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INDIVIDUAL CHARACTERISTICS, SPATIAL LABOR MARKET DIFFERENCES, AND AMENITY INFLUENCES ON NONMETRO/METRO MIGRATION PATTERNS

Abstract: Previous studies of the linkage of national and regional labor markets have focused on aggregate employment growth and migration. By focusing on the separate effects of national and regional labor market economic conditions on **wages**, this study differs from much of the previous literature. In particular, this paper will extend the previous literature in two key directions. First, it will explore whether local economic activity and location-specific amenities have different effects on metropolitan and nonmetropolitan area wages. Second, it will determine how regional labor labor markets and locality amenities affect metro and nonmetro migration of workers. These issues will be explored using 1979-1996 National Longitudinal Survey of Youth data merged with local labor market measures of amenities and economic conditions. In this preliminary draft, we explore the differential impact of amenities and local economic conditions on wages for metro versus nonmetro workers in the 1988-1993 NLSY sample. Our findings suggest that there are differences in returns to human capital when comparing urban and rural workers. Moreover, compensating differentials for location-specific amenities and local labor market conditions also appear to depend on metro versus nonmetro residence. Similarly, locality amenities and labor market conditions primarily influence both metro and nonmetro migration decisions.

I. Introduction

Two of the most important components of regional science are: (1) the contention that there are spatial distinctions that make regional economies worth studying and (2) regions within a nation are at least loosely connected in terms of an equilibrium adjustment process that tempers regional differences. In a sense, points (1) and (2) are somewhat conflicting.

In examining both of these points, a number of regional labor market studies have emphasized the question of differential roles of people and jobs in determining regional growth. Muth (1971) was among the first to recognize the simultaneity between migration and job growth. This was later explored by Carlino and Mills (1987) and Clark and Murphy (1996). In the migration literature, the debate has been extended to an examination of the differential roles played by site-specific amenities and employment opportunities (Graves and Linneman, 1979; Greenwood and Hunt, 1989; Knapp and Graves, 1989; Greenwood, Hunt, Rickman and Treyz, 1991; Clark and Hunter, 1992). This literature examines the relative importance of place-specific amenities and employment opportunities in generating regional net migration flows. The adjustment speeds of net migration flows and employment growth are often examined as to whether they are primarily an equilibrium or disequilibrium responses. Although the ultimate jobs-versus-people question remains unsettled, this research has greatly aided our understanding of why some regions persistently grow faster than other regions in terms of *employment* and *migration*.

Yet, certain aspects of point (1)– the linkage of national and regional labor markets-- have received much less attention. In particular, in stark contrast to the vast number of studies of employment and migration patterns, the relative importance of national and regional cyclical conditions in determining workers' *wages* is less explored (Abraham and Katz, 1995). For example, it is well known that high-skilled workers are more likely to migrate than low-skilled workers (e.g., Fox et al., 1989). However, it is less clear the extent to which high-skilled wages are more or less influenced by national versus local economic conditions. Moreover, although it has been suggested that location-specific amenities are a normal good that affect migration patterns (Graves and Linnemann; 1979, Knapp and Graves, 1989), an underlying assumption is that all workers are geographically mobile. For

example, some labor markets may be local as rather than national in geographic scope. If some workers (e.g., low skilled workers) work in local labor markets and other workers (e.g., high skilled workers) operate in national markets, then amenity differences may not influence migration behavior for workers in local labor markets in the same way that they do those in national labor markets. Other things equal, the more national in scope the labor market, the greater should be the impact of amenity levels on market compensation .

This study extends the regional labor market literature by examining individual wage formation using National Longitudinal Survey of Youth (NLSY) data over the 1979-1996 period. In this preliminary draft, we report findings for the 1988 cross-section. Our NLSY data set is augmented by Geocode identifiers of the respondent's county of residence, which are not reported in the public release of the NLSY. Knowledge of the respondent's county of residence allows us to construct disaggregate measures of amenities and economic conditions at the county (or MSA) level and merge this information with the *individual's* demographic and human capital measures. Thus, aggregation problems that result from using regional average measures of wages, demographics, and human capital are mitigated.

The regional disaggregation in our data also allows us to explore another key issue: whether nonmetropolitan wage formation is different from metropolitan wage formation. The importance of the issue is illustrated by the relative decline in nonmetropolitan per capita income versus metropolitan per capita income (BEA, 1998). In this regard, there is a large literature regarding the spatial mismatch of workers in central cities and jobs in the suburbs (see Holzer's 1991 survey). Yet, there is much less examination of spatial mismatch between workers in a rural locale and jobs in larger metropolitan areas or elsewhere. In particular, given the potential for lengthy commutes and an absence of public transportation in these areas, spatial mismatch may be a bigger concern in rural areas. Thus, a better understanding of the distinctiveness between metropolitan and nonmetropolitan labor markets would help guide rural and urban economic development policymaking in terms of creating high-wage or high-quality jobs.

Given the metropolitan and nonmetropolitan labor market structure, this paper also attempts to

explain an individual's decision to undertake metro/nonmetro migration. Though the 1980s, net in-migration favored the metro and nonmetro areas in close proximity to metro areas (Comartie and Nord, 1996). Beginning in the early 1990s, in-migration trends tended to favor nonmetropolitan counties. The migration decision is predicated on predicted structural wage differences and amenity uniqueness between the metropolitan and nonmetropolitan. Using a wage decomposition model, a potential metropolitan wage is estimated for migrating nonmetropolitan workers. Similarly, a potential nonmetropolitan wage is estimated for urban workers. The resulting differential between the current rural wage and the potential urban wage, along with other personal characteristics and spatial labor market and amenity characteristics, is used to estimate the probability of nonmetropolitan to metropolitan migration. A similar model is used to estimate metropolitan to nonmetropolitan migration.

