those we used to predict the factor scores. However, as we began to conduct our case studies, several participants

suggested further non-policy variables that could have affected city performance. We therefore modified the individual models to account for more non-policy related factors and improve the models' predictive powers. An educational attainment variable and two measures of gross metropolitan product (total and per job) were added to each model, and the dependent population variable was modified to distinguish between the school-aged population and the retirement population. In addition, the level of each indicator in 1990 was added to the model to reflect path dependency. To the income and housing affordability models were added measures of employment rate, and the portion of the population that were non-English-speaking and foreign born. The population model included these three variables as well as a measure of in-migrants. (See table 12). As with the original models, these were meant to be predictive and not structural, allowing us to discount the obvious problems of multicollinearity in the interest of maximizing the models' predictive abilities.

The results of the regression models are shown in Tables 13 through 16. The R^2's for the models range from 0.468 to 0.609, with the housing affordability models being the least predictive. Based on an examination of the residuals from these models, we chose to look at the following specific indicators in each state:

- California – Housing Affordability at the 30% level
- Illinois –Population; Housing Affordability at the 50% level;
- Michigan – Per Capita Income; Housing Affordability at the 50% level;
- North Carolina –Population
- Oregon –Per Capita Income; Housing Affordability at the 30% level;
- Pennsylvania – Per Capita Income; Population; Housing Affordability at both the 30% and 50% levels; and
- Washington – Housing Affordability at the 30% level.

Conclusion

It is difficult to separate out policy effects from the effects of forces over which policymakers have little control. We believe the methodology outlined here can be used to eliminate certain non-policy related causes, and adjusted to address policy effects at the city, state, or even national levels. The regression models used cannot account for every non-policy related factor that could affect urban performance, such as economic trends that affect cities unequally or

environmental factors that are only present in some cities. So while our method cannot pinpoint exactly how certain policies affect urban performance, it can be indicative of how much room there is for policy to influence cities' success.

APPENDIX 1: Table 1 - Indicators of city performance

All variables are measured using the change in well-being from 1990-2000, and all are city-level variables unless otherwise noted.

Variable	Variable label	Definition
Population	chgpop	Total number of residents[1]
Percent with some college	chgsomecoll	Percent of residents aged 25+ with at least some college[1]
Jobs by place of residence	chgemployed	Total number of employed residents[1]
Jobs by place of work	chgjobsmsa	Total number of jobs in cities' MSA[2]
Vacancy rate	chgvacrate	Vacant units as a percent of total units[1]
Building permits	chgpermits	Number of building permits issued over the preceding 10 years[3]
In-migration	chginmig	Number of residents aged 5+ who are in-migrants over the preceding 5 years[4]
Racial segregation	chgbwdissim, chgbwexps, chghwdissim, chghwexps	Black-white and Hispanic-white dissimilarity and exposure indices[5]
Per capita income	chgpercap	Income per capita[4]
Median household income	chgmedhh	Median household income[1]
Poverty rate	chgpovrate	Individuals in poverty as a percent of total residents[1]
Unemployment rate	chgunemp	Percent of labor force that is unemployed[1]
Labor force participation rate	chglabfrc	Percent of residents aged 16+ who are in the labor force[1]
Homeownership rate	chgownrate	Owner-occupied units as a percent of total occupied units[1]
Median home value	chghmval	Median value of owner-occupied units[1]
Median rent	chgrent	Median gross rent[1]
Concentrated poverty	chgtothpn, chgpoorhpn	Percent of all residents living in high-poverty neighborhoods; percent of poor residents living in high-poverty neighborhoods[6]

Housing affordability	chgafford50, chgafford30	Percent of residents spending at least 30% and more than 50% of income on housing[4]
Murder rate	chgmurder	Number of murders per 10,000 residents[7]
Larceny rate	chglarceny	Number of larcenies per 10,000 residents[7]
Income inequality	chgincratio	Ratio of number of households with more than $75,000 in income to the number of households living in poverty[4]
Young adults with no high school degree	chgythnhsd	Percent of residents aged 18-24 without a high school degree or equivalent

Sources: [1] State of the Cities Data Sets, 1990 and 2000 Census data; [2] Bureau of Economic Analysis; [3] Census: Manufacturing, Mining, and Construction Statistics; [4] 1990 and 2000 Census; [5]Mumford Center; [6]Provided by Paul Jargowsky, tabulations based on 1990 and 2000 Census data; [7]Uniform Crime Reports, CJIS.

APPENDIX 1: Table 2 - Rotated Factor Loadings66

See Table 1 for variable labels.

Shaded cells represent highly-loading variables, or those above 0.55.

	Common Factors			
Variable	1	2	3	Uniqueness
chgpop	0.00157	0.95858	0.07211	0.06558
chgsomecoll	0.61275	-0.21230	0.00499	0.57002
chgvacrate	0.00912	-0.35727	0.35298	0.68028
chgmedhh	0.82189	0.35531	-0.19806	0.13458
chgpovrate	-0.59665	-0.13368	0.30279	0.19878
chgemployed	0.31968	0.88310	0.00731	0.11713
chgunemp	-0.19264	0.01296	0.52431	0.61957
chglabfrc	0.65861	-0.13472	0.06456	0.52032
chgrent	0.69489	0.32723	0.27127	0.32646
chghmval	0.76642	0.22037	0.17385	0.31913
chgownrate	0.14390	0.54530	-0.22790	0.61665
chgpercap	0.88206	0.11188	-0.12316	0.18623
chgythnhsd	0.04495	0.14872	0.04058	0.87239
chgjobsmsa	0.33736	0.65334	0.04583	0.41065
chgafford50	-0.12703	0.06408	0.79790	0.24643
chgafford30	0.07090	0.02035	0.89683	0.17922
chginmig	0.43782	-0.30312	0.19272	0.66584
chgbwdissim	-0.10099	0.17616	-0.20943	0.86885
chgbwexps	0.37236	-0.22014	0.16380	0.60581
chghwdissim	0.22533	0.15241	-0.00475	0.39779
chghwexps	0.16200	-0.07122	0.01320	0.34310
chgincratio	0.30456	0.38333	-0.20893	0.56340
chgmurder	0.01758	0.12861	0.15100	0.94006
chglarceny	0.14989	-0.16059	0.19277	0.91308
chgpermits	0.24560	0.09994	0.14330	0.85626
chgtothpn	-0.15090	-0.05452	0.16347	0.12647
chgpoorhpn	-0.11093	0.06279	0.07505	0.16630

[66] Four factors were retained, all with eigenvalues greater than 1. Varimax rotation was used to orthogonally rotate the factors.

Eigenvalue	5.65883	3.42507	2.67161
% of variance	33.11	20.04	15.63
Total variance	33.11	53.15	68.78

APPENDIX 1: Table 3 - Independent variables used in linear regression models

Dependent variables are the set of four factor scores. Most variables represent both level in 1990 and change between 1990 and 2000.

Variable	Variable label	Definition
Percent manufacturing	pctmanuf90, chgmanuf	Percent of the labor force working in the manufacturing industry in 1990[1] Percent of the labor force working in the manufacturing industry[1]Change in percent of the labor force working in the manufacturing industry, 1990-2000
Percent FIRE	pctfire90, chgfire	Percent of the labor force working in the finance, insurance, and real estate industries in 1990[1] Change in percent of the labor force working in the finance, insurance, and real estate industries, 1990-2000
Dependent population	pctdepend90, chgdepend	Percent of residents aged 17 and under or 65 and over in 1990 Change in percent of residents aged 17 and under or 65 and over, 1990-2000
School-age population	chgpct17under	Percent of residents aged 17 and under in 1990 Change in percent of residents aged 17 and under, 1990-2000
Retirement-age population	chgpct65over	Percent of residents aged 65 and over in 1990 Change in percent of residents aged 65 and over, 1990-2000
Average July temperature	avgjulytemp	Average July temperature[2]
Annexed population	pctpopannx	Population annexed 1991-2000 as a percent of total 1990 population[3]
Percent Black	pctblk90, chgpctblk	Percent of residents who are Black, non-Hispanic in 1990[1] Change in percent of residents who are Black, non-Hispanic, 1990-2000
Percent Hispanic	pcthisp90, chgpcthisp	Percent of residents who are Hispanic in 1990[1] Change in percent of residents who are Hispanic,

