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Have Amenities Become Relatively More Important Than Firm Productivity Advantages in Metropolitan Areas?

Richard Deitz
Jaison R. Abel

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Abstract

We analyze patterns of compensating differentials to determine whether a region's bundle of site characteristics has a greater net effect on household location decisions relative to firm location decisions in U.S. metropolitan areas over time. We estimate skill-adjusted wages and attribute-adjusted rents using hedonic regressions for 238 metropolitan areas in 1990 and 2000. Within the framework of the standard Roback model, we classify each metropolitan area based on whether amenities or firm productivity advantages dominate and analyze the extent to which these classifications change between 1990 and 2000. We then decompose compensating differentials into amenity and firm productivity advantage components and examine how these components change. Empirical results suggest that while the relative importance of amenities appears to have increased slightly between 1990 and 2000, firm productivity advantages continued to dominate amenities in the vast majority of metropolitan areas during this decade.

Key words: compensating differentials, quality of life, productivity

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Deitz: Federal Reserve Bank of New York. Abel: Federal Reserve Bank of New York. Address correspondence to Richard Deitz (e-mail: richard.deitz@ny.frb.org).

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I. INTRODUCTION

The traditional view of cities emphasizes the importance of firm productivity advantages, such as access to natural resources or a transportation hub, as the foundation for urban growth and development. To the extent that household location decisions are considered endogenous, a key source of such productivity advantages—agglomeration arising from urban density—is considered a disamenity to households; for example, in the form of higher rents, longer commutes, or more crime. Thus, according to this view, cities primarily provide production advantages to firms and consumption disadvantages to households.

Recently, however, researchers have argued that quality of life, including various urban amenities and climate, has become a leading determinant of household location decisions and an important driver of regional growth. For example, Glaeser, Kolko, and Saiz (2001), coin the term "Consumer City," arguing that cities are increasingly oriented around consumption amenities rather than productivity advantages. In addition, they provide some evidence that high amenity cities have grown faster than low amenity cities since at least the 1980s. Following this line of argument, Glaeser and Gottlieb (2006) document the rising importance of urban amenities to the resurgence of large cities during the 1990s. In addition, Rappaport (2007) has shown that population growth in the U.S. has been more rapid in places with nice weather, a valuable location-specific consumption amenity.

A common hypothesis offered to explain the increasing importance of quality of life to urban development patterns is that the demand for consumption amenities has increased as incomes and education levels have risen nationwide. If this is true, quality of life should be increasingly important in driving differences in growth across locations over time. A natural question that arises out of these views of urban development is whether there has been a fundamental shift in the importance of amenities relative to firm productivity advantages in urban areas. That is, have amenities become a more dominant actor shaping the development of urban areas, or do firm productivity advantages dominate? We attempt to answer this question empirically.

We estimate compensating differentials to examine the relative importance of amenities and firm productivity advantages for a large sample of U.S. metropolitan areas over time. Compensating differentials in wages and rents reflect differences in location characteristics that benefit households and firms. Site-specific amenities that increase the utility of households reduce wages and increase rents, while locational advantages in productivity that increase the profitability of firms bid up both wages and rents. While these two forces act simultaneously, within the context of the standard Roback model, we infer which effect is dominant over time. Further, by analyzing changes in the patterns of compensating differentials, we can examine whether amenities have become relatively more important than firm productivity advantages in U.S. metropolitan areas. Thus, while much of the compensating differentials literature has focused on a single point in time (see, e.g., Bloomquist, Berger, and Hoehn 1988; Beeson and Eberts 1989, and Gyourko and Tracy 1991, among others), our work also contributes to a relatively recent literature analyzing the extent and source of changes in compensating differentials over time (see, e.g., Gabriel, Mattey, and Wascher 2003; Gabriel and Rosenthal 2004; and Shapiro 2006).

Specifically, we estimate the standard Roback model and its parameters using census data from 1990 and 2000. For each census year, we utilize hedonic regressions to estimate skill-adjusted wages and attribute-adjusted rents for 238 metropolitan areas, and classify each metropolitan area based on whether amenities or firm productivity advantages dominate using a framework proposed by Beesen and Eberts (1987). In particular, based on the relative values of a metropolitan area's wage and rent differentials vis-à-vis the national average, we classify the metropolitan areas into four groups: "High Productivity," "Low Productivity," "High Amenity," and "Low Amenity." We then analyze the extent to which these classifications change between 1990 and 2000. Finally, we decompose our estimated wage and rent compensating differentials into amenity and productivity components for each metropolitan area, and examine how these components change over time. We find that more metropolitan areas are classified as either "High Amenity" or "Low Amenity" locations in 2000 than in 1990, and further, that the share of both wage and rent compensating differentials attributable to amenities increased slightly over the period. Thus, our analysis suggests that the relative importance of amenities increased modestly between 1990 and 2000, although productivity effects continued to dominate the majority of metropolitan areas during this decade.

II. CONCEPTUAL FRAMEWORK

Our analysis builds from the well-established model of household and firm location developed by Roback (1982) and extended by Beeson and Eberts (1987, 1989). Identical households choose among locations, and each location is endowed with a bundle of site characteristics, referred to as *amenities*, that affect household utility.[1]

[1] As our analysis examines differences in wages and rents between locations, we adopt the standard modeling assumptions and do not explicitly consider intracity location differences.

Utility is equalized among locations through differences in local wages (*w*) and rents (*r*). Mobile workers of identical skills and tastes are assumed to choose quantities of a composite good and residential land, given the bundle of site characteristics (*s*) that differ among locations. Labor is inelastically supplied and total income is derived only from wages. Expressed via an indirect utility function, where V_0 is a constant level of utility across locations:

$$V(w, r; s) = V_0 \tag{1}$$

Similarly, firms choose among locations with site-specific attributes that affect costs, referred to as *productivity advantages*, and profits are equalized among locations through differences in wages and rents. Firms produce a single good in a national market, and capital is mobile across locations. Normalizing the price of the good to one and expressing as an indirect cost function gives:

$$C(w, r; s) = 1 \tag{2}$$

If *s* provides a positive amenity value in a city relative to other locations, $V_s > 0$; and, if *s* provides a productivity advantage to firms relative to other cities, $C_s < 0$.

Equations (1) and (2) can be expressed graphically as a set of isoutility and isocost curves, as shown in Figure 1. Isoutility curves are upward sloping in *w* and *r* since higher wages must offset higher land prices to keep utility constant. Similarly, isocost curves are downward sloping since higher wages must be offset by lower land prices to maintain zero profit. Given standard assumptions of the model, equilibrium conditions in labor and land markets lead to combinations of *w* and *r* for each city relative to the average city, (r^*, w^*). This, in turn, identifies differences in wages and rents between each city and the average, commonly referred to as compensating differentials.

Applying the equilibrium condition and totally differentiating both functions yields estimates of the slopes of both curves as:

$$(dw/ds)^C / (dr/ds)^C = l^h \tag{3}$$

and

$$(dw/ds)^V / (dr/ds)^V = -L^P / N^P \tag{4}$$

where l^h is the quantity of land consumed by households, L^P is the quantity of land used in production by firms, and N^P is the quantity of labor used in production. Land and labor market equilibrium requires $N^P = N$, and that $L^P = L - Nl^h$, where N is the number of workers and L is the land area of the city.

The total wage and rent differentials between a city and the average city, due to its site characteristics, is made up of two components: a productivity component through what can be thought of as a shift of the isocost curve, and an amenity component through what can be thought of as a shift in the isoutility curve. The magnitude of each shift, given the slopes of each curve, determines whether the net wage or rent differential will turn out to be positive or negative. These shifts are, in reality, expressions of the relative position of a given city compared to the average city. Thus, it is possible to decompose wage and rent compensating differentials into an amenity component and productivity advantage component by quantifying shifts in the isoutility curve and isocost curves.

Such a decomposition is represented graphically in Figure 1 for wages, which illustrates a city, A,—shown at (r_A,w_A)—whose bundle of site-specific attributes is associated with a combination of high amenities and low productivity advantages relative to the average city—again, shown at (r^*,w^*). The full wage differential is (w_A-w^*), where (w'-w^*) represents the difference in wages due to an amenity advantage and (w_A-w') represents the wage differential due to the city's productivity disadvantage. In this case, the net result is a wage discount. A similar exercise can be performed in terms of rents, which in the example shown would result in a rent premium resulting from a larger amenity advantage (rent premium) relative to a productivity disadvantage (rent discount). Thus, in this example, the isoutility curve shift is greater than the isocost curve shift.