The next section presents a model of individual wage formation that includes the effects of individual skill level and location-specific factors and the probit model used to predict migration patterns. Section III presents the data and empirical models, Section IV contains empirical findings for one year of the sample, and the final section discusses future directions.

II. Theoretical Model

The primary determinant of an individual's wage is ability and human capital accumulation. Yet, the presence of location-specific firm and household amenities and differences in regional economic conditions also influences wages. As Abraham and Haltiwanger (1995, p. 1261) note, "... the national labor market is probably best characterized as a web of local labor markets that are linked differentially by sector, occupation and skill type." In this manner, Roback (1982) presents a general equilibrium model that introduces location-specific firm (or productivity enhancing) amenities and household amenities in the determination of wages and land rents. Although the interaction of wages and rents complicates the analysis, it is generally thought that greater firm amenities increase wages because firms can afford to pay higher wages and remain competitive. The reverse is true for disamenities which reduce productivity. Likewise, more household amenities are generally thought to

be negatively related to wages as households are willing to trade lower wages to remain in the area, whereas they increase land rents as demand for land increases in more amenable locations.

Sjaastad (1962) and Borjas et al. (1992) show that individuals tend to migrate to areas where there are higher returns to their particular bundle of human capital characteristics. Such migration tends to arbitrage away differences in returns to human capital characteristics. However, the presence of location-specific effects can result in differing marginal products for human capital characteristics across regions (Farber and Newman, 1987). In this vein, the persistence of long-term per capita income differentials across the United States (Barro and Salai-Martin, 1991) point to the sluggishness of regional economic convergence. This suggests that returns to human capital may persistently vary across regions, but a greater propensity to migrate should reduce the size of regional wage differentials.

Disequilibrium adjustments to local economic conditions can also influence regional wage differentials. For example, wages typically rise when employment increases do not immediately result in greater labor in-migration from other regions. Consistent with this point, Partridge and Rickman (forthcoming) show that the short-term response of in-migration to employment growth can be rather small, especially if the region's employment growth is concentrated in industries that are faring well nationally.

As noted by Abraham and Haltiwanger (1995), it is unlikely that local economic conditions have a uniform influence on wages across all occupations. Clearly, some high-skilled labor markets are thought to be much more linked to national labor market conditions (e.g., Ph.D. economists). In this case, local (national) economic conditions should have less (more) impact on high-skilled wages than on low-skilled wages due to a greater propensity to migrate to the best economic opportunity.

Besides skill levels, it is also possible that metropolitan labor markets are in general more linked to national labor markets than are nonmetropolitan labor markets. This would be the case if innovations or management techniques diffuse more slowly to the rural hinterlands. Similarly, a closer linkage would result when metropolitan residents are more mobile than their nonmetropolitan

counterparts.[1] When metropolitan labor markets are more influenced by national conditions, a typical MSA's employment growth should have a smaller influence on its wages than a typical nonmetro area's employment growth on its wages. If so, traditional economic development policies of creating jobs -- any jobs -- makes more sense in rural areas.

There are also reasons to believe that amenities will be valued differently in metropolitan and nonmetropolitan labor markets. For one, individuals self-select to live in areas with their preferred amenity bundle, suggesting that metropolitan and nonmetropolitan area residents have heterogeneous tastes for amenities. For example, BEA data indicates that the nonmetro/metro per capita income ratio has fallen since the early 1970s.[2] One reason may be that nonmetropolitan amenities are increasingly valued by households, and hence workers are willing to forego income to obtain these amenities. Furthermore, during the 1990s, despite the lower relative per capita income, nonmetropolitan areas have gained population through net migration from metropolitan areas (U.S. Bureau of the Census). Nonetheless, an alternative hypothesis for relatively lower nonmetro wages is poor economic conditions and low human capital levels.

The above discussion suggests the following two models shown in equations (1a-b) for worker i's wage (w) in year t. The model in equation (1a) is for workers residing in metropolitan area *m*, while the model in equation (1b) is for workers residing in nonmetropolitan county *n*.

$$(1a)\ w^{m}_{it} = f(\mathbf{X}_{it}, \mathbf{E}_{mt}, \mathbf{A}_{mt}, \tau^{m}_{t})$$

$$(1b)\ w^{n}_{it} = f(\mathbf{X}_{it}, \mathbf{E}_{nt}, \mathbf{A}_{nt}, \tau^{n}_{t})$$

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[1]In this manner, 1990 Census of Population migration data somewhat supports the hypothesis that metropolitan labor markets are more linked to the national labor market. That is, metropolitan residents were much more likely to have been born in a different state than nonmetropolitan residents (41.2% versus 27.8%) and were more likely to have moved across state boundaries in the preceding five years (9.6% versus 8.5%). However, metropolitan and nonmetropolitan residents were about equally likely to have moved across a county line (19.0% versus 19.3%) in the preceding five years.

[2]Nonmetropolitan per capita income was about 71.2% of metropolitan per capita income in 1969, rising to about 78.2% in 1973. This ratio fell to about 70.2% in 1988, leveling out to about 71.5% in 1996.

In equations (1a) and (1b), **X** is a vector of time variant and invariant measures of the worker's human capital and demographic characteristics, **E** is a vector of the economic structure of the county or MSA where worker i resides including measures of cyclical activity; and **A** is a vector of time variant and time invariant measures of the county's level of amenities. Finally, τ is a vector of time period effects to control for factors that have a common influence across all MSAs or nonmetro areas. In particular, τ accounts for all national business cycle effects in a given year.