		1990-2000
College enrollment	pctenroll90	Number of students enrolled in cities' 4-year institutions as a percent of total population in 1990[4]
Average wage	wagperjob90, chgwagperjob	Average wage and salary disbursements per job, MSA level in 1990[5] Change in average wage and salary disbursements per job, MSA level, 1990-2000
City age	cityage	Years in 2000 since city passed 50,000 in population[6]
Capital dummy variable	capital	1= City is state capital
Regional dummy variables	coastse, contfarwest, greatlake, inlandse, noncontfarw, nthmideast, nthneweng, plains, rockymtn, sthneweng, sthwest, newyork	Dummy variables for region state is in (See Table 5 for list of states by region)
Per capita income	percapinc90, chgpercapinc	Personal income per capita in 1990[6] Change in personal income per capita, 1990-2000
Median household income	medhhinc90, chgmedhhinc	Median household income in 1990[1] Change in median household income, 1990-2000
Employment	chgemploy90_00, chgemploy80_90	Percent change in number of employed persons 1990-2000 or 1980-1990
Employment rate	Chgemprate	Employed persons as percent of working-age population[6]
Natural log of employment	lnemp90, lnemp90der	Natural log of number of employed residents and second derivative of natural log
Non-English speakers	Chgpctnoneng	Change in percent of residents with limited/no English, 1990-2000[6]
Foreign-born	chgforborn	Change in percent of residents who are foreign-born, 1990-2000[1]
College degree	pctcolldgr90	Percent of residents with a bachelor's degree[1]
GMP	lngmp_90	Natural log of gross metropolitan product[7]
GMP per job	chggmpperjob	Change in gross metropolitan product per job, 1990-2000[7]
In-migrants	pctinmigrant90	Percent of residents in 1990 who moved into the city between 1985 and 1990
Population	Pctchgpop90_00, pctchgpop80_00	Percent change in population 1990-2000 or 1980-

		1990
Natural log of population	lnpop90, lnpop90der	Population in 1990 as natural log and second derivative of natural log
Housing affordability	housafford30_90, chghouseafford30, houseafford50_90, chghouseafford50	Percent of households spending at least 30% or 50% of household income on housing in 1990 Change in percent of households spending at least 30% or 50% of household income on housing, 1990-2000
Jobs by place of work	chgjobspow90_00, chgjobspow80_90	Percent change in the number of jobs by place of work 1990-2000 or 1980-1990, MSA level
Natural log of jobs by place of work	lnjobspow90, lnjobspow90der	Natural log of number of jobs by place of work in MSA and second derivative of natural log

Sources: [1] State of the Cities Data System, 1990 and 2000 Census data; [2] Federal Research Division of the Library of Congress; [3] Census Boundary and Annexation Survey; [4] Integrated Postsecondary Education Data System; [5] Bureau of Economic Analysis; [6] Census data 1890-2000; [7] Economy.com.

APPENDIX 1: Table 4 - Description of regional dummy variables

Region	Dummy Variable Label	Definition
Coastal Southeast	coastse	Florida, Georgia, North Carolina, South Carolina, Virginia
Continental Far West	contfarwest	California, Nevada, Oregon, Washington
Great Lakes	greatlake	Illinois, Indiana, Michigan, Ohio, Wisconsin, all New York state MSAs west of Albany, all Pennsylvania MSAs west of Philadelphia
Inland Southeast	inlandse	Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Tennessee, West Virginia
Non-continental Far West	noncontfarw:	Alaska, Hawaii
Northern Mideast	nthmideast	New Jersey except those in NY CMSA, New York except those in Great Lakes or New York CMSA, Pennsylvania except those in Great Lakes
Northern New England	nthneweng	Maine, New Hampshire, Vermont
Plains	plains	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
Rocky Mountains	rockymtn	Colorado, Idaho, Montana, Utah, Wyoming
Southern Mideast	sthmideast	Delaware, District of Columbia, Maryland
Southern New England	sthneweng	Connecticut, Massachusetts, Rhode Island
Southwest	sthwest	Arizona, New Mexico, Oklahoma, Texas
New York City CMSA	newyork	New York City CMSA

APPENDIX 1: Table 5 -Linear regression model of Income and Education factor

Dependent variable is the income and education factor score.

Variable	Coefficient	t-statistic	p-value
constant term	1.0486	1.19	0.236
pctmanuf90	0.0286	3.41***	0.001
Chgmanuf	0.0729	2.74***	0.007
Pctfire90	0.0187	0.84	0.403
Chgfire	0.1766	3.74***	0.000
Pctdepend90	-0.0439	-3.45***	0.001
Chgdepend	-0.2175	-9.20***	0.000
Avgjulytemp	-0.0051	-0.65	0.516
Pctpopannx	0.0316	1.98**	0.048
pctblk90	0.0023	0.87	0.386
Chgpctblk	-0.0800	-6.01***	0.000
pcthisp90	-0.0065	-2.11**	0.036
Chgpcthisp	-0.0829	-8.19***	0.000
pctenroll90	-0.0091	-2.04**	0.042
Cityage	0.0030	2.75***	0.006
Capital	-0.1056	-0.93	0.351
Coastse	0.8412	2.37**	0.019
Contfarwest	0.6453	1.72*	0.086
Greatlake	0.8907	2.44**	0.015
Inlandse	1.1021	3.01***	0.003
noncontfarw	-0.2196	-0.39	0.694
Nthmideast	0.2993	0.71	0.478
Nthneweng	0.0339	0.07	0.946
Plains	0.9234	2.46**	0.014
Rockymtn	1.8288	4.62***	0.000
Sthneweng	0.1409	0.36	0.720
Sthwest	1.0502	2.81***	0.005
Newyork	-0.1445	-0.37	0.711
N		325	
R^2		0.6855	
Adjusted R^2		0.6569	

F-statistic $_{(27, 297)}$	23.98 (p-value 0.000)

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level
Regional reference group = Southern Mideast
The highly loading variables on this factor are (all are change from 1990-2000):

- percent of adult residents with some college
- median household income
- per capita income
- poverty rate
- labor force participation rate
- median home value
- median rent

APPENDIX 1: Table 6 - Linear regression model of Population and Employment factor

Dependent variable is the population and employment factor score.

Variable	Coefficient	t-statistic	p-value
constant term	-0.2240	-0.19	0.849
pctmanuf90	-0.0136	-1.28	0.201
Chgmanuf	-0.0118	-0.38	0.705
pctfire90	0.0333	1.22	0.224
Chgfire	-0.0490	-0.90	0.369
Pctdepend90	-0.0690	-4.30***	0.000
Chgdepend	-0.0171	-0.62	0.538
Avgjulytemp	0.0420	4.62***	0.000
Pctpopannx	0.0568	3.06***	0.002
pctblk90	-0.0098	-3.10***	0.002
Chgpctblk	-0.0197	-1.28	0.200
pcthisp90	0.0043	1.22	0.222
Chgpcthisp	0.0351	3.01***	0.003
pctenroll90	-0.0202	-3.77***	0.000
Cityage	-0.0049	-3.78***	0.000
wagprjob90	-0.0001	-2.87***	0.004
chgwagprjob	0.0129	3.41***	0.001
Capital	-0.1986	-1.53	0.127
Coastse	0.3306	0.81	0.421
Contfarwest	0.4695	1.16	0.247
Greatlake	0.2955	0.74	0.458
Inlandse	0.0721	0.17	0.865
noncontfarw	0.9348	1.48	0.141
Nthmideast	-0.1621	-0.34	0.737
Plains	0.2120	0.51	0.607
Rockymtn	0.7683	1.75*	0.080
Sthmideast	0.0027	0.00	0.996
Sthneweng	-0.0768	-0.18	0.858
Sthwest	0.2041	0.48	0.632
Newyork	-0.1360	-0.30	0.763
N		325	

R^2	0.5994
Adjusted R^2	0.5600
F-statistic $_{(29, 295)}$	15.22 (p-value 0.000)

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level
Region reference group = Northern New England
The highly loading variables on this factor are (all are change from 1990-2000):
population
employment by place of residence (city level)
employment by place of work (MSA level)

APPENDIX 1: Table 7 - Linear regression model of Housing Affordability factor

Dependent variable is the housing affordability factor score.