More formally, equations (3) and (4) can be used to quantify the proportion of observed wage and rent compensating differentials due to a metropolitan area's site-specific amenities and productivity advantages. Since land prices are very difficult to observe, but housing prices are more readily available, we assume that variations in unit housing prices across space reflect only variations in land prices. As such, $k_l=rl^h/w$, where k_l is the share of housing in the consumer's budget.

Therefore,

$$dw/ds = (dw/ds)^C + (dw/ds)^V = l^h (dr/ds)^C - (L^P/N^P)(dr/ds)^V \qquad (5)$$

Employing equations (3) and (4), and expressing in log form:

$$(d\log w/ds)^V = [(L^P/N^P)/(l^h + (L^P/N^P))]\times(d\log w/ds - k_l\, d\log r/ds) \qquad (6)$$

Given the assumption about the relationship between land and housing price changes, equation (6) can be written as:

$$(d\log w/ds)^V = [(rL^P/wN^P)/(rL/wN)]\times(d\log w/ds - k_h\, d\log p_h/ds) \qquad (7)$$

where p_h is unit housing rents and k_h is the share of housing in the consumer's budget. We use equations (3), (4), and (7) to estimate the share of wage and rent compensating differentials due to the shift in each of the isoutility and isocost curves.

Within this framework, it is possible to determine which curve is the dominant actor for a given location simply by observing compensating differentials (Beeson and Eberts 1987). That is, it is possible to classify metropolitan areas based on whether they are dominated primarily by amenities or firm productivity advantages related to their bundle of site characteristics.[2] Specifically, for any metropolitan area with *both* above-average wages and rents or below-average wages and rents, it must be that the shift in the isocost curve is greater than the shift in the isoutility curve. For this reason, metropolitan areas with patterns of wage and rent compensating differentials of this nature are classified as "High Productivity" and "Low Productivity," respectively. Similarly, for any metropolitan area with above-average wages and below-average rents or below-average wages and above-average rents, it must be that the shift in the isoutility curve is greater than the shift in the isocost curve. As such, metropolitan areas with these patterns of wage and rent compensating differentials are classified as "Low Amenity" and "High Amenity," respectively.

Such a classification is depicted in Figure 2, which shows an example of two cities, A (as before) and B, both with above-average amenity value and below-average productivity value. The space on this diagram is divided into quadrants using the average city as the reference point. Locations that fall within the lower-left and upper-right quadrants are dominated by productivity effects, while locations that fall within the

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[2] Classification of this nature assumes linear isoutility and isocost curves around the neighborhood of inquiry and approximately equal slopes over the relevant range of each curve.

upper-left and lower-right quadrants are dominated by amenity effects. Thus, City A would be classified as "High Amenity" because the amenity advantage dominates the productivity disadvantage in this instance. That is, the shift in the isoutility curve is larger than the shift in the isocost curve. In contrast, City B would be classified as "Low Productivity" because the productivity disadvantage dominates the amenity advantage. Classification of this nature provides insight into the relative attractiveness of different locations to firms and households.

III. ESTIMATION OF COMPENSATING DIFFERENTIALS

The data used for our analysis are drawn from the 5 percent Public Use Microdata Sample published as part of the 1990 and 2000 U.S. Census of Populations. We use standard hedonic regression techniques to estimate wage and rent compensating differentials for 238 metropolitan areas in both 1990 and 2000. We estimate these compensating differentials as metropolitan area fixed effects in wage and rent equations that control for observable differences between workers and housing units in each year. Such an approach allows us to estimate the net value of all site-specific location characteristics. Our estimation approach and results for each set of equations are described in more detail below.

A. Wage Equations

Hedonic wage regressions are estimated separately for 1990 and 2000 so as to avoid unnecessary restrictions on the coefficients. The individuals included in our analysis of wage differentials had to meet the following criteria: the person was over 16 years of age, currently employed, reported positive wage income, worked in the previous year, and resided in one of the 238 metropolitan areas in our sample. Individuals in the military were excluded from the analysis. In total, we use nearly 3.5 million observations to estimate our 1990 wage equation and over 4 million observations to estimate our 2000 wage equation.

Our estimation approach follows the standard human capital specification of individual wages. The dependent variable used is the natural log of weekly wages, where weekly wages are measured as reported annual wage income divided by weeks worked within the year. As explanatory variables, we include years of education, years of experience, gender, race, marital status, whether the individual is self-employed, and a number of occupation and industry controls. Finally, we include fixed effects for 238 metropolitan areas to measure the portion of wages explained by a bundle of site-specific characteristics.

The estimated coefficients for our 1990 and 2000 wage equations are reported in Table 1, along with the mean of each explanatory variable. Overall, the empirical models perform well, explaining approximately 40 percent of the variation in weekly wages in each census year. In addition, the estimated coefficients on the explanatory variables are generally significant at conventionally accepted levels and obey standard behavior.

The coefficients on the metropolitan area fixed effects are used to calculate differences in skill-adjusted wages. The top and bottom 20 metropolitan areas in 1990 and 2000 by skill-adjusted wage are reported in Table 2. While metropolitan areas do change places between census years, their broad rankings are relatively stable. For example, sixteen metropolitan areas appear in the top 20 in both 1990 and 2000, while eleven appear in the bottom 20 in both 1990 and 2000. Moreover, for the complete sample of metropolitan areas, the Spearman rank correlation coefficient is 0.93 (p-value <

0.0001) for the 1990 and 2000 fixed effects. The full set of compensating differentials for all 238 metropolitan areas is provided in the Appendix.

B. Rent Equations

The approach used to estimate attribute-adjusted rent differentials follows closely to that described above to estimate skill-adjusted wage differentials. The housing units included in our analysis of rent differentials were restricted to those that reported a positive rent or house value and located in the 238 metropolitan areas in our sample. In total, we use nearly 2.9 million observations to estimate our 1990 rent equation and almost 3.5 million observations to estimate our 2000 wage equation.

Our house price equations include both owned and rented housing units, which we convert into a common unit of measure. For rented housing units, monthly housing expenditures are self-reported monthly rents plus utilities. For owner-occupied housing units, we impute monthly rent from self-reported housing values using a discount rate of 7.85 percent, a standard estimate used in the literature originally derived by Peiser and Smith (1985), and add monthly utilities.

We regress the log of monthly housing expenditures on observable housing characteristics and a set of 238 metropolitan area fixed effects variables to measure the portion of housing expenditures explained by a bundle of site-specific characteristics. Observable housing characteristics include whether the housing unit is located in a city, whether the housing unit is a condominium, whether the housing unit is used commercially, as well as structural attributes such as the number of rooms, number of bedrooms, and lot size. We also include controls for whether the housing unit was owned or rented, the age of the housing unit, the style of the housing unit, heat source (e.g., gas, oil, electric), water source (e.g., public, well), and sewer source (public, septic tank).[3]

The estimated coefficients for our 1990 and 2000 rent equations are reported in Table 3, along with the mean of each explanatory variable. Again, the empirical models perform well, explaining over 50 percent of the variation in housing expenditures in each census year. In general, the explanatory variables are statistically significant at conventionally accepted levels and generally of the expected sign.

As with the wage equations, the coefficients on the metropolitan area fixed effects are used to calculate differences in attribute-adjusted rents. The top and bottom 20 metropolitan areas in 1990 and 2000 by attribute-adjusted rents are reported in Table 4. Again, the broad rankings of metropolitan areas with respect to attribute-adjusted rents are quite stable. Sixteen metropolitan areas appear in the top 20 in both 1990 and 2000, and twelve metropolitan areas appear in the bottom 20 in both 1990 and 2000. Further, for the complete sample of metropolitan areas, the Spearman rank correlation coefficient is 0.90 (p-value < 0.0001) for the 1990 and 2000 fixed effects. The full set of compensating differentials is provided in the Appendix.

IV. CLASSIFICATION OF METROPOLITAN AREAS BY DOMINANT EFFECT

Using the framework described above, we classify the 238 metropolitan areas in our sample into four groups: “High Productivity,” “Low Productivity;” “High Amenity;” and “Low Amenity” based on each location’s dominant characteristic. This classification relies on a comparison of skill-adjusted wages and attribute-adjusted rents in each metropolitan area relative to the national average.

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3 Data on water and sewer source are not available in the 2000 PUMS data, and thus are not included in our 2000 rent equation.