The basis for migration choices is that workers decide to move to a new residential location when the benefits of relocation outweigh the costs. Net benefits of migration are influenced by many factors, including the worker's desire to earn a higher income, the cost of moving (monetary and psychic), and the amenities of the new residence (as well the loss of the amenities of the old residence). Migration choice should be positively related to the anticipated wage differential, amenity level, and other factors including industry, labor market, and individual characteristics. Equation (2) represents the metro/nonmetro migration choice decision:

$$(2a)\ M_M = G((W^M - W^N), \mathbf{X}, \mathbf{E}, \mathbf{A})$$

$$(2b)\ M_N = G((W^N - W^M), \mathbf{X}, \mathbf{E}, \mathbf{A})$$

where M is a migration choice indicator variable, W^M-W^N and W^M-W^N are the predicted wage changes due to respective metro or nonmetro migration, and **X**, **E**, and **A** represent individual characteristics, local labor market characteristics, and amenity attributes, respectively.

III. Data and Empirical Model

The primary data source is the 1979-1996 NLSY augmented by Geocode identifiers of the respondent's home county. The NLSY is a longitudinal survey begun in 1979 of young males and females between the ages of 14 and 21. By the end of the sample period, the respondents were in their early to late 30s. The key advantage of considering young workers is that they are geographically more mobile than average, and hence should be more influenced by national economic conditions. Given the greater mobility of individuals in this sample compared to average, this data set should

provide a stringent test of whether these are spatial differences regarding the effects of local economic conditions and location-specific amenities.

The data are segmented into metropolitan and nonmetropolitan subsets. The segmentation is base on the Beale index for metropolitan and nonmetropolitan counties.[3] The dependent variable used in the regression analysis is the usual hourly wage taken as usual weekly earnings divided by usual weekly hours. Assuming a log-linear form for equations (1a) and (1b), the following metropolitan and nonmetropolitan equations can be written:

$$(3a)\ w^{m}_{it} = \alpha 0 + \alpha 1 \mathbf{Xit} + \alpha 2\, \mathbf{E}_{mt} + \alpha 3\, \mathbf{A}_{mt} + \alpha 4\, \tau^{m}_{t} + v_i + e^{m}_{it}$$

$$(3b)\ w^{n}_{it} = \beta 0 + \beta 1 \mathbf{Xit} + \beta 2\, \mathbf{E}_{nt} + \beta 3\, \mathbf{A}_{nt} + \beta 4\, \tau^{n}_{t} + v_i + e^{n}_{it}.$$

In equations (3a-b), $\alpha 0$ and $\beta 0$ are constants, $\boldsymbol{\alpha 1}$-$\boldsymbol{\alpha 4}$ and $\boldsymbol{\beta 1}$-$\boldsymbol{\beta 4}$ are coefficient vectors, and τ is a vector of year dummies. Since we consider only one year in this preliminary draft, both $\alpha 4\, \tau^{H}_{t}$ and $\beta 4\, \tau^{L}_{t}$ are subsumed in their respective constant terms, $\alpha 0$ and $\beta 0$. The error term is made up of two components, v and e, where v reflects unmeasured differences in ability for individual i that are assumed to be time-invariant ($Ev_i=0$, $Ev_i^2=\sigma_v^2$, $Ev_iv_j=0$ for all i and j). The e term represents the typical regression error with mean zero and a standard deviation equaling σ_e^2 ($Ee_{it}e_{jk}=0$, $Ee_{it}v_j=0$ for all i, t, and j, $i \neq j$). The wage equation model is estimated as a random effects model.

The parameter estimates from equations (3a) and (3b) are used to construct a wage decomposition that will be used to predict the wage that a nonmetropolitan worker would earn if he or she moves to the metropolitan sector and the predicted wage the metropolitan worker would receive in

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[3]The Beale index was developed by Calven Beale at the U.S. Department of Agriculture and includes 4 typologies for metropolitan counties (i.e., 0=central counties of metro areas of 1 million population or more, 1=fringe counties of metro areas of 1 million population or more, 2=counties in metro areas of 250,000 to 1 million population, 3=counties in metro areas of fewer than 250,000 population) and 6 classifications for nonmetropolitan counties (i.e., 4=urban population of 20,000 or more, adjacent to a metro area, 5=urban population of 20,000 or more, not adjacent to a metro area, 6=urban population of 2,500 to 19,999, adjacent to a metro area, 7=urban population of 2,500 to 19,999, not adjacent to a metro area, 8=completely rural or less than 2,500 urban population, adjacent to a metro area and 9=completely rural or less than 2,500 urban population, not adjacent to a metro area). Although we placed these county codes in the economic conditions vector, there could be unmeasured amenity effects that are also reflected in their coefficients.

the nonmetropolitan sector. The wage decomposition is calculated in the following manner:

$$(4a)\quad PREDWAG_M = \alpha 1 X_N + \alpha 2 E_N + \alpha 3 A_N$$

$$(4b)\quad PREDWAG_N = \beta 1 X_M + \beta 2 E_M + \beta 3 A_M$$

The predicted metro wage ($PREDWAG_M$) that a current nonmetro worker would earn in the metro labor market is determined by multiplying the nonmetro worker's productivity characteristics in vector $\mathbf{X_N}$ by the estimated metro return to those characteristics in vector $\alpha\mathbf{1}$. Similarly, the potential metro wage related to the nonmetro worker's locality economic characteristics is estimated by $\alpha 2 \mathbf{E_N}$; and the potential metro wage associated with the individual's nonmetro county amenity characteristics is estimated by $\alpha 3 \mathbf{A_N}$. Included in locality effects are measures of metro disamenities which are used to estimate the wage compensation associated with higher congestion and crime. The predicted nonmetro wage ($PREDWAG_N$) is the wage that a current metro worker would earn in the nonmetro labor market. It is estimated by multiplying the metro worker's productivity, labor market, and amenity characteristic vectors by the estimated nonmetro labor market parameter coefficients. The nonmetro predicted wage also contains measures that adjust the wage structure for the value of consuming nonmetro amenities (less pollution, congestion, crime etc.).