Variable	Coefficient	t-statistic	p-value
constant term	0.8632	0.61	0.539
pctmanuf90	0.0091	0.69	0.494
Chgmanuf	-0.0318	-0.82	0.414
pctfire90	0.0139	0.41	0.684
Chgfire	0.0632	0.93	0.352
Pctdepend90	0.0483	2.41**	0.016
Chgdepend	0.0763	2.21**	0.028
Avgjulytemp	-0.0123	-1.09	0.277
Pctpopannx	0.0404	1.75*	0.081
pctblk90	-0.0062	-1.58	0.116
Chgpctblk	-0.0236	-1.23	0.218
pcthisp90	-0.0091	-2.08**	0.038
Chgpcthisp	0.0251	1.73*	0.085
pctenroll90	0.0284	4.26***	0.000
Cityage	0.0052	3.26***	0.001
wagprjob90	-0.0001	-4.55***	0.000
chgwagprjob	0.0013	0.27	0.789
Capital	0.5747	3.55***	0.000
Coastse	0.3884	1.86*	0.064
Contfarwest	0.6608	3.11***	0.002
Inlandse	0.0756	0.34	0.738
noncontfarw	0.7967	1.23	0.221
Nthmideast	0.7119	1.93*	0.054
Nthneweng	-1.3783	-2.78***	0.006
Plains	-0.3569	-1.73*	0.084
Rockymtn	0.2509	0.87	0.383
Sthmideast	1.1529	2.21**	0.028
Sthneweng	-1.1065	-4.12***	0.000
Sthwest	-0.0547	-0.23	0.822
Newyork	1.2854	3.89***	0.000
N		325	

R^2	0.3371
Adjusted R^2	0.2719
F-statistic $_{(29, 295)}$	5.17 (p-value 0.000)

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level
Region reference group = Great Lakes
The highly loading variables on this factor are (all are change from 1990-2000):
percent of households spending more than 30% of income on housing
percent of households spending more than 50% of income on housing

APPENDIX 1: Table 8 - Linear regression model of residuals from Income and Education factor model

State	Coefficient	t-statistic	p-value
Alabama	-0.159	-0.73	0.469
Arizona	-0.045	-0.20	0.838
Arkansas	0.067	0.25	0.802
California	-0.162	-1.81 **	0.071
Colorado	0.405	2.00 **	0.047
Connecticut	-0.198	-1.04	0.299
Florida	0.029	0.24	0.808
Georgia	0.034	0.14	0.887
Illinois	0.306	1.89 **	0.060
Indiana	0.193	1.08	0.282
Iowa	0.015	0.08	0.936
Kansas	0.278	1.16	0.248
Kentucky	0.004	0.01	0.990
Louisiana	0.212	1.04	0.297
Massachusetts	0.093	0.57	0.566
Michigan	-0.394	-2.43 **	0.016
Minnesota	-0.099	-0.37	0.712
Missouri	-0.044	-0.20	0.841
New Jersey	0.274	1.25	0.213
New Mexico	0.219	0.71	0.479
New York	-0.226	-1.33	0.184
North Carolina	0.198	1.17	0.244
Ohio	0.204	1.42	0.156
Oklahoma	-0.337	-1.26	0.210
Oregon	0.863	2.79 **	0.006
Pennsylvania	-0.301	-1.77 **	0.077
Rhode Island	-0.184	-0.59	0.554
South Carolina	-0.421	-1.57	0.118
Tennessee	-0.098	-0.41	0.684
Texas	0.031	0.32	0.749
Utah	0.198	0.74	0.462

Virginia	-0.096	-0.59	0.555
Washington	0.337	1.66 **	0.098
Wisconsin	0.100	0.62	0.535
N		303	
R^2		0.1553	
Adjusted R^2		0.0486	
F-statistic $_{(34, 269)}$		1.46 (p-value 0.0558)	

** = significant at the 0.10 level

APPENDIX 1: Table 9 - Linear regression model of residuals from Population and Employment factor model

State	Coefficient	t-statistic	p-value
Alabama	0.014	0.06	0.955
Arizona	0.189	0.78	0.327
Arkansas	-0.368	-1.23	0.218
California	-0.159	-1.60	0.112
Colorado	-0.073	-0.32	0.747
Connecticut	-0.177	-0.84	0.401
Florida	-0.135	-1.01	0.312
Georgia	-0.299	-1.12	0.264
Illinois	0.445	2.48 **	0.014
Indiana	-0.146	-0.74	0.462
Iowa	-0.254	-1.20	0.230
Kansas	0.204	0.77	0.445
Kentucky	-0.192	-0.56	0.578
Louisiana	0.320	1.42	0.157
Massachusetts	0.096	0.54	0.592
Michigan	0.181	1.01	0.315
Minnesota	0.156	0.52	0.601
Missouri	-0.050	-0.20	0.838
New Jersey	-0.112	-0.46	0.646
New Mexico	-0.216	-0.63	0.531
New York	-0.138	-0.73	0.464
North Carolina	0.680	3.61 **	0.000
Ohio	0.005	0.03	0.976
Oklahoma	-0.023	-0.08	0.938
Oregon	0.635	1.85 **	0.066
Pennsylvania	-0.448	-2.38 **	0.018
Rhode Island	-0.085	-0.25	0.805
South Carolina	0.194	0.65	0.515
Tennessee	0.143	0.54	0.591
Texas	-0.013	-0.12	0.905
Utah	0.348	1.17	0.244

Virginia	-0.307	-1.71 **	0.088
Washington	0.197	0.88	0.382
Wisconsin	0.137	0.76	0.446
N		303	
R^2		0.1570	
Adjusted R^2		0.0504	
F-statistic $_{(34, 269)}$		1.47 (p-value 0.0501)	

** = significant at the 0.10 level

APPENDIX 1: Table 10 - Linear regression model of residuals from Housing Affordability factor model

State	Coefficient	t-statistic	p-value
Alabama	0.598	1.97 **	0.049
Arizona	-0.492	-1.62	0.105
Arkansas	-0.047	-0.13	0.900
California	-0.253	-2.04 **	0.042
Colorado	0.044	0.16	0.877
Connecticut	-0.182	-0.70	0.488
Florida	-0.082	-0.49	0.622
Georgia	0.070	0.21	0.833
Illinois	0.316	1.41	0.159
Indiana	0.059	0.24	0.813
Iowa	0.307	1.17	0.243
Kansas	-0.689	-2.08 **	0.039
Kentucky	0.199	0.46	0.643
Louisiana	-1.017	-3.63 **	0.000
Massachusetts	-0.157	-0.70	0.484
Michigan	-0.488	-2.18 **	0.030
Minnesota	0.212	0.57	0.568
Missouri	0.178	0.59	0.557
New Jersey	0.398	1.31	0.190
New Mexico	0.713	1.66 **	0.097
New York	0.157	0.67	0.504
North Carolina	0.403	1.72 **	0.087
Ohio	0.023	0.12	0.907
Oklahoma	-0.277	-0.75	0.455
Oregon	0.583	1.36	0.175
Pennsylvania	0.621	2.65 **	0.009
Rhode Island	0.030	0.07	0.944
South Carolina	0.013	0.04	0.972
Tennessee	0.361	1.09	0.277
Texas	0.062	0.47	0.642
Utah	0.151	0.41	0.684

Virginia	-0.254	-1.14	0.257
Washington	1.036	3.69 **	0.000
Wisconsin	-0.549	-2.45 **	0.015
N		303	
R^2		0.2257	
Adjusted R^2		0.1278	
F-statistic $_{(34, 269)}$		2.31 (p-value 0.0001)	

** = significant at the 0.10 level

APPENDIX 1: Table 11 - Significant states in the state fixed-effects regressions by model

Dependent variables are the residuals from the non-policy models of the factor scores; independent variables are the state dummy variables. Statistical significance is at the 0.1 threshold.

State	Income and Education	Population and Employment	Housing Affordability
Alabama			+
Arizona			
Arkansas			
California	-		-
Colorado	+		
Connecticut			
Florida			
Georgia			
Illinois	+	+	
Indiana			
Iowa			
Kansas			-
Kentucky			
Louisiana			-
Massachusetts			
Michigan	-		-
Minnesota			
Missouri			
New Jersey			
New Mexico			+
New York			
North Carolina		+	+
Ohio			

Oklahoma			
Oregon	+	+	
Pennsylvania	-	-	+
Rhode Island			
South Carolina			
Tennessee			
Texas			
Utah			
Virginia		-	
Washington	+		+
Wisconsin			-

APPENDIX 1: Table 12 - Variables used in the regressions

Independent variables	Percent change in population	Percent change in per capita income	Percentage-point change in housing affordability (30%)	Percentage-point change in housing affordability (50%)
Path dependency variable	Change 1980-1990	Level 1990	Level 1990	Level 1990
Change in % manufacturing 90-00	**X**	**X**	**X**	**X**
Change in % FIRE 90-00	**X**	**X**	**X**	**X**
Change in % black 90-00	**X**	**X**	**X**	**X**
Change in % Hispanic 90-00	**X**	**X**	**X**	**X**
Change in % aged 65 and over 90-00	**X**	**X**	**X**	**X**
Change in % aged 17 and under 90-00	**X**	**X**	**X**	**X**
Percent with college degree 1990[1]	**X**	**X**	**X**	**X**
Natural log of 1990 GMP[2]	**X**	**X**	**X**	**X**
Change in GMP per job 90-00[2]	**X**	**X**	**X**	**X**
Average July temperature	**X**	**X**	**X**	**X**
State capitol (dummy, 1=state capitol)	**X**	**X**	**X**	**X**
Region (dummies, reference group=Middle Atlantic)	**X**	**X**	**X**	**X**
City age 1990	**X**	**X**	**X**	**X**
Annexed population 90-00	**X**	**X**	**X**	**X**
College enrollment 1990	**X**	**X**	**X**	**X**
Change in employment rate 90-00[3]	**X**	**X**	**X**	**X**
Change in % non-English speaking 90-00	**X**	**X**	**X**	**X**
Change in % foreign-born 90-00[1]	**X**	**X**	**X**	**X**
Percent in-migrants 1995-2000[3]	**X**		**X**	**X**
Natural log of population 1990 (w/ 2nd derivative) [1]	**X**			

Sources: [1] State of the Cities Data System, Census data 1990 and 2000; [2] Economy.com; [3] U.S. Census 1990 and 2000.