Figures 3 and 4 plot skill-adjusted wages and attribute-adjusted rents for our complete sample of 238 metropolitan in 1990 and 2000, respectively. A clear positive correlation exists, indicating that among metropolitan areas, when wages tend to be above average, so do rents, and when wages tend to be below average, so do rents. This clearly suggests that productivity differences are the primary driver of wage and rent differentials. The correlation falls, although only slightly, from 0.81 (p-value < 0.0001) to 0.75 (p-value < 0.0001) between 1990 and 2000—a sign that the strength of this relationship may have weakened over this decade.

While the general patterns above hold across metropolitan areas, individual metropolitan areas can differ substantially with respect to the dominant effect underlying observed wage and rent differentials. We classified metropolitan areas into the four groups discussed above when both skill-adjusted wages and attribute-adjusted rents were statistically different from the national average, leaving the remaining metropolitan areas unclassified. Of the 238 metropolitan areas in our sample, we were able to classify 191 in 1990 and 175 in 2000.

Tables 5 and 6 provide a summary of our metropolitan area classifications in 1990 and 2000, respectively. While there are some exceptions, the metropolitan areas we were able to classify generally fall within expected quadrants. For example, in each census year, the wages and rents in metropolitan areas such as Boston, Chicago, New York, San Francisco, and Washington, DC are primarily driven by the high productivity value to firms in these areas, while those in metropolitan areas such as Buffalo, El Paso, Las Cruces, Muncie, and Shreveport are dominated by below-average productivity. There are far fewer metropolitan areas where amenity characteristics are dominant. In metropolitan areas such as Santa Fe and Tucson, wages and rents primarily reflect above-average amenity value to households, whereas Houston, Indianapolis, and Kansas City are dominated primarily by low amenity values.

In addition, our analysis indicates that metropolitan area classifications remained relatively stable over time. Of the 156 metropolitan areas that could be classified in both census years, only 16 change classifications between 1990 and 2000. Table 7 presents a summary of these metropolitan areas that move across categories. In general, the results are not surprising. Between 1990 and 2000, Austin, Charlotte, and Nashville each became a “High Productivity” metropolitan area. In contrast, two metropolitan areas in upstate New York—Rochester and Syracuse, NY—changed classifications from “High Productivity” areas to “Low Productivity” areas, consistent with the general decline experienced in the Northeast during this decade. Interestingly, five metropolitan areas—Eugene, OR; Fort Collins, CO; Provo, UT; Salem, OR, and Wilmington, NC—each changed classifications from “Low Productivity” to “High Amenity” between 1990 and 2000. Such changes are consistent with observed migration patterns away from the Northeast to places with a higher perceived quality of life and relatively nice weather (see, e.g., Glaeser and Shapiro 2003; Glaeser and Saiz 2004; and Rappaport 2007).

V. DECOMPOSITION OF COMPENSATING DIFFERENTIALS

Decomposing our estimated compensating differentials into the portion due to a shift in the isoutility curve and the portion due to a shift in the isocost curve requires estimates of four parameters that are necessary to quantify the slopes of each curve. These parameters are applied to equation (7), which decomposes each metropolitan area’s wage differential as shown in Figure 1. Equations (3) or (4) can then be used to decompose our estimated rent differentials into amenity and firm productivity advantage components.

First, we determine the fraction of the consumer's budget spent on housing, which is procured directly from the data, individualized to each metropolitan area; the average among metropolitan areas is approximately 29 percent in both 1990 and 2000. Second, an estimate of the household budget spent on land is required, and consistent with the existing literature, we rely on an estimate of the ratio of a house's land value relative to the total value of the house from Roback (1982) of 0.196, and apply this ratio to the budget share of housing. Finally, the ratio of land used in production to labor used in production is estimated through available estimates of both the share of national income to land and the share of national income to labor. Following Shapiro (2006), we take these figures from Poterba (1998) to be 10 percent and 75 percent, respectively.

Tables 8 and 9 show the wage decomposition for selected metropolitan areas in 2000. For brevity, we focus on the top and bottom metropolitan areas in terms of both amenities and productivity advantages. While we decompose wages, the rankings are consistent with those procured from the same exercise in terms of rents. In some of the cases, the site characteristics work together to reinforce higher wages, such as a metropolitan area that possesses low amenities and high productivity, whereas in other cases they work in opposition. For example, in State College, PA, a small college town, positive valued amenities produce a wage discount, and its productivity disadvantage to firms reduces the demand for labor and also puts downward pressure on wages. In contrast, in Santa Cruz, CA, the wage discount due to its attractiveness to households is more than offset by its wage premium due to its desirability to firms, resulting in a net wage premium.

As a whole, the rankings in Table 8 tend to conform to expectations, and generally parallel findings from other quality-of-life rankings (Gyourko and Tracy 1991; Gabriel and Rosenthal 2004), with high amenity regions in the West, such as Santa Fe, Santa Barbara, and Santa Cruz, topping the list. It is noteworthy that some of the lowest amenity regions are in warm climates, in places that are often viewed as desirable places to live, such as Las Vegas and Atlanta, which rank low alongside colder rust-belt metropolitan areas such as Flint and Detroit. However, amenities other than climate matter, such as congestion, the availability of cultural attractions, infrastructure, and the mix of local taxes and public services (see, e.g., Bloomquist, Berger, and Hoehn 1988; Gyourko and Tracy 1991; and Haughwout 2002).

Ranked in terms of productivity, the most productive regions tend to be on the East Coast and on the West Coast, consistent with other quality-of-business environment rankings (Gabriel and Rosenthal 2004). As shown in Table 9, Stamford and New York City rank as highly productive, as do many California metros, including San Jose, San Francisco, Santa Cruz, Salinas, and Los Angeles. Among the least productive regions are several metropolitan areas in Pennsylvania and Texas.

Overall, we find that the share of wage compensating differentials attributable to amenities increased slightly from 35.0 percent in 1990 to 37.0 percent in 2000, a change of 5.8 percent. These results are similar to the findings of Beeson and Eberts (1989) who calculated this ratio from their estimates to be 40 percent in 1980. Thus, the majority of the compensating differentials in wages—over 60 percent—are driven by firm productivity advantages, and our findings indicate that this ratio has been relatively stable over the past three decades. On the rent side, the share of rent compensating differentials due to amenities was 30.8 percent in 1990 and rose marginally to 32.1 percent in 2000, a change of 4.4 percent.[4] Evaluated using average values for wages and rents (in constant 2000 dollars), we estimate that the share of total compensating differentials attributable to amenities increased from 33.1 percent in 1990 to 35.0 percent in 2000, a change of 5.6 percent.[5] In addition to the average effects documented above, at the individual level, the share of wage and rent compensating differentials due to amenities increased in 129 of the 238 metropolitan areas in our sample.

Thus, while our decomposition of compensating differentials provides some evidence that the share of wage and rent compensating differentials due to amenities increased slightly between 1990 and 2000, it appears that compensating differentials in U.S. metropolitan areas are dominated by attributes that affect firm location, consistent with our earlier classification of U.S. metropolitan areas.

VI. CONCLUSION

Recently, a body of research has argued that quality of life has become an increasingly important determinant of urban success, and that now more than ever, cities are competing for households based on their relative attractiveness. The empirical results of our study support this view. We derive new estimates of compensating differentials for

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4 A comparable figure for 1980 is not available from Beeson and Eberts (1989).

5 Our estimates of the amenity and productivity components of rent and wage compensating differentials rely on existing parameter estimates used extensively in the compensating differentials literature. As a robustness check that circumvents the need to use any parameters, we also estimate the dollar value of amenity and productivity components as detailed in Gabriel and Rosenthal (2004), which relies solely on total compensating differentials. Using this alternative approach, we find that the amenity and productivity dollar values obtained are quite close to our estimates, and that the amenity share of compensating differentials (in dollar terms) increased from 33.6 percent in 1990 to 36.1 percent in 2000, consistent with our findings.

wages and rents in 1990 and 2000 to assess the relative importance of amenities and firm productivity advantages across a large sample of U.S. metropolitan areas over time. Empirical results suggest that the relative importance of amenities appears to have increased slightly between 1990 and 2000, although productivity effects continued to dominate the majority of metropolitan areas during this decade. This finding is supported indirectly by an increase in the number of metropolitan areas dominated by amenity considerations and more directly by the results of our decomposition of wage and rent compensating differentials. In particular, we estimate that the share of wage compensating differentials attributable to amenities increased slightly from 35.0 percent to 37.0 percent between 1990 and 2000, and the share of rent compensating differentials due to amenities increased marginally from 30.8 percent in 1990 to 32.1 percent in 2000. Further, in dollar terms, we estimate that the share of wage and rent compensating differentials attributable to amenities increased from 33.1 percent to 35.0 percent, or by nearly 6 percent over this period.