The individual variables in the vector **X** for the wage equation follow conventional specifications. The human capital and individual characteristics in **X** that are used to explain LNRWAG include dummy variables for the following highest completed educational degrees (high school dropout is the base): high school (HS), Associate of Arts (AA), bachelor's degree (BA), master's or PhD (ADVAN), and professional (PROF). Gender and racial categorical dummies (white male base) include: FEMALE, BLACK, ASIAN, HISPANIC, and NATIVE. Dummies are also included for collective bargaining coverage (UNION), part-time employment (PT), marriage (MAR), health problems that affect the individual's work or pay (HEA),and the respondent's Armed Forces Qualifications Test (AFQT) score, which was administered to most of the NLSY sample in 1980. Worker's tenure (TEN) and its square (TENSQ) as well as actual work experience (EXP) along with its square (EXPSQ) are also added.

Job characteristics include occupational dummy variables for professional and managerial (MANGPROF), technical (TECH), clerical (CLER), sales (SALES), craftsmen (CRAFT), operatives (OPER), natural resource occupation (NATRES), household service workers (PERSERV), professional and business service (PROSERV), and government administration (ADMIN); laborers are the omitted category.

The **E** vector includes several different measures of economic conditions in the respondent's county. Generally, for nonmetropolitan respondents, we employ county level economic measures because the county is probably a reasonable characterization of the respondent's labor market. Subsequent research will investigate whether MSA measures are more appropriate for metropolitan workers.[4] The primary economic variable is annual labor market employment growth using BEA REIS data. In particular, we are interested in the magnitude of the coefficient across the metropolitan and nonmetropolitan specifications. To investigate the role played by the economic base, we include private nonfarm employment density (PNFDEN), its square (PNFDENSQ), and manufacturing and farm employment shares of total private employment (MANSH and FARMSH). The employment shares examine whether greater shares in the relatively high (low) paying manufacturing (farm) sector spills over and lift (lower) the wages of all workers in the locale. Finally, the percentage change in private nonfarm (%ΔPNF), manufacturing (%ΔMANF), and farm employment (%ΔFARM) from one through five years, inclusively is included. A dummy to capture large employers (LARGEMP) with 1000 employees or greater is also included.

Amenities in the **A** vector are the standard variables found in the literature (e.g., Blomquist et al., 1988). These include measures of various climate, crime, and other amenities and disamenities

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[4]Obviously, county or MSA may not perfectly reflect the relevant labor market for the respondent. For example, in larger MSAs, the respondent may not be able to work in the entire MSA. Likewise, some nonmetropolitan respondents may be able to work in other counties. To the extent that our labor market measures suffer from measurement error, the resulting coefficients will be biased towards zero, which should be kept in mind when interpreting the results. Of course these same problems affect other potential market definitions including BLS Labor Market Areas and BEA market areas.

proxied by population density and its square, where the climate data is assembled from a number of sources by the U.S. Department of Commerce *Counties USA* database.[5] The sources include the National Weather Service and the FBI Uniform Crime Reports. The amenity vector also includes regional dummies for West, South, Midwest, and Northeast (omitted group) to control for other amenity effects that vary by region. Finally, we include measures of the local tax burden from the Census of Governments, again reported in *Counties USA* to proxy local fiscal conditions in the county. As with the economic variables, there are two key hypotheses that will be tested. First, do nonmetropolitan workers value favorable amenities (through lower wages) more than metropolitan workers? If so, this would help to explain the nonmetro/metro income differential and migration patterns in the 1990s? Second, do highly educated workers value amenities differently than less educated workers? Such findings have obvious policy implications as cities and rural areas attempt to attract high-skilled workers and jobs.

A probit model is estimated to measure the likelihood an individual will migrate from a nonmetro to metro residence (5a) as well as migration from a metro to nonmetro residence (5b). The reduced form specification for individual *i* is:

(5a) $P(M_M=1) = P(\Omega \mathbf{W}_M + \epsilon_i) > 0.$

(5b) $P(M_N=1) = P(\Omega \mathbf{W}_N + \epsilon_i) > 0.$

The dependent variable for equation (5a) is the worker's metro-migration status or nonmetro to metro migration during the NLS survey years 1988-93, $M_M=1$ (remain in nonmetro sector, $M_M=0$). For equation (5b), the dependent variable is the worker's non-metro migration status or metro to nonmetro migration, $M_M=1$ (remain in metro sector, $M_N=0$). Vector **W** contains variables that control for the migration decision, and ϵ_i is the error term. The **W** vector includes the wage equation structural variables in vectors **X**, **E**, **A**. Additionally, individual local labor market factors that may influence

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[5]Note that this regression does not directly control for land or housing costs, the primary reason for cost of living to vary across regions. The rationale is that wages and rents are simultaneously determined (Roback, 1982). Hence, our wage equation can be best viewed as a reduced form equation (Herzog and Schlottmann, 1993).

migration include the receipt of unemployment insurance (UNEMPINS), number of weeks unemployed (WKSUNEM), and whether a spouse is employed (SPOUSEMP). Finally, county median family income (MEDINC) and poverty level (POVLEV) are included as controls for migration.