APPENDIX 1: Table 13 - Linear regression model of Change in Per Capita Income

Dependent variable is the percent change in per capita income, 1990-2000.

Variable	Coefficient	t-statistic	p-value
constant term	63.924	3.01	0.003***
Percapinc90	0.0001	0.24	0.814
Pctpopannx	0.508	2.44	0.015**
Pctenroll	-0.015	-0.26	0.792
Cityage	0.027	1.67	0.095*
chgemprate	0.911	5.62	0.000***
chgpctnoneng	-0.875	-1.35	0.179
chgpctforborn	1.133	3.34	0.001***
Chgmanuf	0.169	0.59	0.553
Chgfire	0.460	0.75	0.454
Chgpctblk	-0.560	-3.19	0.002***
Chgpcthisp	-0.708	-3.57	0.000***
chgpct65over	-0.663	-1.95	0.053*
chgpct17under	-2.040	-5.16	0.000***
Pctcolldgr90	0.062	0.72	0.472
avgjulytemp	-0.078	-0.75	0.453
Capital	-1.320	-0.88	0.378
Lngmp_90	-3.535	-0.86	0.392
chggmpperjob	10.359	1.98	0.049**
Coastse	1.077	0.23	0.819
contfarwest	-4.633	-0.97	0.335
Greatlake	-1.868	-0.39	0.694
Inlandse	4.152	0.85	0.396
noncontfarw	-13.623	-1.87	0.063*
nthmideast	-4.985	-0.92	0.356
Nthneweng	-8.749	-1.38	0.170
Plains	-1.530	-0.31	0.754
Rockymtn	1.503	0.29	0.771
Sthneweng	-9.098	-1.79	0.074*
Sthwest	-1.125	-0.23	0.816
Newyork	-12.577	-2.50	0.013**

N	323
R^2	0.5937
Adjusted R^2	0.5520
F-statistic $_{(30,292)}$	14.22 (p-value 0.0000)

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level

Region reference group = South Mideast

APPENDIX 1: Table 14 - Linear regression model of Change in Population

Dependent variable is the percent change in population, 1990-2000.

Variable	Coefficient	t-statistic	p-value
constant term	-0.934	-1.16	0.248
pctchgpop80_90	0.196	7.50	0.000***
pctinmigrant	0.0007	0.70	0.484
lnpop90	0.193	1.49	0.137
lnpop90der	-0.006	-1.26	0.210
Pctpopannx	0.010	3.94	0.000***
Pctenroll	-0.001	-1.00	0.316
Cityage	-0.001	-4.23	0.000***
chgemprate	0.0003	0.15	0.878
chgpctnoneng	0.013	1.68	0.095*
chgpctforborn	0.006	1.55	0.123
Chgmanuf	0.003	0.78	0.434
Chgfire	0.011	1.41	0.160
Chgpctblk	-0.007	-3.27	0.001***
Chgpcthisp	-0.005	-2.09	0.038**
chgpct65over	-0.005	-1.17	0.242
chgpct17under	0.008	1.66	0.098*
pctcolldgr90	0.0003	0.42	0.673
avgjulytemp	0.003	2.45	0.015**
Capital	-0.004	-0.24	0.808
Lngmp_90	-0.138	-2.75	0.006***
chggmpperjob	-0.086	-1.33	0.186
Coastse	-0.273	-0.49	0.626
contfarwest	0.008	0.15	0.881
Greatlake	-0.031	-0.57	0.569
Inlandse	-0.039	-0.67	0.505
noncontfarw	-0.004	-0.04	0.965
Nthmideast	-0.010	-0.15	0.884
Plains	-0.018	-0.32	0.753
Rockymtn	0.055	0.93	0.354
Sthmideast	-0.038	-0.50	0.620

Sthneweng	0.006	0.11	0.913
Sthwest	-0.008	-0.14	0.890
Newyork	-0.003	-0.05	0.964
N		323	
R^2		0.6488	
Adjusted R^2		0.6087	
F-statistic $_{(33,289)}$		16.18 (p-value 0.0000)	

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level

Region reference group = Northern New England

APPENDIX 1: Table 15 - Linear regression model of Change in Housing Affordability at 30%

Dependent variable is the percentage-point change in percent of households spending more than 30% of household income for housing, 1990-2000.

Variable	Coefficient	t-statistic	p-value
constant term	25.546	4.56	0.000
housafford30_90	-0.297	-10.97	0.000***
pctinmigrant	-0.049	-2.44	0.015**
Pctpopannx	0.090	1.58	0.116
Pctenroll	0.119	7.41	0.000***
Cityage	0.003	0.64	0.522
chgemprate	-0.162	-3.65	0.000***
chgpctnoneng	-0.073	-0.41	0.679
chgpctforborn	-0.020	-0.22	0.829
Chgmanuf	-0.030	-0.39	0.697
Chgfire	-0.104	-0.60	0.549
Chgpctblk	-0.017	-0.34	0.731
Chgpcthisp	0.075	1.46	0.147
chgpct65over	-0.005	-0.06	0.956
chgpct17under	0.061	0.60	0.551
pctcolldgr90	-0.012	-0.69	0.488
avgjulytemp	-0.020	-0.72	0.473
Capital	0.464	1.13	0.258
lngmp_90	-2.843	-2.49	0.013**
chggmpperjob	-0.886	-0.62	0.536
Coastse	-1.708	-3.35	0.001***
Greatlake	-2.967	-5.32	0.000***
Inlandse	-3.769	-5.30	0.000***
noncontfarw	-1.002	-0.63	0.532
Nthneweng	-5.618	-4.47	0.000***
Nthmideast	-1.200	-1.25	0.211
Plains	-4.883	-7.34	0.000***
Rockymtn	-1.282	-1.74	0.084*
Sthmideast	-1.629	-1.24	0.217

Sthneweng	-3.285	-4.57	0.000***
Sthwest	-3.321	-5.68	0.000***
Newyork	-0.506	-0.68	0.496
N		323	
R^2		0.4764	
Adjusted R^2		0.4206	
F-statistic $_{(31,291)}$		8.54 (p-value 0.0000)	

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level

Region reference group = Continental Far West

APPENDIX 1: Table 16 - Linear regression model of Change in Housing Affordability at 50%

Dependent variable is the percentage-point change in percent of households spending more than 50% of household income for housing, 1990-2000.