While quality of life appears to be an increasingly important consideration, this research indicates that policymakers concerned with economic development should not overlook the fundamental importance of firm productivity advantages to their region. In addition, our analysis suggests that it is difficult to change a region's relative position over a time horizon such as a decade. Indeed, consistent with Gabriel, Mattey, and Wascher (2003), our results indicate that there is a fair degree of inertia over a ten year period, with dominant traits and relative positions changing little over the 1990s. Among our comprehensive sample of metropolitan areas, for example, none moved from being dominated by low amenities to being dominated by high amenities, and only seven low amenity or low productivity regions improved to a high amenity or high productivity region. As more data become available, it may be useful for further research to focus on longer time horizons to gain a better understanding of the extent to which long-term patterns of regional development are influenced by quality of life and firm productivity advantage considerations.

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Table 1: Estimates of Wage Equations

Variable	1990 Wage Equation Mean	1990 Coefficient	1990 T-ratio	2000 Wage Equation Mean	2000 Coefficient	2000 T-ratio
Intercept	--	3.718	202.42	--	4.012	234.91
Education	13.27	0.070	470.06	13.56	0.079	554.03
Experience	18.14	0.056	586.40	19.56	0.055	619.94
Experience squared	494.04	-0.001	-499.03	545.91	-0.001	-535.80
Male = 1	0.54	0.386	479.35	0.53	0.324	415.32
White = 1	0.84	0.069	14.12	0.82	0.064	15.57
Black = 1	0.11	0.008	1.57	0.12	0.007	1.55
Asian = 1	0.04	-0.042	-8.05	0.05	-0.014	-3.25
Married = 1	0.60	0.095	117.60	0.59	0.098	126.23
Not Self Employed = 1	0.96	0.037	19.71	0.96	0.027	15.11
Industry Controls		Yes (12)			Yes (14)	
Occupation Controls		Yes (5)			Yes (6)	
MSA Fixed Effects		238			238	
Dependent Variable (Log of Weekly Wages)	5.92			6.28		
Adjusted R-Squared		0.39			0.38	
Number of Observations		3,464,514			4,038,452	

Note: Numbers in parentheses indicate the number of industry and occupation controls available in each Census year. Differences between Census years due to reorganization of Census data.

Table 2: Top and Bottom 20 MSAs by Skill-adjusted Wage, 1990 and 2000

Rank	1990	2000
1	Stamford	Stamford
2	Anchorage	San Jose
3	Atlantic City	San Francisco
4	New York	Danbury
5	Danbury	Las Vegas
6	Bridgeport	New York
7	San Jose	Bridgeport
8	Washington	Washington
9	San Francisco	Trenton
10	Las Vegas	Anchorage
11	Los Angeles	Monmouth
12	Hartford	Atlantic City
13	Waterbury	Boston
14	Monmouth	Detroit
15	Boston	Chicago
16	Ventura	Hartford
17	Honolulu	Atlanta
18	Trenton	Salinas
19	Brockton	Ventura
20	Salinas	Wilmington (DE)
219	Wichita Falls	Sharon
220	Abilene	El Paso
221	Sharon	Binghamton
222	McAllen	Jacksonville (NC)
223	Terre	Altoona
224	Brownsville	Duluth
225	Champaign	Gainesville
226	Eau Claire	Joplin
227	Lincoln	Bryan
228	Pueblo	McAllen
229	Bloomington (IN)	Waterloo
230	Bryan	State College
231	Springfield (MO)	Abilene
232	Johnstown	Jamestown
233	Joplin	Bloomington (IN)
234	Billings	Columbia (MO)
235	Jacksonville (NC)	Brownsville
236	Fayetteville (AR)	Billings
237	Las Cruces	Las Cruces
238	Provo	Johnstown

Table 3: Estimates of Rent Equations

	1990 Rent Equation			2000 Rent Equation		
Variable	Mean	Coefficient	T-ratio	Mean	Coefficient	T-ratio
Intercept	--	4.202	306.84	--	4.781	427.40
Owned = 1	0.62	0.180	222.78	0.65	0.209	244.36
Located in City = 1	0.26	-0.088	-117.28	0.23	-0.063	-83.28
Condominium = 1	0.06	0.092	72.56	0.04	-0.031	-20.35
Commercial Use = 1	0.02	0.120	56.93	0.02	0.851	388.04
Use Unknown = 1	0.33	0.716	230.81	0.31	-0.084	-9.32
Kitchen = 1	0.99	0.038	10.27	0.99	-0.036	-9.91
Two Rooms = 1	0.04	0.073	20.02	0.05	0.117	36.46
Three Rooms = 1	0.11	0.091	22.90	0.10	0.120	36.27
Four Rooms = 1	0.17	0.161	39.11	0.15	0.144	41.34
Five Rooms = 1	0.20	0.264	62.86	0.19	0.221	61.98
Six Rooms = 1	0.19	0.395	92.53	0.18	0.326	90.03
Seven Rooms = 1	0.12	0.532	122.92	0.12	0.446	121.32
Eight Rooms = 1	0.08	0.660	150.00	0.09	0.561	149.71
Nine Rooms = 1	0.07	0.845	189.61	0.08	0.756	198.60
One Bedroom = 1	0.15	0.060	17.43	0.14	0.021	7.38
Two Bedrooms = 1	0.29	0.180	48.80	0.27	0.151	49.63
Three Bedrooms = 1	0.37	0.206	54.14	0.37	0.183	58.09
Four Bedrooms = 1	0.13	0.249	63.23	0.15	0.253	77.05
Five Bedrooms = 1	0.03	0.287	67.93	0.03	0.333	92.56
Indoor Plumbing = 1	1.00	0.244	60.58	0.99	0.197	50.97
Lot Size 1-9 Acres = 1	0.08	0.093	85.25	0.09	0.161	165.84
Lot Size 10+ Acres = 1	0.02	0.199	109.56	0.02	0.319	144.56
House Age Controls		Yes (7)			Yes (8)	
House Style Controls		Yes (8)			Yes (8)	
Heat Source Controls		Yes (8)			Yes (8)	
Water Source Controls		Yes (3)			No	
Sewer Source Controls		Yes (1)			No	
MSA Fixed Effects		238			238	
Dependent Variable (Log of Monthly Rents)	6.43			6.75		
Adjusted R-Squared		0.58			0.51	
Number of Observations		2,877,009			3,488,649	

Note: Numbers in parentheses indicate the number of housing attribute controls available in each Census year. Differences between Census years due to reorganization of Census data.

Table 4: Top and Bottom 20 MSAs by Attribute-adjusted Rent, 1990 and 2000

Rank	1990	2000
1	Stamford	San Jose
2	San Jose	Stamford
3	Honolulu	Santa Cruz
4	Los Angeles	San Francisco
5	Santa Cruz	Honolulu
6	San Francisco	Salinas
7	Ventura	Santa Barbara
8	Santa Barbara	Ventura
9	Salinas	Santa Rosa
10	Danbury	Los Angeles
11	Santa Rosa	New York
12	New York	Boston
13	Bridgeport	San Diego
14	Boston	Danbury
15	San Diego	Seattle
16	Hartford	Bridgeport
17	Washington	Washington
18	New Haven	Santa Fe
19	Monmouth	Chicago
20	Worcester	Anchorage
219	Odessa	Duluth
220	Eau Claire	Lima
221	Pueblo	Longview
222	Decatur (AL)	Wichita Falls
223	Jackson (MI)	Abilene
224	Muncie	Florence
225	Waterloo	El Paso
226	Lima	Alexandria
227	Terre	Altoona
228	Duluth	Beaumont
229	Sharon	Terre
230	Johnson	Decatur (IL)
231	Anniston	Odessa
232	Florence	Danville
233	Johnstown	Jamestown
234	Altoona	Joplin
235	Brownsville	Anniston
236	Danville	Brownsville
237	Joplin	Johnstown
238	McAllen	McAllen

Table 5: Classification of Metropolitan Areas, 1990

Low Amenity (19)

Augusta
Charlotte
Cincinnati
Columbus (OH)
Flint
Galveston
Grand Rapids
Hamilton
Houston
Indianapolis
Jacksonville (FL)
Kansas City
Macon
Memphis
Nashville
Richland
Rochester (MN)
Rockford
Toledo