IV. EMPIRICAL RESULTS

Table 1 presents the descriptive statistics weighted by NLSY sample weights. Column (1) contains the metropolitan descriptive statistics, column (2) contains the nonmetropolitan descriptive statistics, and column (3) contains the absolute value of the t-statistic to test whether the metro and nonmetro means are statistically different. The sample includes 20,864 metropolitan and 4,552 nonmetropolitan observations.

The average metropolitan wage is 0.24 log points greater than the average nonmetro wage, or 27.1% higher (exp[.24]=1.271). Metro areas also have a higher average share of workers with at least a 4-year college degree, while nonmetro areas have a higher share of high school graduates. Metro area occupations are more likely to be in relatively higher-skilled managerial & professional occupations and technical occupations. The more favorable metro skill distribution somewhat explains its higher wage structure. Metro areas also have higher shares of union workers, workers employed by large employers, African American workers, Hispanic workers, as well as higher taxes and a higher crime rate. Column (3) shows that most of the metropolitan and nonmetropolitan means are significantly different, which is not surprising given the large sample sizes.

Table 2 reports random-effect regressions separately estimated for the metropolitan and nonmetropolitan samples. The semi-log functional form is estimated by a maximum likelihood procedure using the SAS statistical package. Column (1) reports the metropolitan worker results and column (2) reports the nonmetropolitan results. To test whether it was appropriate to divide the sample into metro and nonmetro subsamples, a Chow test was conducted for the null hypothesis that the metro and nonmetro coefficients were equal (not shown). This null hypothesis could be rejected at the 0.1%

level of significance.[6] Likewise, in further sensitivity analysis, Chow-tests were conducted to see if the metro and nonmetro regression coefficients differed within the broad category groupings in equation (2) (e.g., do the metro and nonmetro human capital and demographic variable coefficients differ). With the exception of the local labor market variable group, the difference between the metro and nonmetro coefficients within each individual category group was statistically significant at the 5% level.[7]

Turning first to the variables in the human capital and demographic category, most of the coefficient signs are as expected. For example, there is a concave wage-actual experience and a concave wage-tenure relationship. What is most interesting is that there are consistently higher returns to educational attainment in nonmetro areas. On one hand, this could reflect a greater demand for skill in nonmetro areas. However, given the emphasis in urban economics on agglomeration effects and dynamic externalities (e.g., Glaeser et al., 1992; Henderson, 1997), it seems implausible that nonmetro areas would have the excess demand for educational attainment. On the other hand, greater nonmetro education returns are most consistent with a smaller relative supply of educated workers. For public policymaking, this suggests that there are gains to increasing the supply of college educated labor in nonmetro areas. However, one possible reason for the relatively lower supplies of college educated workers in nonmetro areas is that they lack amenities associated with urban scale, which are desired by more educated workers.

Most of the occupational coefficients are approximately equal between both models, although there are some key differences. For example, the greater nonmetro manager/professional coefficient supports the notion that there are greater nonmetro returns to certain types of skill. Other metro/nonmetro labor market differences are reflected by greater nonmetro wage differentials for

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[6]The Chow test was conducted by interacting a nonmetro indicator variable with each variable in the regression in Table 2 and then including these interactions in a regression of the pooled metro-nonmetro sample. The Chow test considers the joint significance of all of the nonmetro interaction variables. The resulting likelihood ratio test statistic equalled 250.7 with 63 degrees of freedom.

[7]Additional sensitivity analysis was conducted by dropping the industry dummy variables from the base models and omitting the occupation dummy variables from the base models (not shown). In both cases, the remaining coefficients were basically unchanged, suggesting that the empirical results are quite robust to even significant specification changes.

workers in sales, service, and operator occupations, again suggesting spatial differences between the two types of labor markets. However, caution should be exercised in interpreting the occupation coefficients because they are measured relative to laborer wages.

Not surprisingly, employees at large employers earn higher wages. Thus, as shown in Table 1, the 11 percentage point greater share of metro workers employed at large employers is one reason for higher average metropolitan wages. However, nonmetro workers earn even greater returns when working for large employers, suggesting that nonmetro workers employed at small firms are especially penalized. Part-time workers are penalized about 5% more in nonmetro areas than in metro areas, which may reflect spatial differences in their secondary labor markets. Interestingly, the race coefficients are quite similar between the two models. This goes against the idea that rural employers are more bigoted, or that the lack of labor market competition allows nonmetro employers to practice discriminatory tastes. However, nonmetro females earn about 2% less than observationally equivalent metro females, which is consistent with nonmetro females being more likely to be employed in the secondary labor market (and may also reflect discrimination).

As expected, workers in the Midwest, South, and West earn lower wages than observationally equivalent workers in the Northeast. At least for metropolitan residents, the lower Southern and Western wage differentials are consistent with superior household amenities (and cost of living). However, since these coefficients reflect offsetting firm and household amenity effects, the regional coefficients should be cautiously interpreted. For example, the relatively low Midwest wage differential in the nonmetro model suggests that the Midwest has superior household amenities, going against conventional wisdom.

The **Local Labor Market Variables** also suggest some key differences between the two types of labor markets. Foremost, a persistent one percentage point greater private nonfarm employment growth increases wages by about 0.25% for nonmetro workers, but by only 0.02% in nonmetro areas.[8]

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[8]Borjas et. al (1992) found that a 1 percentage point faster *state* employment growth rate over a six-year period increased wages about 0.2% using NLSY data. This is comparable to the weighted metro/nonmetro

This evidence does not support the hypothesis that wages in spatially isolated nonmetro labor markets are more influenced by local economic conditions. Instead, this suggests that labor supply in nonmetro counties are fairly responsive to economic conditions, although whether this response is through greater participation, in-migration, or by outside commuters is unknown. In both models, only the three-year lagged employment growth coefficient is statistically significant. This pattern suggests that wages are relatively sluggish in adjusting to local labor market conditions, although multicollinearity may be one reason for the insignificance of the more recent years. Yet, the sluggish labor market adjustment process is consistent with Bartik (1993).