Variable	Coefficient	t-statistic	p-value
constant term	11.820	3.31	0.001
housafford50_90	-0.263	-10.97	0.000***
pctinmigrant	-0.029	-2.25	0.025**
Pctpopannx	0.062	1.69	0.091*
Pctenroll	0.077	7.03	0.000***
Cityage	0.005	1.66	0.098*
chgemprate	-0.154	-5.41	0.000***
chgpctnoneng	-0.053	-0.46	0.642
chgpctforborn	-0.015	-0.26	0.796
Chgmanuf	-0.027	-0.54	0.589
Chgfire	-0.065	-0.58	0.562
Chgpctblk	0.011	0.36	0.721
Chgpcthisp	0.011	0.34	0.733
chgpct65over	0.097	1.60	0.111
chgpct17under	0.078	1.18	0.238
pctcolldgr90	0.019	1.68	0.094*
avgjulytemp	0.001	0.03	0.973
Capital	0.094	0.36	0.721
lngmp_90	-1.983	-2.72	0.007***
chggmpperjob	-1.524	-1.65	0.099*
Coastse	0.599	1.37	0.172
contfarwest	1.282	2.71	0.007***
Greatlake	-0.801	-1.90	0.058*
Inlandse	-0.834	-1.74	0.084*
noncontfarw	0.147	0.13	0.895
Nthneweng	-1.658	-1.93	0.054*
Nthmideast	0.386	0.56	0.579
Plains	-1.631	-3.59	0.000***
Sthmideast	0.617	0.68	0.496

Sthneweng	-0.533	-0.94	0.350
Sthwest	-0.491	-1.14	0.257
Newyork	1.732	2.82	0.005***
N		323	
R^2		0.5193	
Adjusted R^2		0.4681	
F-statistic $_{(31,291)}$		10.14 (p-value 0.0000)	

* = significant at 0.1 level; ** = significant at 0.05 level; *** = significant at 0.01 level

Region reference group = Rocky Mountains

Appendix 2

Hypotheses

INCOME

I. INCOME CHANGE GREATER THAN EXPECTED

H1 *Selective in-migration of higher income households*

H2 *Selective out-migration of the poor*

H3 *Higher than expected increase in income for those who stayed in the city during the entire time*

H4 *Annexation*:

Why did the process(es) that the data are most consistent with occur?

H1 Why did selective in-migration of higher income households occur?

- Metro economy generates more high-wage jobs and attracts higher-income households from outside of the region to hold these jobs, some of whom choose to live in the city
- Households without children (single individuals, young childless couples and empty nesters) moving into the city to take advantage of central city amenities
- Increase in city amenities made city a more attractive place than it previously had been
- Very substantial reductions in crime made the city a more attractive (or less unattractive) place to live
- More housing options for middle and upper income families (luxury apartments, condos, etc) provided opportunities for these families to move into the city that didn't exist in the past

H2 Why did selective out-migration of lower-income households occur?

- Lower-income households pushed out by increase in housing costs in the city
- Reduction in amount of low-income housing through as a result of decline in public housing and federally subsidized housing, condo conversion of low-income housing, or tear-downs in the city between 1990-2000 (DP33)

H3 Why did income of residents increase during time period (1990-2000).

- Greater demand for labor in the metro area forced up wage rates
- The metro area firms became more productive, resulting in wage increases for those employed there
- Change in economic structure resulted in the growth of higher wage occupations
- For increases in household income, reduction in household size more than national average (does not apply to increases in per capita income).
- Low unemployment rate and welfare to work programs increased labor participation rate, bringing formerly unemployed residents into the workforce where they received wages higher than unemployment or welfare benefits.

H4 Why did annexation result in increase in per capita income?

- City annexed land whose residents had higher income than pre-existing city residents

II. INCOME INCREASED LESS THAN EXPECTED**.**

H1 *Selective in-migration of lower- income households:*

H2 *Selective out-migration of the higher-income households:*

H3 *Lower than expected increase in income for those who stayed in the city during the entire time.*

Why did the process(es) that the data are most consistent with occur?

H1 Why did selective in-migration of lower-income households occur?

- High foreign immigration
- Central city served as a social service magnet for the poor
- In-migration of poor from other parts of US

H2 Why did selective out-migration of higher-income households occur?

- Households with school-aged children leave in order to avoid poor quality public schools/schools dominated by poor children
- Escape from high crime rate
- High taxes and poor public services relative to suburban jurisdictions

H3 Why was there a lower than expected increase for those households that remained in the city for the entire period?

- The metropolitan area economy declined as a result of either an adverse economic structure or a decline in its productivity
- The metropolitan area economy declined as a result of a transition to lower paying jobs from either lack of educated workforce in the city to fill new, higher skilled jobs or loss of high wage, low skill jobs

POPULATION

I. POPULATION INCREASE GREATER THAN EXPECTED

H1 *Net natural increase higher than expected.*

H2 *In-migration greater than expected.*

H3 *Out-migration less than expected.*

Why did the process(es) that the data are most consistent with occur?

H1 Why was the net natural increase higher than expected?

- Differential in-migration by ethnic groups with fertility rates higher than the national average.

H2 Why did in-migration increase?

- Job growth in the region attracts people to the region, some of whom choose to live in the city (this in an underlying condition for population growth in the city but not an adequate explanation alone)
- People who moved to the region because of the economic growth and people who were living in the suburbs chose to live in the city because of the city's vibrancy, amenities, and quality of public services
- People, moving to the region or who lived in the suburbs, chose to live in the city because housing was more affordable in the city than in the suburbs
- People, moving to the region or who lived in the suburbs, chose to live in the city because it had a mix of housing options (e.g., lofts for empty nesters or young kids, good housing stock for families, etc.).

- People, moving to the region or who lived in the suburbs, chose to live in the city because the tax/service package was better than in the suburbs or improved relative to the suburbs
- Economic growth attracted foreign immigrants to the region who moved to the city for its social network (e.g., Grand Rapids faith community sponsoring refugees)
- City had a unique culture that attracted and retained residents (e.g., Portland).

H3 Why did out-migration decrease?

- Residents stayed in the city after having children
- Residents stayed in the city because of a substantial reduction in crime
- Residents stayed in the city because of improvement in city's vibrancy, amenities, and quality of public services
- Residents stayed in the city because taxes fell relative to suburbs

II. POPULATION INCREASE LESS THAN (OR DECREASE MORE THAN) EXPECTED

H1 *Net natural increase lower than expected.*

H2 *In-migration less than expected.*

H3 *Out-migration greater than expected*.

Why did the process(es) that the data are most consistent with occur?

H1 Why was the net natural increase lower than expected?

- The fertility rate was lower than the national average (but again, foreign immigrants with high fertility rate could have increased population)

H2 Why was in-migration less than expected?

- Poor economy did not attract people to the region
- People (those moving to the region and those in the region) chose to live in the suburbs rather than the city because of better tax/services mix in the suburbs than in the city
- People chose to live in the suburbs rather than the city because housing was more affordable in the suburbs

- People chose to live in the suburbs rather than the city because of the lack of city vibrancy, poor quality services, no amenities

H3 Why was out-migration greater than expected?

- Loss of jobs or lack of employment opportunities resulted in people leaving the region
- Non-service jobs decentralized to the suburbs and employees followed
- Residents left the city for the suburbs because taxes increased (and/or services decreased) more than in the suburbs
- Residents left the city for the suburbs because of a substantial decline in quality of public schools in the city

Residents left the city for the suburbs because housing was more affordable in the suburbs

HOUSING AFFORDABILITY

I. HOUSING WAS MORE AFFORDABLE THAN EXPECTED (FEWER PEOPLE THAN EXPECTED SPENT MORE THAN 30% or 50% OF THEIR INCOME ON HOUSING)

H1 *Increase in supply of housing*.

H2 *Decrease in demand for housing*.

H3 *State or local activities reduced housing costs*.

H4 *Incomes increased more than housing costs increased*.

Why did the process(es) that the data are most consistent with occur?

H1 Why did the supply of housing increase?

- City's land use planning provided for increase in supply between 1990 and 2000 (e.g., Sacramento's "reserve")
- State or city programs supported production of affordable housing (e.g., California's redevelopment authorities, Charlotte's housing partnership) resulting in an increase in the number of affordable units
- Reduction in environmental constraints as a result of state or local law enabled developers to produce more units.

- Political changes resulted in reducing the constraints or increasing the funding for developing residential property, such as a change to a more development-friendly administration or passage of a housing bond (e.g., San Francisco).

H2 Why did the demand for housing decrease?

- Overall demand decreased as a result of a decrease in population
- The demand for affordable housing units decreased as the low-income households left the city because they could not afford housing
- The demand for affordable housing units decreased as multiple low-income households consolidated into a single housing unit because they could not afford housing

H3 Did State or local activities keep housing costs from increasing?

- Rent control kept housing affordable for those residents living in rent controlled units
- State property tax limitations kept housing costs for those remaining in their homes from increasing as much as they otherwise would have.
- Inclusionary zoning requirements increased the number of affordable units
- Bond issues provided funding for affordable housing (subsidizing costs)

H4 Why did incomes increase more than housing costs?

- Change in economy requiring high skilled workers resulted in residents with higher incomes (either through an increase in residents incomes or in-migration of higher skilled and higher compensated households, possibly accompanied by out-migration of lower skilled and lower paid residents) paying housing prices that still reflected the prior lower income level of the community
- As discussed in B3, state or local laws kept housing costs lower than they otherwise would have been, making a larger percentage of housing affordable as incomes increased.

II. HOUSING WAS LESS AFFORDABLE THAN EXPECTED (MORE PEOPLE THAN EXPECTED SPENT MORE THAN 30% or 50% OF THEIR INCOME ON HOUSING)

H1 *Decrease in supply of housing*.