High Productivity (66)

Albany (NY)
Allentown
Anchorage
Ann Arbor
Atlanta
Atlantic City
Bakersfield
Baltimore
Boston
Bridgeport
Brockton
Chicago
Dallas
Danbury
Denver
Fort Lauderdale
Fort Pierce
Fresno
Hartford
Honolulu
Lancaster
Las Vegas
Los Angeles
Manchester
Merced
Miami
Minneapolis
Modesto
Monmouth
Nashua
New Bedford
New Haven
New York
Orlando
Philadelphia
Phoenix
Providence
Raleigh
Reading
Reno
Richmond
Riverside
Rochester (NY)
Sacramento
Salinas
San Diego
San Francisco
San Jose
Santa Barbara
Santa Cruz
Santa Rosa
Seattle
Springfield (MA)
Stamford
Stockton
Syracuse
Tacoma
Trenton
Ventura
Vineland
Visalia
Washington
Waterbury
West Palm Beach
Wilmington (DE)
Worcester

Low Productivity (96)

Abilene
Alexandria
Altoona
Amarillo
Anniston
Appleton
Asheville
Baton Rouge
Benton Harbor
Billings
Biloxi
Bloomington (IN)
Bloomington (IL)
Boise
Brownsville
Bryan
Buffalo
Canton
Cedar Rapids
Champaign
Charleston
Chattanooga
Clarksville
Columbia (MO)
Columbia (SC)
Corpus Christi
Danville
Davenport
Daytona Beach
Duluth
Eau Claire
El Paso
Erie
Eugene
Fayetteville (NC)
Fayetteville (AR)
Florence
Fort Collins
Gainesville
Greeley
Green Bay
Greenville (SC)
Houma
Jackson (MS)
Jacksonville (NC)
Jamestown
Johnson
Johnstown
Joplin
Kileen
Knoxville
Lafayette (LA)
Lafayette (IN)
Las Cruces
Lima
Lincoln
Little Rock
Longview
Louisville
Lubbock
McAllen
Mobile
Monroe
Montgomery
Muncie
Ocala
Odessa
Oklahoma City
Omaha
Pensacola
Peoria
Provo
Pueblo
St Cloud
Salem
Salt Lake City
San Antonio
Scranton
Sharon
Sheboygan
Shreveport
South Bend
Spokane
Springfield (MO)
Terre
Tulsa
Tuscaloosa
Tyler
Utica
Waco
Waterloo
Wausau
Wichita Falls
Williamsport
Wilmington (NC)
Youngstown

High Amenity (10)

Albuquerque
Austin
Bellingham
Chico
Lexington
Madison
New Orleans
Olympia
Santa Fe
Tucson

Note: Only those metropolitan areas with skill-adjusted wages and attribute-adjusted rents significantly different from the national average are shown above.

Table 6: Classification of Metropolitan Areas, 2000

Low Amenity (18)

Bakersfield
Birmingham
Elkhart Goshen
Flint
Galveston
Grand Rapids
Hamilton
Houston
Indianapolis
Jacksonville (FL)
Kansas City
Memphis
Reading
Richmond
Rochester (MN)
Rockford
St Louis
Vineland

High Productivity (59)

Anchorage	Las Vegas	Sacramento
Ann Arbor	Los Angeles	Salinas
Atlanta	Manchester	San Diego
Atlantic City	Milwaukee	SanFrancisco
Austin	Minneapolis	San Jose
Baltimore	Modesto	SantaBarbara
Boston	Monmouth	Santa Cruz
Bridgeport	Nashua	SantaRosa
Brockton	Nashville	Seattle
Charlotte	New Bedford	Stamford
Chicago	New Haven	Stockton
Cleveland	New York	Tacoma
Dallas	Orlando	Trenton
Danbury	Philadelphia	Ventura
Denver	Phoenix	Washington
Des Moines	Portland (OR)	Waterbury
Detroit	Providence	West Palm Beach
Fort Lauderdale	Raleigh	Wilmington (DE)
Hartford	Reno	Worcester
Honolulu	Riverside	

Low Productivity (82)

Abilene	Danville	Lafayette (LA)	Pueblo	Williamsport
Alexandria	Davenport	Lafayette (IN)	Roanoke	Youngstown
Altoona	Daytona Beach	Las Cruces	Rochester (NY)	
Amarillo	Decatur (IL)	Lima	St Cloud	
Anniston	Duluth	Lincoln	San Antonio	
Appleton	Eau Claire	Little Rock	Scranton	
Augusta	El Paso	Longview	Sharon	
Benton Harbor	Erie	Lubbock	Shreveport	
Billings	Fayetteville (NC)	Mansfield	Spokane	
Binghamton	Fayetteville (AR)	McAllen	Springfield (IL)	
Brownsville	Florence	Melbourne	Springfield (MO)	
Bryan	Gainesville	Mobile	Syracuse	
Buffalo	Jackson (MS)	Monroe	Terre	
Canton	Jacksonville (NC)	Montgomery	Tulsa	
Cedar Rapids	Jamestown	Muncie	Tuscaloosa	
Champaign	Johnson	Ocala	Utica	
Chattanooga	Johnstown	Odessa	Waco	
Clarksville	Joplin	Oklahoma City	Waterloo	
Columbia (MO)	Kileen	Pensacola	Wausau	
Corpus Christi	Knoxville	Pittsburgh	WichitaFalls	

High Amenity (16)

Albuquerque
Bellingham
Chico
Colorado Springs
Eugene
Fort Collins
Madison
Medford
Norfolk
Provo
Redding
Salem
Santa Fe
Springfield (MA)
Tucson
Wilmington (NC)

Note: Only those metropolitan areas with skill-adjusted wages and attribute-adjusted rents significantly different from the national average are shown above.

Table 7: Summary of Metropolitan Areas Changing Classifications, 1990 to 2000

"High Productivity" to "High Amenity"	Springfield (MA)
"High Productivity" to "Low Productivity"	Rochester (NY), Syracuse
"High Productivity" to "Low Amenity"	Bakersfield, Reading, Richmond, Vineland
"High Amenity" to "High Productivity"	Austin
"Low Productivity" to "High Amenity"	Eugene, Fort Collins, Provo, Salem, Wilmington (NC)
"Low Amenity" to "High Productivity"	Charlotte, Nashville
"Low Amenity" to "Low Productivity"	Augusta

Note: Only those metropolitan areas that changed classifications and with skill-adjusted wages and attribute-adjusted rents significantly different from the national average in both 1990 and 2000 are shown above.

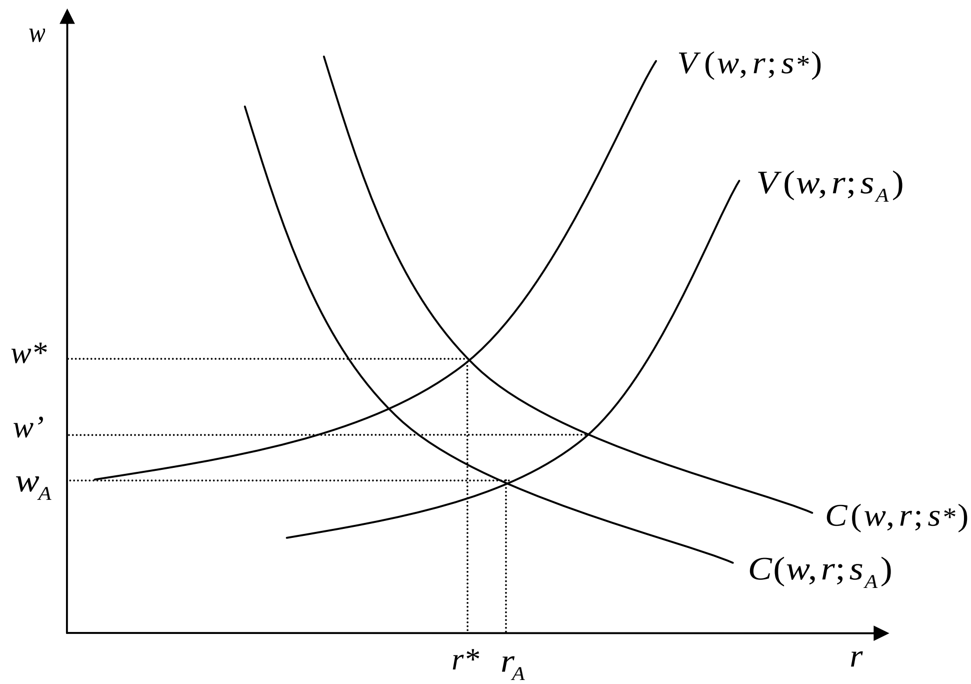
Table 8: Top and Bottom 10 MSAs by Amenity Component of Wage Differential, 2000