Farm employment growth is only positively related to metro wage growth at the third lag, while farm employment growth is negatively associated with nonmetro wages at all lags. Summing the farm employment growth coefficients suggests that a persistent one percentage point greater farm employment growth rate will increase metro wages by 0.04% and reduce nonmetro wages by 0.53% over a four year period. Given that farming is thought to be an important base industry in many nonmetropolitan counties, the rather surprising negative farm employment growth-wage association could be due to a negative composition effect from increasing the size of the relatively low-paying farm sector. Nonetheless, it does suggest that reoccurring farm-crises do not necessarily depress wages in nonmetro areas, whose economic health are thought to be more dependent on the farm economy. Regarding the dynamics, only the three-year lag of farm employment growth is statistically significant in the metro specification, while both the second- and third-year lags are significant in the nonmetro model. Again, this suggests a rather sluggish wage adjustment to local labor market conditions.

Neither the manufacturing share of private employment or the farm share of private employment are statistically significant, suggesting few wage spillover effects due to industry composition. In particular, this suggests that local economic development efforts to attract manufacturing may have few positive impacts outside of the workers directly employed. Given the importance placed on manufacturing in economic development efforts, this suggests that such a strategy

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average in this study.

may not be worthwhile. For both models, the local unemployment rate was insignificant, suggesting that neither wage curve effects nor Harris-Todaro compensating differential effects dominate.

The **Amenity and Fiscal Variables** also indicate some key metro/nonmetro differences. First local taxes are positively associated with metro wages suggesting that even accounting for the services that local taxes fund, local taxes are still a disamenity that are compensated through higher wages. This was especially the case for property taxes, which is somewhat surprising given its importance in funding local schools (which should have some positive benefits). For the nonmetro specification, neither tax variable was significant, which may reflect a lower importance placed on local taxes by nonmetro residents. For example, as shown in Table 1, taxes are generally quite low outside of metropolitan areas, which suggest that taxes may not be at the threshold to dramatically affect household behavior. Alternatively, it may be easier for nonmetro residents to identify the positive benefits (or amenities) from the services that are funded by their taxes (e.g., note the positive nonmetro property tax coefficient).

Per capita crimes are positively related to metro and nonmetro wages, suggesting that crime's household disamenity effects outweighs the negative effects that greater crime has on firm productivity (e.g., a need for costly protective and preventative measures). Moreover, it is noteworthy that despite average nonmetro crime rates being one-half of the average metro level, crime appears to be a much bigger disamenity in nonmetro areas as reflected by the six-fold larger crime coefficient.

The climate variables are all statistically significant in the metro specification. The coefficients suggest that metro workers prefer climates that are neither too hot nor too cold. Surprisingly, the positive percent of available sunshine coefficient suggests that metro residents view sunshine as a disamenity. In the nonmetro specification, climate appears to be less important in wage determination. Even at the 10% level, only heating degree days were statistically significant. One possible explanation for these results is that at the margin, relatively footloose metro residents arbitrage utility differentials due to favorable climate. This supports the hypothesis that wages in more closely linked metro labor markets are more sensitive to the effects of locational amenities.

The **Industry Where Employed** results indicate that agriculture and retail are the lowest paying metropolitan industries, while retail and personal services are lowest paying nonmetro industries. At the other end, mining and transportation and public utilities are the highest paying sectors in both specifications. Overall, the industry coefficients suggest that the relative industry rankings are quite similar between the two specifications. Yet, most of the industry coefficients differ between the two models by at least 0.03 points (or 3%), although caution needs to be exercised since the coefficients are measured relative to manufacturing. Nonetheless, farm workers fare relatively better in nonmetro areas, while personal service workers fare relatively better in metro areas.

The probit results in Table 3 show that the predicted wage change (CHWAGE) from migration has a significant effect on the probability of metro to nonmetro migration, but no significant effect on nonmetro to metro migration. This suggests that metro workers' decision to move to a nonmetro region is negatively effected by the lower expected wage in the nonmetro labor market. The nonmetro result suggests that factors other than expected wage change drive nonmetro to metro migration. Nonmetro workers expect higher wages in a metro area, thust local amenities and local labor market conditions are the primary determinants of nonmetro to metro migration. One amenity that play a significant role in migration is the crime rate. The nonmetro crime rate is a strong deterrent of nonmetro to metro migration (negative and highly significant coefficient); while the metro crime rate is a strong motivator of metro to nonmetro migration (positive and highly significant coefficient). Similarly, disamenities from metro congestion, as implied by the positive and significant coefficient for population density are a strong influence on metro to nonmetro migration. Population density has no significant impact on the nonmetro to metro migration decision. Degree heat days and cooling degree days negatively affects metro to nonmetro migration. This reflects the negative wage effects which suggest that heat days and cool days are amenities. Finally, the other tax share has a positive effect on nonmetro to metro migration but a negative effect on metro to nonmetro migration. Apparently, metro workers perceive greater public sector benefits than nonmetro workers from their taxes. Since nonmetro wages are lower than metro wages, nonmetro workers may have a greater sensitivity to tax

levels.