H2 *Increase in demand for housing*.

H3 *State or local activities increased housing costs.*

H4 *Middle- and upper-income residents chose to pay more than 30% of their incomes to purchase housing as an investment.*

Why did the process(es) that the data are most consistent with occur?

H1 Why did the supply of housing decrease?

- The number of affordable housing units was reduced by State or local action, often in connection with Federal housing programs (HOPE VI?).
- Costs of building were too high for developers to recoup costs at the rates at which they could sell the units, as a result of building codes, environmental restrictions, or labor laws
- The supply of affordable housing units decreased because of conversions or demolitions
- The supply of affordable housing units decreased because housing became more expensive
- Growth controls restricted supply of affordable housing units.

H2 Why did the demand for housing increase?

- An increase in the population resulting from job growth in the region, amenities in the city, etc. (as discussed in Population, Section I, above) increased demand
- An increase in the number of low-income households resulted in a greater demand for affordable housing units

H3 Did State or local activities increase housing costs?

- A greater than average increase in property taxes (or in other components of housing Scosts as a result of state or local action)
- Growth controls and other development controls raised the cost of housing
- Impact fees imposed by the city raised the cost of housing
- State environmental requirements (e.g., CEQA in California) raised the cost of housing

H4 Why did families choose to invest money in housing?

- Middle- and upper-income residents were able to make greater returns on housing investments than on other investments

Appendix 3

Tables

Table 1

Actual and Predicted Population and Change

	Actual Values				
City	Population, 1990	Population, 2000	Percent Change in Population (1990-2000)	Predicted Change in Population (1990-2000)	Difference Between Actual and Predicted Change
Aurora	99,581	142,990	43.6	18.9	24.7
Charlotte	395,934	540,828	36.6	23.3	13.3
Chicago	2,783,276	2,896,016	4.0	3.6	0.5
Durham	136,611	187,035	36.9	21.8	15.1
Grand Rapids	189,126	197,800	4.6	3.6	1.0
Lansing	127,321	119,128	-6.4	0.4	-6.8
Philadelphia	1,585,577	1,517,550	-4.3	-5.7	1.4
Pittsburgh	369,879	334,563	-9.5	-3.9	-5.7
Portland	437,319	529,121	21.0	14.9	6.1
Sacramento	369,365	407,018	10.2	22.5	-12.3
San Francisco	723,959	776,733	7.3	0.01	7.3
Seattle	516,259	563,374	9.1	7.2	1.9
Tacoma	176,664	193,556	9.6	7.0	2.6

Table 2

Actual and Predicted Per Capita Income and Change

	Actual Values				
City	Per Capita Income, 1990	Per Capita Income, 2000	Percent Change in Per Capita Income (1990-2000)	Predicted Change in Per Capita Income (1990-2000)	Difference Between Actual and Predicted Change
Aurora	13,335	22,131	66.0	42.7	23.3
Charlotte	16,793	26,823	59.7	48.6	11.1
Chicago	12,899	20,175	56.4	46.5	9.9
Durham	14,498	22,526	55.4	51.8	3.6

Grand Rapids	12,070	17,661	46.3	51.6	-5.2
Lansing	12,232	17,924	46.5	51.2	-5.0
Philadelphia	12,091	16,509	36.5	40.8	-4.3
Pittsburgh	12,580	18,816	49.6	53.0	-3.4
Portland	14,478	22,643	56.4	54.0	2.4
Sacramento	14,087	18,721	32.9	41.7	-8.8
San Francisco	19,695	34,556	75.5	56.3	19.2
Seattle	18,308	30,306	65.5	54.6	10.9
Tacoma	12,272	19,130	55.9	51.1	4.7

Table 3

Actual and Predicted Housing Affordability at 30% of Income and Change

	Actual Values				
City	Housing Affordability (30%), 1990	Housing Affordability (30%), 2000	Change in Housing Affordability (1990-2000)	Predicted Change in Housing Affordability (1990-2000)	Difference Between Actual and Predicted Change
Aurora	26.08	29.22	3.14	1.11	2.03
Charlotte	26.03	28.71	2.69	2.67	0.02
Chicago	37.29	36.32	-0.97	-0.68	-0.29
Durham	31.11	32.02	0.91	1.68	-0.77
Grand Rapids	28.41	26.21	-2.20	1.08	-3.28
Lansing	27.85	27.36	-0.49	0.54	0.05
Philadelphia	32.06	34.09	2.03	2.92	-0.89
Pittsburgh	32.61	32.78	0.17	0.67	-0.50
Portland	29.16	34.95	5.79	3.65	2.14
Sacramento	36.12	36.54	0.42	1.50	-1.08
San Francisco	39.38	35.22	-4.17	-0.08	-4.09
Seattle	30.60	35.09	4.48	3.04	1.44
Tacoma	31.53	36.74	5.21	2.08	3.13

Table 4

Actual and Predicted Housing Affordability at 50% of Income and Change

	Actual Values				
City	Housing Affordability (50%), 1990	Housing Affordability (50%), 2000	Change in Housing Affordability (1990-2000)	Predicted Change in Housing Affordability (1990-2000)	Difference Between Actual and Predicted Change
Aurora	8.85	9.38	0.53	0.50	0.03
Charlotte	10.01	11.35	1.34	2.42	-1.08
Chicago	18.55	17.76	-0.80	-0.69	-0.11
Durham	12.43	13.90	1.46	1.92	-0.46
Grand Rapids	12.75	11.40	-1.34	-0.20	-1.14
Lansing	14.32	12.11	-2.21	-1.03	-1.18
Philadelphia	16.23	17.72	1.49	1.56	-0.07

Pittsburgh	15.64	16.28	0.64	-0.01	0.65
Portland	11.72	14.37	2.64	2.09	0.55
Sacramento	15.47	16.37	0.90	1.41	-0.51
San Francisco	16.70	15.77	-0.93	0.92	-1.85
Seattle	12.12	14.25	2.13	2.23	-0.10
Tacoma	13.36	15.72	2.37	0.85	1.52

Table 5

Greater Increases Than Expected[67]

City	Population		Income		Housing Unaffordability 30%		Housing Unaffordability 50%	
	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change
Aurora	18.9	43.6	42.7	66.0	1.1	3.1		
Charlotte	23.3	36.6	48.6	59.7				
Chicago			46.5	56.4				
Durham	21.8	36.9						
Grand Rapids								
Lansing								
Philadelphia								
Pittsburgh								
Portland	14.9	21.0			3.7	5.8		
Sacramento								
San Francisco	0.0	7.3	56.3	75.5				

[67] Actual population change at least 5.0 percentage points more than predicted by model; actual per capita income change at least 5.0 percentage points greater than model predicted; actual housing unaffordability change at least 1.4 percentage points higher than model predicted.

Seattle			54.7	65.5	3.0	4.5		
Tacoma					2.1	5.2	0.9	2.4

Table 6

Lower Increases than Expected[68]

City	Population		Income		Housing Unaffordability 30%		Housing Unaffordability 50%	
	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change
Aurora								
Charlotte								
Chicago								
Durham								
Grand Rapids			51.6	46.3	1.1	-2.2		
Lansing	0.4	-6.4	51.2	46.5	0.5	-0.5		
Philadelphia			40.8	36.5	2.9	2.0		
Pittsburgh	-3.9	-9.6	53.0	49.6	0.7	0.2		
Portland								
Sacramento	22.5	10.2	41.7	32.9	1.6	0.4		

[68] Actual population change at least 5.0 percentage points less than predicted by the model; actual per capita income change at least 4.0 percentage points lower than model predicted; actual housing unaffordability change at least 0.5 percentage points lower than model predicted.