	Components of Wage Differential		
Metropolitan Area	Amenity	Productivity	Total
Santa Barbara	-0.095	0.136	0.040
Santa Cruz	-0.091	0.193	0.102
Santa Fe	-0.090	0.029	-0.061
Provo	-0.085	-0.043	-0.127
Eugene	-0.077	-0.022	-0.099
State College	-0.075	-0.081	-0.156
Bloomington (IN)	-0.074	-0.093	-0.168
Chico	-0.073	-0.033	-0.106
Medford	-0.072	-0.017	-0.089
Billings	-0.071	-0.101	-0.172
Vineland	0.067	0.039	0.106
Atlantic City	0.068	0.102	0.170
Dallas	0.069	0.060	0.129
Atlanta	0.070	0.077	0.146
Houston	0.074	0.041	0.116
Detroit	0.076	0.086	0.162
Stamford	0.077	0.320	0.397
Galveston	0.077	0.031	0.108
Flint	0.083	-0.005	0.078
Las Vegas	0.105	0.128	0.233

Table 9: Top and Bottom 10 MSAs by Productivity Component of Wage Differential, 2000

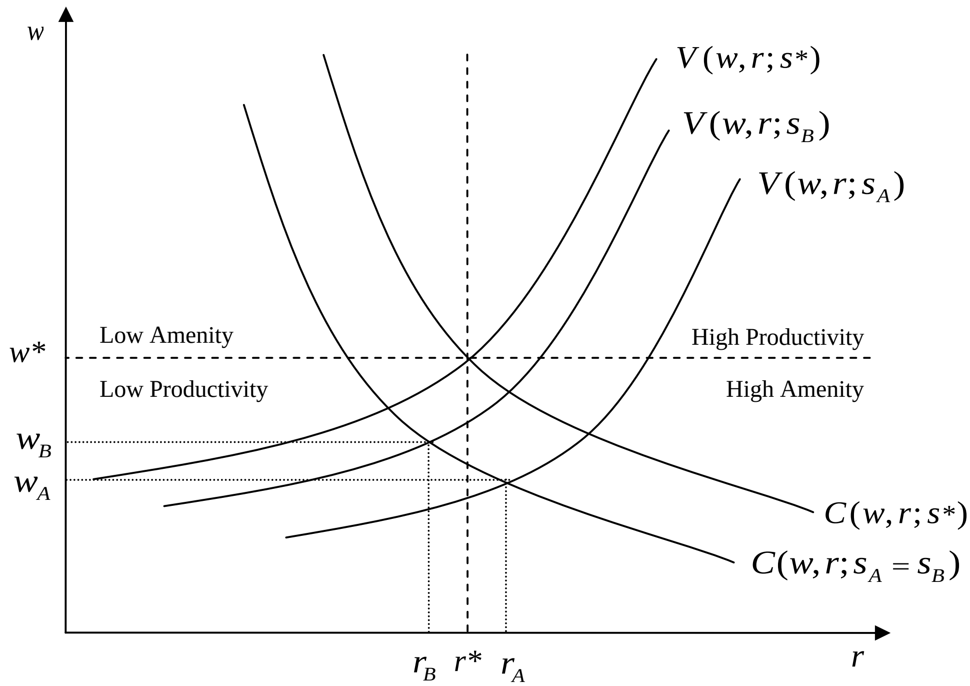
	Components of Wage Differential		
Metropolitan Area	Amenity	Productivity	Total
Stamford	0.077	0.320	0.397
San Jose	0.000	0.295	0.294
San Francisco	0.008	0.241	0.249
Santa Cruz	-0.091	0.193	0.102
New York	0.032	0.186	0.218
Danbury	0.054	0.182	0.237
Salinas	-0.035	0.181	0.146
Ventura	-0.028	0.174	0.145
Bridgeport	0.046	0.165	0.211
Los Angeles	-0.033	0.164	0.132
Altoona	-0.028	-0.105	-0.134
Waterloo	-0.045	-0.105	-0.150
El Paso	-0.025	-0.108	-0.133
Las Cruces	-0.068	-0.114	-0.182
Joplin	-0.026	-0.115	-0.141
Abilene	-0.040	-0.116	-0.157
Jamestown	-0.030	-0.132	-0.163
Johnstown	-0.051	-0.137	-0.188
McAllen	-0.007	-0.139	-0.147
Brownsville	-0.030	-0.141	-0.172

Figure 1: Compensating Differentials in Spatial Equilibrium



Note: Site-specific characteristics assumed to provide above-average amenity value and below-average productivity value.

Figure 2: Classification of Metropolitan Areas by Dominant Effect



Note: Site-specific characteristics assumed to provide above-average amenity value and below-average productivity value.

Figure 3: Plot of Attribute-adjusted Rents and Skill-adjusted Wages by Metropolitan Area, 1990

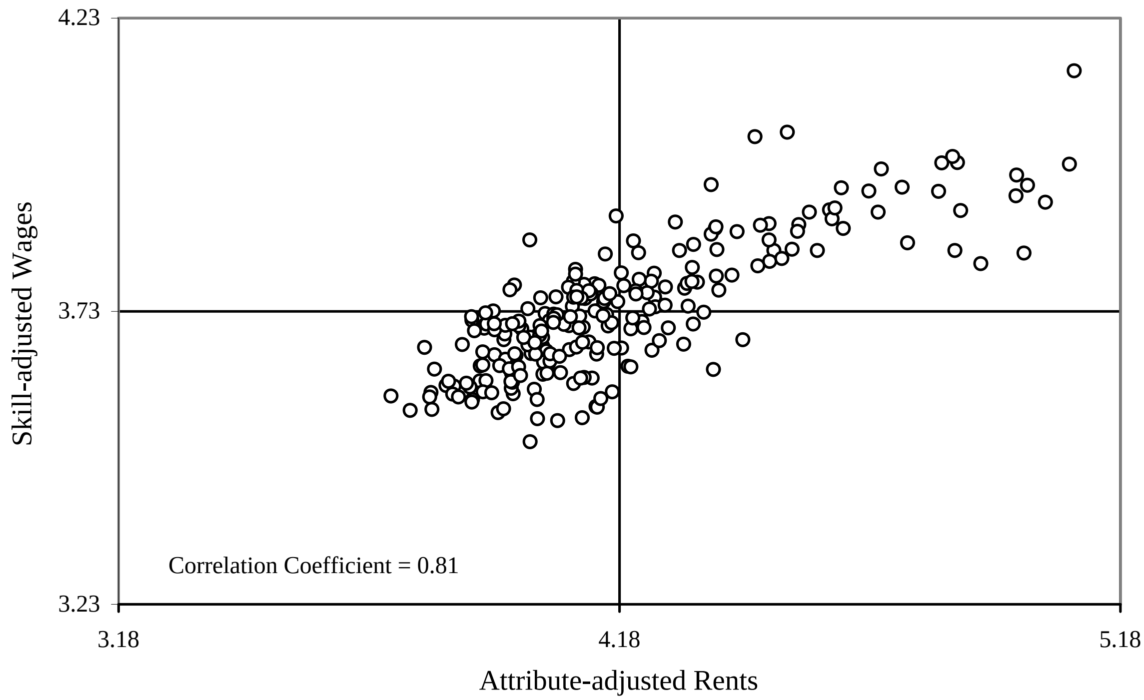
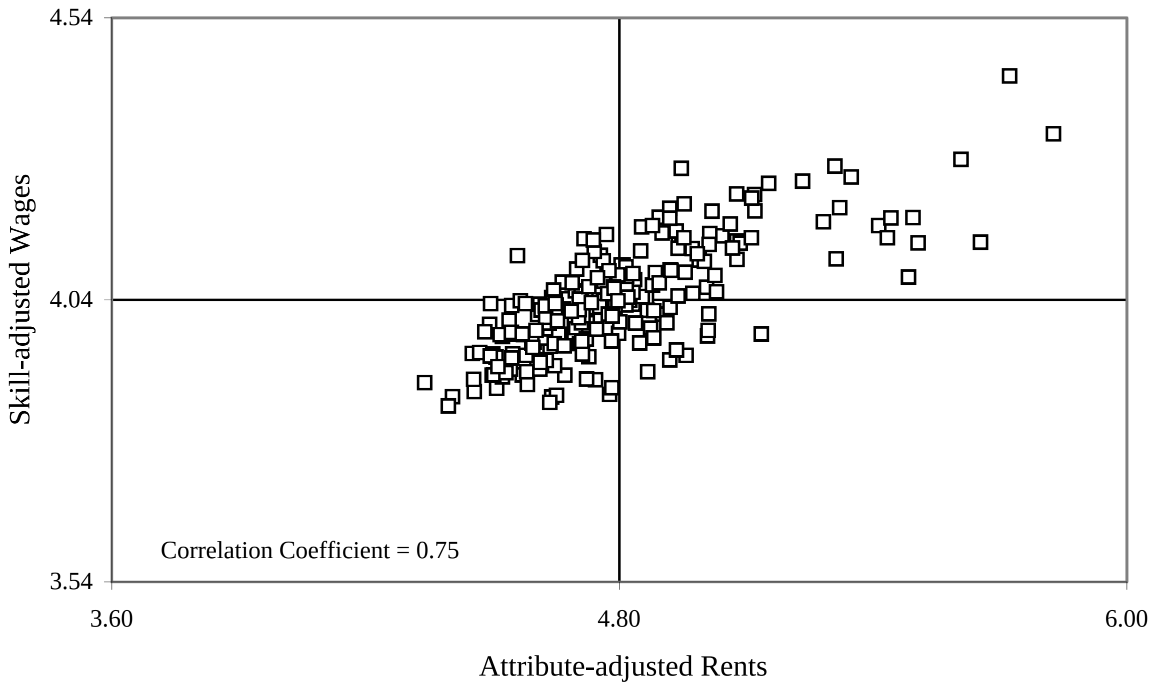