Local labor market conditions should have a strong influence on metro to nonmetro migration. Lagged %ΔPNF is a deterrent to nonmetro to metro migration. Clearly, workers stay in nonmetro areas if local job growth is high, and they migrate in to metro areas private nonfarm growth is limited–especially the young cohorts in the NLSY. Metro to nonmetro migration probability, interestingly, is positively impacted by private nonfarm job growth. This may also reflect increasing disamenities to congestion from population growth associated with job growth. A high percentage of metro farm employment share also has a positive influence on migration to the nonmetro sector.

Individual and employment factors having positive effects on nonmetro to metro migration include workers with tenure, married workers, blacks, union workers, and retail workers. A worker with significant tenure and established job stability is most likely recruited by high paying metro employers. Similarly, union workers tend to have higher human capital skills. Individual and employer characteristics with a negative effect on nonmetro to metro migration include Similarly, union workers tend to have higher human capital skills. Individual and employer characteristics with a negative effect on nonmetro to metro migration include Asian, Hispanic, and Native workers, workers at large firms, and workers in professional, technological, sales, service, and operator occupations. Some minorities may have a high demand for rural amenities and consequently are less likely to migrate. For example, Natives may prefer to live on reservations to be closer to Native culture and family. Workers at large firms receive a wage premium which discourages migration. The negative effect of managerial and professional occupations on metro to nonmetro migration is somewhat surprising since these workers typically have the greatest human capital assets and would in theory be best suited in the metro labor force. Managerial and professional workers, however, receive a large relative wage differential in the nonmetro sector.

Characteristics having a positive effect on the probability of metro to nonmetro migration include tenured workers, workers with an associate's of arts degree, union workers, part-time workers, managerial/professional, and sales occupations. Workers with long tenure and a high degree of

reliability are highly desired by nonmetro employers as well. Workers with an associates degree receives a wage premium in the nonmetro labor market and likely encourages their migration to nonmetro areas. Part-time workers likely are having a difficult time finding work in a metro area or are the spouse of a primary, full-time worker who tends to move as their spouse is relocated. Professional degrees (PROF), doctors, lawyers, etc., clearly have a negative effect on the probability of metro to nonmetro migration. Apparently the foregone earnings (and perhaps amenities) in the metro sector greatly exceeds the value of rural/nonmetro amenities.

Finally, the workers living in the West and South regions have the highest probabilities of nonmetro migration. The Midwest, West, and South regions, relative to the Northeast control group, demonstrate a high probability of nonmetro to metro migration.

IV. Future Directions

The primary aim of this study is to explore the linkage of national and local labor markets by examining how human capital, local labor market activity, and locational amenities interact in a wage model and migration decisions. By focusing on wages, this study differs from much of the previous literature which emphasized the role of aggregate employment growth and migration patterns. In particular, once completed, this study will extend the previous literature in two key directions. First, it will explore whether local economic activity and location-specific amenities have different effects on metropolitan and nonmetropolitan area wages and migration. Second, it will determine whether these effects on workers varied by education and skill level between metro and nonmetro workers. Although only preliminary empirical estimates have been generated, we believe that the results are promising. There is evidence of differences between metropolitan and nonmetropolitan labor markets in their responses to employment opportunities and location specific factors.

References

Abraham, Katharine G. and John C. Haltiwanger. "Real Wages and the Business Cycle." *Journal of Economic Literature*. September 1995 (33), 1215-1264.

Barro, Robert J. and Xavier Sala-i-Martin. Convergence Across States and Regions." *Brookings Papers on Economic Activity*. #1, 1991, 107-158.

Bartik, Timothy J. "Who Benefits from Local Job Growth: Migrants or the Original Residents?" *Regional Studies*. 4, 1993 (27), pp. 297-311.

Blanchflower, David G. and Andrew J. Oswald. *The Wage Curve*. Cambridge, MA: MIT Press, 1994.

Blomquist, Glenn C., Mark C. Berger, and John P. Hoehn. "New Estimates of Quality of Life in Urban Areas." *American Economic Review*. March 1988 (78), 89-107.

Borjas, George J., Stephen G. Bronars, and Stephen J. Trejo. "Self-Selection and Internal Migration in the United States." *Journal of Urban Economics*. September 1992 (32), 159-185.

Bureau of Economic Analysis, www.bea.gov. Tables CA1-3, 1998.

Carlino, Gerald A. and Edwin S. Mills. "The Determinants of County Growth." *Journal of Regional Science*. February 1987 (27), 39-54.

Center for Human Resource Research. *NLSY79 Users' Guide, 1997*. Columbus Ohio: The Ohio State University, 1997.

Clark, David E. and Christopher A. Murphy. "Countywide Employment and Population Growth: An Analysis of the 1980's." *Journal of Regional Science*, 1996, 36(2), 235-256.

Clark, David E. and William J. Hunter. "The Impact of Economic Opportunity, Amenities and Fiscal Factors on Age-Specific Migration Rates." *Journal of Regional Science*. August 1992 (32), 349-365.

Comartie, John B. and Mark Nord, "Migration and Economic Restructuring in Nonmetro America, 1989-94," *Working Paper*, Economic Research Service, U.S. Department of Agriculture, September, 1996.

Farber, Stephen C. and Robert J. Newman. "Accounting for South/Non-South Real Wage Differentials and for Changes in Those Differentials Over Time." *Review of Economics and Statistics*. May 1987 (69), 215-223.

Fox, William F., Henry W. Herzog, and Alan M. Schlottman. "Metropolitan Fiscal Structure and Migration." *Journal of Regional Science*. November 1989 (29), 523-536.