San Francisco					-0.1	-4.2		
Seattle								
Tacoma								

Table 7

Change As Expected

City	Population		Income		Housing Unaffordability 30%		Housing Unaffordability 50%	
	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change	Predicted % change	Actual % change
Aurora							0.5	0.5
Charlotte					2.7	2.7	2.4	1.3
Chicago	3.6	4.0			-0.7	-1.0	-0.7	-0.8
Durham			51.8	55.4	1.7	0.9	1.9	1.45
Grand Rapids	3.6	4.6					-0.2	-1.3
Lansing							-1.0	-2.2
Philadelphia	-5.7	-4.3					1.6	1.5
Pittsburgh							-0.0	-0.6
Portland			54.0	56.4			2.1	2.6
Sacramento							1.4	1.9

San Francisco						0.9	-0.9
Seattle	7.2	9.1				2.2	2.1
Tacoma	7.0	9.6	51.1	55.9			

Table 8

Housing Unaffordability by Tenure and Income

Households with Incomes <50% of Median

City Statistics	Households with Incomes <50% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
Charlotte												
Renter	15,565	20,557	72.6%	73.6%	4,992	0.9%	9,633	12,772	44.9%	45.7%	3139	0.8%
Owner	5,950	9,094	61.5%	68.3%	3,144	6.7%	3,402	6,102	35.2%	45.8%	2700	10.6%
All Households	21,515	29,651	69.6%	71.9%	8,136	2.4%	13,035	18,874	42.4%	45.8%	5839	3.4%
Chicago												
Renter	194,154	182,974	73.4%	65.7%	-11,180	-7.7%	121,441	110,019	45.9%	39.5%	-11422	-6.4%
Owner	46,097	65,640	52.3%	67.9%	19,543	15.6%	25,303	44,985	28.7%	46.5%	19682	17.8%
All Households	240,251	248,614	69.4%	66.3%	8,363	-3.1%	146,744	155,004	43.0%	41.5%	8260	-1.4%
Durham												
Renter	8,969	11,049	71.8%	67.4%	2,080	-4.5%	4,972	6,620	39.8%	40.4%	1648	0.5%
Owner	2,152	3,266	55.3%	65.9%	1,114	10.6%	1,152	2,138	29.6%	43.2%	986	13.6%
All Households	11,121	14,315	68.6%	67.0%	3,194	-1.6%	6,124	8,758	37.9%	41.0%	2634	3.2%
Grand Rapids												
Renter	10,498	9,212	78.0%	67.5%	-1,286	-10.4%	6,229	5,330	46.3%	39.6%	-899	-6.7%

City Statistics	Households with Incomes <50% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
Owner	3,658	3,789	54.0%	52.9%	131	-1.1%	1,649	1,983	24.3%	27.7%	334	3.3%
All Households	14,156	13,001	72.0%	63.3%	-1,155	-8.5%	7,878	7,313	41.7%	36.4%	-565	-5.3%
Lansing												
Renter	8,017	6,951	75.1%	66.5%	-1,066	-8.6%	5,147	3,756	48.2%	35.9%	-1391	-12.3%
Owner	2,747	3,007	59.4%	56.6%	260	-2.8%	1,501	1,621	32.5%	30.5%	120	-1.9%
All Households	10,764	9,958	71.1%	63.5%	-806	-7.6%	6,648	5,377	44.7%	34.3%	-1271	-10.4%
Philadelphia												
Renter	80,535	86,411	72.2%	66.0%	5,876	-6.2%	54,464	55,627	72.2%	42.5%	1163	-29.7%
Owner	59,223	61,905	52.8%	54.0%	2,682	1.2%	29,826	35,457	26.6%	30.9%	5631	4.3%
All Households	139,758	148,316	64.0%	61.0%	8,558	-3.0%	84,290	91,084	56.1%	38.0%	6794	-18.1%
Pittsburgh												
Renter	24,819	113	67.8%	64.9%	-24,706	-2.8%	15,701	62	42.9%	41.2%	-15639	-1.7%
Owner	9,508	9,424	59.9%	36.3%	-84	-23.6%	4,730	5,662	29.8%	36.3%	932	6.5%
All Households	34,327	9,537	65.6%	36.6%	-24,790	-28.9%	20,431	5,724	39.8%	36.4%	-14707	-3.5%
Portland												
Renter	26,817	30,031	76.2%	74.2%	3,214	-2.0%	14,773	17,758	41.8%	43.9%	2985	2.0%
Owner	9,828	11,573	61.1%	68.9%	1,745	7.8%	4,871	7,828	30.3%	46.6%	2957	16.3%
All Households	36,645	41,604	72.1%	72.7%	4,959	0.6%	19,644	25,586	39.0%	44.7%	5942	5.7%
Sacramento												

City Statistics	Households with Incomes <50% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
Renter	24,014	25,515	80.4%	73.7%	1,501	-6.7%	15,260	15,242	51.1%	44.0%	-18	-7.1%
Owner	5,904	8,419	51.4%	62.8%	2,515	11.4%	3,670	5,616	31.9%	41.9%	1946	10.0%
All Households	29,918	33,934	74.7%	71.0%	4,016	-3.7%	18,930	20,858	47.4%	43.4%	1928	-3.9%
San Francisco												
Renter	55,122	49,362	74.3%	65.1%	-5,760	-9.2%	32,756	30,768	44.2%	40.6%	-1988	-3.6%
Owner	7,665	11,560	37.8%	58.7%	3,895	20.9%	4,812	8,706	23.7%	44.2%	3894	20.5%
All Households	62,787	60,922	69.8%	63.9%	-1,865	-6.0%	37,568	39,474	41.5%	41.4%	1906	-0.2%
Seattle												
Renter	36,222	35,908	75.0%	71.0%	-314	-4.0%	19,514	20,714	40.4%	40.9%	1200	0.6%
Owner	7,199	9,850	42.1%	63.3%	2,651	21.3%	4,211	6,903	24.6%	44.4%	2692	19.8%
All Households	43,421	45,758	69.5%	69.3%	2,337	-0.2%	23,725	27,617	37.6%	41.8%	3892	4.2%
Tacoma												
Renter	10,455	11,314	74.4%	45.2%	859	-29.2%	6,253	6,779	44.5%	45.2%	526	0.7%
Owner	3,266	3,769	55.9%	67.8%	503	11.9%	1,720	2,624	29.5%	47.2%	904	17.7%
All Households	13,721	15,083	70.0%	50.9%	1,362	-19.2%	7,973	9,403	41.3%	45.8%	1430	4.5%

Table 9

Housing Unaffordability by Tenure and Income

Households with Incomes Between 50% and 80% of Median

City Statistics	Households with Incomes Between 50% and 80% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
Charlotte												
Renter	6,877	8,238	42.5%	36.9%	1,361	-5.6%	469	670	2.9%	3.0%	201	0.1%
Owner	3,554	7,813	34.9%	46.1%	4,259	11.2%	855	2017	8.4%	11.9%	1,162	3.5%
All Households	10,431	16,051	39.9%	41.4%	5,620	1.5%	1,324	2,687	6.4%	9.7%	1,363	3.2%
Chicago												
Renter	33,298	24,100	28.4%	19.80%	-9,198	-8.6%	3,283	3043	2.8%	2.5%	-240	-0.3%
Owner	15,987	35,710	20.1%	43.40%	19,723	23.3%	3,022	11,519	3.8%	14.0%	8,497	10.2%
All Households	49,285	59,810	25.7%	33.89%	10,525	8.2%	6,305	14,562	3.3%	11.6%	8,257	8.3%
Durham												
Renter	1,940	2,479	26.4%	27.30%	539	0.9%	66	200	0.9%	2.2%	134	1.3%
Owner	1,385	2,271	34.6%	42.40%	886	7.8%	260	487	6.5%	9.1%	227	2.6%
All Households	3,325	4,750	29.8%	34.52%	1,425	4.7%	326	687	5.4%	7.1%	361	1.7%
Grand Rapids												
Renter	1,578	1,214	26.0%	17.60%	-364	-8.4%	79	152	1.3%	2.2%	73	0.9%
Owner	1,555	2,058	19.7%	23.70%	503	4.0%	166	252	2.1%	2.9%	86	0.8%

City Statistics	Households with Incomes Between 50% and 80% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
All Households	3,133	3,272	22.9%	21.44%	139	-1.4%	245	404	1.8%	2.6%	159	0.8%
Lansing												
Renter	1,167	492	24.9%	10.10%	-675	-14.8%	42	44	0.9%	0.9%	2	0.0%
Owner	876	1,381	18.3%	23.00%	505	4.7%	77	162	1.6%	2.7%	85	1.1%
All Households	2,043	1,873	22.1%	19.61%	-170	-2.5%	119	206	1.3%	2.3%	87	1.0%
Philadelphi												
Renter	14,313	9,713	34.9%	21.50%	-4,600	-13.4%	1,764	1,175	4.3%	2.6%	-589	-1.7%
Owner	11,136	14,555	14.5%	20.50%	3,419	6.0%	1,613	2,485	2.1%	3.5%	872	1.4%
All Households	25,449	24,268	26.0%	20.90%	-1,181	-5.1%	3,377	3,660	3.2%	3.2%	283	-0.04%
Pittsburgh												
Renter	5,147	20	40.9%	30.2%	-5,127	-10.7%	604	6	4.8%	3.5%	-598	-1.3%
Owner	2,983	3,944	20.4%	28.3%	961	7.9%	702	1,031	4.8%	7.4%	329	2.6%
All Households	8,130	3,964	33.4%	28.2%	-4,166	-5.1%	1,306	1,037	4.8%	7.4%	-269	2.6%
Portland												
Renter	5,845	7,378	29.0%	30.2%	1,533	1.2%	383	904	1.9%	3.7%	521	1.8%
Owner	4,898	9,878	28.5%	48.1%	4,980	19.6%	619	2,834	3.6%	13.8%	2,215	10.2%
All Households	10,743	17,256	28.8%	40.4%	6,513	11.7%	1,002	3,738	2.9%	11.4%	2,736	8.4%
Sacramento												
Renter	7,025	4,796	47.7%	29.5%	-2,229	-18.2%	574	504	3.9%	3.1%	-70	-0.8%
Owner	3,888	5,576	36.2%	43.1%	1,688	6.9%	967	1,436	9.0%	11.1%	469	2.1%