Figure 4: Plot of Attribute-adjusted Rents and Skill-adjusted Wages by Metropolitan Area, 2000



Appendix: Estimated Wage and Rent Differentials, 1990 and 2000

	1990		2000	
Metropolitan Area	Wage Differential	Rent Differential	Wage Differential	Rent Differential
Abilene	-0.141	-0.212	-0.157	-0.290
Akron	-0.006	-0.089	0.005	-0.009
Albany (NY)	0.060	0.193	-0.002	0.010
Albuquerque	-0.067	0.065	-0.051	0.075
Alexandria	-0.119	-0.279	-0.097	-0.299
Allentown	0.036	0.199	0.003	0.018
Altoona	-0.139	-0.376	-0.134	-0.300
Amarillo	-0.075	-0.206	-0.075	-0.201
Anchorage	0.305	0.335	0.186	0.320
Ann Arbor	0.077	0.276	0.104	0.277
Anniston	-0.127	-0.346	-0.096	-0.347
Appleton	-0.060	-0.154	-0.036	-0.075
Asheville	-0.066	-0.100	-0.059	-0.002
Atlanta	0.152	0.111	0.146	0.094
Atlantic City	0.298	0.271	0.170	0.154
Augusta	0.022	-0.157	-0.026	-0.193
Austin	-0.029	0.098	0.070	0.189
Bakersfield	0.114	0.148	0.036	-0.027
Baltimore	0.141	0.192	0.119	0.102
Baton Rouge	-0.025	-0.100	-0.018	-0.080
Beaumont	0.000	-0.252	-0.007	-0.304
Bellingham	-0.057	0.129	-0.064	0.209
Benton Harbor	-0.074	-0.249	-0.055	-0.151
Billings	-0.173	-0.242	-0.172	-0.159
Biloxi	-0.119	-0.266	0.004	-0.160
Binghamton	-0.063	0.005	-0.133	-0.230
Birmingham	0.004	-0.183	0.054	-0.100
Bloomington (IN)	-0.163	-0.047	-0.168	-0.022
Bloomington (IL)	-0.076	-0.155	-0.012	-0.089
Boise	-0.089	-0.141	-0.039	0.002
Boston	0.204	0.637	0.163	0.521
Bremerton	0.012	0.076	0.022	0.207
Bridgeport	0.253	0.644	0.211	0.434
Brockton	0.173	0.420	0.113	0.243
Brownsville	-0.146	-0.379	-0.172	-0.394
Bryan	-0.164	-0.044	-0.142	-0.056
Buffalo	-0.025	-0.022	-0.049	-0.103
Canton	-0.049	-0.231	-0.056	-0.149
Cedar Rapids	-0.048	-0.163	-0.041	-0.089
Champaign	-0.149	-0.037	-0.101	-0.072
Charleston	-0.052	-0.061	-0.008	0.033
Charlotte	0.047	-0.049	0.086	0.051
Chattanooga	-0.031	-0.195	-0.041	-0.151
Chicago	0.149	0.299	0.158	0.320
Chico	-0.099	0.188	-0.106	0.119
Cincinnati	0.044	-0.041	0.062	0.009
Clarksville	-0.106	-0.215	-0.097	-0.205
Cleveland	0.065	0.004	0.035	0.036
Colorado Springs	-0.063	-0.010	-0.025	0.102
Columbia (MO)	-0.133	-0.170	-0.170	-0.148
Columbia (SC)	-0.028	-0.072	-0.014	-0.056
Columbus (OH)	0.030	-0.056	0.062	0.005
Corpus Christi	-0.072	-0.176	-0.029	-0.137
Dallas	0.103	0.120	0.129	0.053
Danbury	0.253	0.675	0.237	0.510
Danville	-0.062	-0.389	-0.094	-0.330
Davenport	-0.039	-0.228	-0.059	-0.153
Dayton	0.008	-0.094	0.009	-0.066
Daytona Beach	-0.073	-0.046	-0.078	-0.094

	1990		2000	
Metropolitan Area	Wage Differential	Rent Differential	Wage Differential	Rent Differential
Decatur (AL)	-0.016	-0.294	-0.010	-0.254
Decatur (IL)	-0.022	-0.267	-0.044	-0.306
Denver	0.024	0.071	0.100	0.286
Des Moines	-0.006	-0.026	0.042	0.018
Detroit	0.162	-0.007	0.162	0.119
Duluth	-0.128	-0.330	-0.137	-0.276
Eau Claire	-0.151	-0.293	-0.123	-0.188
El Paso	-0.132	-0.216	-0.133	-0.297
Elkhart Goshen	-0.004	-0.148	0.031	-0.134
Erie	-0.095	-0.223	-0.106	-0.194
Eugene	-0.114	-0.054	-0.099	0.158
Fayetteville (NC)	-0.105	-0.118	-0.070	-0.078
Fayetteville (AR)	-0.183	-0.163	-0.056	-0.138
Flint	0.122	-0.179	0.078	-0.241
Florence	-0.099	-0.369	-0.102	-0.291
Fort Collins	-0.113	-0.070	-0.054	0.210
Fort Lauderdale	0.131	0.183	0.101	0.140
Fort Myers	0.007	0.072	0.003	0.064
Fort Pierce	0.047	0.048	-0.004	-0.052
Fort Wayne	-0.005	-0.131	-0.008	-0.187
Fresno	0.050	0.156	0.006	0.055
Gainesville	-0.124	-0.091	-0.141	-0.077
Galveston	0.071	-0.087	0.108	-0.083
Grand Rapids	0.022	-0.068	0.020	-0.047
Greeley	-0.099	-0.145	-0.019	0.067
Green Bay	-0.068	-0.145	0.006	0.021
Greensboro	0.001	-0.044	0.012	-0.049
Greenville (SC)	-0.025	-0.201	0.002	-0.121
Hagerstown	0.001	-0.049	0.004	-0.078
Hamilton	0.045	-0.070	0.046	-0.029
Harrisburg	0.016	-0.031	-0.001	-0.037
Hartford	0.211	0.565	0.157	0.220
Hickory	-0.017	-0.140	-0.017	-0.133
Honolulu	0.186	0.850	0.101	0.707
Houma	-0.029	-0.270	-0.002	-0.234
Houston	0.097	-0.028	0.116	-0.031
Indianapolis	0.050	-0.092	0.079	-0.044
Jackson (MI)	-0.009	-0.295	0.017	-0.155
Jackson (MS)	-0.077	-0.139	-0.025	-0.159
Jacksonville (FL)	0.040	-0.102	0.033	-0.037
Jacksonville (NC)	-0.182	-0.074	-0.134	-0.129
Jamestown	-0.138	-0.272	-0.162	-0.343
Janesville	-0.017	-0.200	0.016	-0.104
Johnson	-0.120	-0.341	-0.123	-0.257
Johnstown	-0.168	-0.374	-0.188	-0.404
Joplin	-0.169	-0.417	-0.141	-0.344
Kalamazoo	-0.022	-0.110	-0.018	-0.138
Kansas City	0.035	-0.085	0.069	-0.038
Kenosha	0.022	-0.029	0.026	0.079
Kileen	-0.087	-0.151	-0.083	-0.163
Knoxville	-0.082	-0.227	-0.064	-0.148
Lafayette (LA)	-0.058	-0.182	-0.068	-0.181
Lafayette (IN)	-0.114	-0.077	-0.052	-0.054
Lakeland	-0.006	-0.124	-0.009	-0.149
Lancaster	0.041	0.092	-0.001	0.025
Lansing	-0.008	-0.079	-0.012	-0.046
Las Cruces	-0.187	-0.123	-0.182	-0.164
Las Vegas	0.216	0.183	0.233	0.147
Lexington	-0.030	0.023	-0.009	0.016
Lima	-0.057	-0.314	-0.065	-0.277
Lincoln	-0.151	-0.164	-0.096	-0.087

	1990		2000	
Metropolitan Area	Wage Differential	Rent Differential	Wage Differential	Rent Differential
Little Rock	-0.029	-0.081	-0.025	-0.102
Longview	-0.093	-0.278	-0.062	-0.281
Los Angeles	0.215	0.815	0.132	0.613
Louisville	-0.025	-0.159	0.012	-0.090
Lubbock	-0.108	-0.153	-0.099	-0.220
Macon	0.045	-0.209	-0.007	-0.222
Madison	-0.051	0.080	-0.025	0.212
Manchester	0.147	0.358	0.043	0.226
Mansfield	-0.022	-0.265	-0.062	-0.226
McAllen	-0.145	-0.456	-0.147	-0.460
Medford	-0.094	0.017	-0.089	0.135
Melbourne	-0.020	-0.015	-0.074	-0.089
Memphis	0.029	-0.058	0.085	-0.059
Merced	0.039	0.131	0.013	0.033
Miami	0.061	0.225	0.014	0.230
Milwaukee	0.010	0.091	0.053	0.120
Minneapolis	0.074	0.146	0.104	0.148
Mobile	-0.070	-0.273	-0.052	-0.164
Modesto	0.103	0.309	0.049	0.156
Monmouth	0.205	0.498	0.180	0.314
Monroe	-0.093	-0.239	-0.061	-0.252
Montgomery	-0.043	-0.166	-0.028	-0.116
Muncie	-0.130	-0.298	-0.096	-0.252
Nashua	0.158	0.424	0.117	0.214
Nashville	0.035	-0.061	0.058	0.016
New Bedford	0.105	0.195	0.048	0.085
New Haven	0.169	0.517	0.134	0.263
New Orleans	-0.018	0.046	-0.012	-0.010
New York	0.264	0.666	0.218	0.549
Norfolk	0.009	0.137	-0.042	0.038
Ocala	-0.085	-0.138	-0.076	-0.206
Odessa	-0.034	-0.289	-0.057	-0.318
Oklahoma City	-0.044	-0.178	-0.061	-0.143
Olympia	-0.028	0.049	0.012	0.174
Omaha	-0.045	-0.153	0.001	-0.094
Orlando	0.065	0.070	0.046	0.032
Pensacola	-0.122	-0.213	-0.078	-0.153
Peoria	-0.032	-0.249	-0.018	-0.150
Philadelphia	0.146	0.281	0.122	0.135
Phoenix	0.047	0.135	0.091	0.139
Pittsburgh	-0.012	-0.131	-0.038	-0.137
Portland (OR)	0.016	-0.003	0.071	0.278
Providence	0.085	0.300	0.030	0.095
Provo	-0.223	-0.178	-0.127	0.067
Pueblo	-0.155	-0.294	-0.117	-0.153
Racine	0.022	-0.076	0.044	-0.003
Raleigh	0.051	0.064	0.052	0.123
Reading	0.054	0.039	0.023	-0.072
Redding	-0.022	0.147	-0.068	0.080
Reno	0.136	0.356	0.110	0.312
Richland	0.036	-0.218	0.023	-0.013
Richmond	0.100	0.038	0.051	-0.024
Riverside	0.169	0.380	0.091	0.173
Roanoke	-0.024	-0.227	-0.042	-0.166
Rochester (MN)	0.063	-0.087	0.070	-0.087
Rochester (NY)	0.050	0.145	-0.025	-0.026
Rockford	0.024	-0.091	0.030	-0.111
Sacramento	0.103	0.395	0.092	0.268
Saginaw	-0.003	-0.267	-0.018	-0.184
St Cloud	-0.098	-0.220	-0.084	-0.204
StLouis	0.043	0.009	0.039	-0.052

	1990		2000	
Metropolitan Area	Wage Differential	Rent Differential	Wage Differential	Rent Differential
Salem	-0.073	-0.138	-0.041	0.113
Salinas	0.172	0.681	0.146	0.694
Salt Lake City	-0.077	-0.120	-0.013	0.120
San Antonio	-0.062	-0.085	-0.031	-0.174
San Diego	0.117	0.576	0.073	0.513
San Francisco	0.232	0.793	0.249	0.808
San Jose	0.251	0.899	0.294	1.027
Santa Barbara	0.081	0.721	0.040	0.684
Santa Cruz	0.099	0.808	0.102	0.854
Santa Fe	-0.049	0.246	-0.061	0.336
Santa Rosa	0.103	0.670	0.110	0.634
Sarasota	-0.002	0.168	0.007	0.139
Savannah	0.024	-0.085	0.018	0.017
Scranton	-0.106	-0.144	-0.108	-0.173
Seattle	0.106	0.345	0.138	0.483
Sharon	-0.142	-0.332	-0.129	-0.268
Sheboygan	-0.045	-0.191	-0.029	-0.086
Shreveport	-0.073	-0.209	-0.036	-0.260
South Bend	-0.041	-0.159	-0.004	-0.157
Spokane	-0.073	-0.167	-0.073	-0.018
Springfield (IL)	-0.020	-0.132	-0.032	-0.096
Springfield (MO)	-0.167	-0.231	-0.111	-0.187
Springfield (MA)	0.090	0.325	-0.019	0.081
Stamford	0.410	0.908	0.397	0.923
State College	-0.138	-0.014	-0.156	-0.017
Stockton	0.121	0.299	0.098	0.213
Syracuse	0.031	0.056	-0.038	-0.146
Tacoma	0.035	0.033	0.068	0.201
Tampa	-0.008	-0.033	0.011	-0.027
Terre	-0.146	-0.321	-0.100	-0.305
Toledo	0.024	-0.126	-0.018	-0.095
Trenton	0.176	0.430	0.188	0.277
Tucson	-0.095	0.023	-0.076	0.048
Tulsa	-0.034	-0.155	-0.020	-0.114
Tuscaloosa	-0.095	-0.201	-0.082	-0.130
Tyler	-0.054	-0.168	-0.011	-0.175
Utica	-0.062	-0.044	-0.103	-0.254
Ventura	0.197	0.792	0.145	0.643
Vineland	0.120	0.028	0.106	-0.062
Visalia	0.029	0.033	0.020	-0.012
Waco	-0.120	-0.217	-0.058	-0.255
Washington	0.243	0.523	0.206	0.353
Waterbury	0.210	0.443	0.131	0.079
Waterloo	-0.123	-0.305	-0.150	-0.217
Wausau	-0.092	-0.272	-0.054	-0.197
West Palm Beach	0.144	0.193	0.110	0.153
Wichita	-0.010	-0.098	-0.007	-0.151
Wichita Falls	-0.140	-0.255	-0.119	-0.287
Williamsport	-0.110	-0.198	-0.128	-0.219
Wilmington (DE)	0.136	0.235	0.144	0.120
Wilmington (NC)	-0.053	-0.074	-0.067	0.082
Worcester	0.141	0.447	0.082	0.185
Yakima	-0.021	-0.213	0.004	0.021
York	0.030	-0.019	-0.005	-0.066
Youngstown	-0.022	-0.249	-0.061	-0.229
Yuba	0.004	0.060	-0.002	-0.003
Yuma	-0.012	0.027	-0.029	-0.017