City Statistics	Households with Incomes Between 50% and 80% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
All Households	10,913	10,372	43.6%	36.8%	-541	-6.8%	1,541	1,940	7.1%	9.0%	399	1.9%
San Francisco												
Renter	12,307	14,892	55.1%	37.1%	2,585	-18.0%	2,234	2,569	10.0%	6.4%	335	-3.6%
Owner	2,486	8,100	27.6%	45.2%	5,614	17.6%	1,369	3,656	15.2%	20.4%	2,287	5.2%
All Households	14,793	22,992	50.5%	39.9%	8,199	-10.5%	3,603	6,225	25.2%	26.8%	2,622	1.6%
Seattle												
Renter	9,254	10,833	66.4%	35.7%	1,579	-30.7%	849	1,305	36.2%	4.3%	456	-31.9%
Owner	4,837	7,689	28.3%	46.0%	2,852	17.7%	1,128	2,959	6.6%	17.7%	1,831	11.1%
All Households	14,091	18,522	53.3%	40.0%	4,431	-13.3%	1,977	4,264	19.3%	13.6%	2,287	-5.7%
Tacoma												
Renter	2,480	2,174	36.8%	28.6%	-306	-8.2%	195	312	2.9%	4.1%	117	1.2%
Owner	2,026	3,514	34.7%	52.2%	1,488	17.5%	321	1,010	5.5%	15.0%	689	9.5%
All Households	4,506	5,688	35.9%	43.2%	1,182	7.3%	516	1,322	4.5%	12.4%	806	7.9%

Table 10

Housing Unaffordability by Tenure and Income

Households with Incomes >80% of Median

City Statistics	Households with Incomes Between 80% and 95% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
Charlotte												
Renter	770	1,654	10.9%	4.0%	884.00	-6.9%	49.00	248.00	0.7%	0.6%	199.00	-0.1%
Owner	1,570	9,945	25.3%	10.6%	8,375.00	-14.7%	174.00	1,220.00	2.8%	1.3%	1,046.00	-1.5%
All Households	2,340	11,599	20.6%	9.7%	9,259.00	-10.9%	223.00	1,468.00	2.3%	1.2%	1,245.00	-1.2%
Chicago												
Renter	5,073	8,656	11.5%	4.4%	3,583.00	-7.1%	353.00	984.00	0.8%	0.5%	631.00	-0.3%
Owner	5,416	40,311	13.2%	14.1%	34,895.00	0.9%	615.00	6,004.00	1.5%	2.1%	5,389.00	0.6%
All Households	10,489	48,967	12.4%	12.4%	38,478.00	0.0%	968.00	6,988.00	1.2%	1.9%	6,020.00	0.6%
Durham												
Renter	169	280	5.3%	2.2%	111.00	-3.1%	0.00	25.00	0.0%	0.2%	25.00	0.2%
Owner	692	2,090	30.2%	7.9%	1,398.00	-22.3%	23.00	185.00	1.0%	0.7%	162.00	-0.3%
All Households	861	2,370	25.3%	7.2%	1,509.00	-18.1%	23.00	210.00	1.0%	0.6%	187.00	-0.4%
Grand Rapids												
Renter	49	152	2.1%	1.7%	103.00	-0.4%	7.00	18.00	0.3%	0.2%	11.00	-0.1%
Owner	466	1,173	10.0%	4.2%	707.00	-5.8%	9.00	112.00	0.2%	0.4%	103.00	0.2%

City Statistics	Households with Incomes Between 80% and 95% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
All Households	515	1,325	9.2%	3.9%	810.00	-5.3%	16.00	130.00	0.2%	0.4%	114.00	0.1%
Lansing												
Renter	65	29	3.4%	0.5%	-36.00	-2.9%	0.00	17.00	0.0%	0.3%	17.00	0.3%
Owner	254	530	8.9%	310.0%	276.00	301.1%	23.00	34.00	0.8%	0.2%	11.00	-0.6%
All Households	319	559	7.8%	293.9%	240.00	286.2%	23.00	51.00	0.8%	0.2%	28.00	-0.6%
Philadelphia												
Renter	1,837	2,248	12.1%	3.5%	411.00	-8.6%	243.00	257.00	1.6%	0.4%	14.00	-1.2%
Owner	3,202	7,544	9.1%	4.6%	4,342.00	-4.5%	243.00	820.00	0.7%	0.5%	577.00	-0.2%
All Households	5,039	9,792	10.2%	4.3%	4,753.00	-5.8%	486.00	1,077.00	1.2%	0.5%	591.00	-0.7%
Pittsburgh												
Renter	640	5	13.2%	**3.5%**	-635.00	-9.7%	53.00	1.00	1.1%	**0.2%**	-52.00	-0.9%
Owner	810	2,634	11.5%	5.8%	1,824.00	-5.7%	92.00	318.00	1.3%	0.7%	226.00	-0.6%
All Households	1,450	2,639	12.3%	5.8%	1,189.00	-6.5%	145.00	319.00	1.2%	0.7%	174.00	-0.5%
Portland												
Renter	557	1,322	6.8%	3.9%	765.00	-2.9%	25.00	136.00	0.3%	0.4%	111.00	0.1%
Owner	1,535	12,326	16.2%	14.1%	10,791.00	-2.1%	142.00	1,136.00	1.5%	1.3%	994.00	-0.2%
All Households	2,092	13,648	13.7%	13.1%	11,556.00	-0.6%	167.00	1,272.00	1.3%	1.2%	1,105.00	-0.1%
Sacramento												
Renter	987	1,022	16.6%	3.9%	35.00	-12.7%	30.00	131.00	0.5%	0.5%	101.00	0.0%
Owner	1,599	6,585	26.6%	12.9%	4,986.00	-13.7%	168.00	715.00	2.8%	1.4%	547.00	-1.4%

City Statistics	Households with Incomes Between 80% and 95% of Median											
	Spending >30% on Housing						Spending >50% on Housing					
	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	Percentage Point Change	Number of Households 1990	Number of households 2000	% Spending 1990	% Spending 2000	Change in Household #	%Change
All Households	2,586	7,607	22.8%	11.7%	5,021.00	-11.1%	198.00	846.00	2.5%	1.3%	648.00	-1.2%
San Francisco												
Renter	6,770	8,355	36.2%	8.5%	1,585.00	-27.7%	598.00	590.00	3.2%	0.6%	-8.00	-2.6%
Owner	1,986	16,002	26.4%	20.6%	14,016.00	-5.8%	880.00	3,496.00	11.7%	4.5%	2,616.00	-7.2%
All Households	8,756	24,357	34.0%	16.4%	15,601.00	-17.5%	1,478.00	4,086.00	8.3%	3.9%	2,608.00	-4.3%
Seattle												
Renter	1,413	3,085	12.2%	5.9%	1,672.00	-6.3%	81.00	366.00	0.7%	0.7%	285.00	0.0%
Owner	2,406	15,235	23.5%	16.4%	12,829.00	-7.1%	338.00	2,137.00	3.3%	2.3%	1,799.00	-1.0%
All Households	3,819	18,320	19.3%	14.6%	14,501.00	-4.7%	419.00	2,503.00	2.8%	2.1%	2,084.00	-0.7%
Tacoma												
Renter	327	565	11.5%	4.8%	238.00	-6.7%	43.00	106.00	1.5%	0.9%	63.00	-0.6%
Owner	858	4,563	24.2%	15.5%	3,705.00	-8.7%	32.00	442.00	0.9%	1.5%	410.00	0.6%
All Households	1,185	5,128	20.7%	14.3%	3,943.00	-6.4%	75.00	548.00	1.2%	1.4%	473.00	0.1%