Gale, H. Frederick. "Labor Productivity and Wages in Rural and Urban Manufacturing Plants." *Review of Regional Studies*. Summer 1998 (28), 13-26.

Glaeser, Edward L., Hedi Kallal, Jose Sheinkman, and Andre Schleifer. "Growth in Cities." *Journal of Political Economy*. December 1992 (100), 1126-1152.

Graves, Philip E. and Peter Linneman. "Household Migration: Theoretical and Empirical Results." *Journal of Urban Economics,* 1979, 6, 383-404.

Greene, William H. *Econometric Analysis*. Upper Saddle River, NJ: Prentice Hall, 1997.

Greenwood, Michael J. and Gary L. Hunt. "Jobs versus Amenities in the Analysis of Metropolitan Migration." *Journal of Urban Economics*. January 1989 (25), 1-16.

Greenwood, Michael J., Gary L. Hunt, Dan S. Rickman, and George I. Treyz. "Migration, Regional Equilibrium and the Estimation of Compensating Differentials" 1991, *American Economic Review,* 81, 1374-1381.

Herzog, Henry W. and Alan M. Schlottmann. "Valuing Amenities and Disamenities of Urban Scale: Can Bigger Be Better?" *Journal of Regional Science*. May 1993 (33), 145-165.

Harris, John R. and Michael P. Todaro. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review*. March 1970 (60), pp. 126-142.

Henderson, Vernon. "Externalities and Industrial Development." *Journal of Urban Economics*. November 1997 (42), 449-470.

Herzog, Henry W. and Alan M. Schlottmann. "Valuing Amenities and Disamenities of Urban Scale: Can Bigger Be Better?" *Journal of Regional Science*. May 1993 (33), 145-165.

Holzer, Harry. "The Spatial Mismatch Hypothesis: What has the Evidence Shown?" *Urban Studies*. February 1991 (28), 105-122.

Knapp, Thomas A. and Phillip E. Graves. "On the Role of Amenities in Models of Migration and Regional Development." *Journal of Regional Science*. February 1989 (29), 71-87.

Muth, Richard F. "Migration: Chicken or Egg?" *Southern Economic Journal*. January 1971 (37), 295-306.

Nakosteen, R., and M. Zimmer, "Migration and Income: The Question of Self-Selection," *Southern Economic Journal*, 1980 (46), pp. 840-851.

Partridge, Mark D. and Dan S. Rickman. "A Note on the Benefits to Current Residents to State Employment Growth: Is There an Industry Mix Effect on Migration?" *Journal of Regional Science*. forthcoming.

_____. "Static and Dynamic Externalities, Industry Composition, and State Labor Productivity: A Panel Study of States." *Southern Economic Journal*. October 1999 (66), pp. 319-335.

Polochek, Solomon, and Francis Horvath, "A Life Cycle Approach to Migration," *Research in Labor Economics*, 1977 (1), pp. 103-149.

Roback, Jennifer. "Wages, Rents, and Quality of Life." *Journal of Political Economy*. December 1982 (90), 1257-1278.

Sjaastad, Larry A. "The Costs and Returns of Human Migration." *Journal of Political Economy*, 1962 70, 80-93.

Treyz, George I. "Causes of Changes in Wage Variation Among States." *Journal of Urban Economics*. January 1991 (29), 50-62.

U.S. Bureau of the Census. www.census.gov/population/socdemo/migration/tab-a-3.txt, 1998.

U.S. Department of Commerce. *Counties USA, 1996*. CD ROM.

U.S. Department of Commerce. *REIS, 1969-1996*. CD-ROM, 1998.

Table 1
Metropolitan and Nonmetropolitan Descriptive Statistics[a]

Variable	(1) Metro Means (Std Dev)	(2) Nonmetro Means (Std Dev)	(3) Metro-NM Diff (t-stat)[b]
Log Hrly Wage	2.32 (0.48)	2.08 (0.47)	31.88
Human Capital & Demographic Variables			
AFQT Score	51.7 (27.8)	44.8 (28.2)	15.03
$Exper_{actual}$	9.6 (3.1)	9.4 (3.3)	3.34
Tenure	4.1 (3.7)	4.2 (4.0)	2.02
HS-Degree	0.56 (0.49)	0.63 (0.50)	7.44
2YR Degree	0.08 (0.27)	0.08 (0.28)	0.55
4YR Degree	0.22 (0.41)	0.15 (0.37)	10.00
ADV-Degree	0.04 (0.20)	0.02 (0.13)	10.78
Prof-Degree	0.007 (0.09)	0.004 (0.06)	3.54
Manag-Prof Occ	0.26 (0.43)	0.18 (0.40)	10.78
Technical Occ	0.06 (0.23)	0.04 (0.20)	5.95
Sales Occ	0.09 (0.29)	0.08 (0.27)	4.10
Clerical Occ	0.19 (0.39)	0.14 (0.35)	9.13
Service Occ	0.10 (0.30)	0.11 (0.33)	2.84
Nat Resource Occ	0.02 (0.12)	0.04 (0.20)	7.61
Craft Occ	0.11 (0.31)	0.15 (0.36)	5.68
Operator Occ	0.11 (0.31)	0.18 (0.40)	12.06
Married	0.56 (0.49)	0.65 (0.49)	11.79
Union	0.20 (0.39)	0.15 (0.37)	6.93
Large Employer	0.46 (0.49)	0.35 (0.49)	13.01
Health Condition	0.04 (0.19)	0.04 (0.20)	0.09
Part-Time	0.11 (0.30)	0.10 (0.31)	1.77
Female	0.46 (0.49)	0.43 (0.51)	3.18
Black	0.14 (0.34)	0.10 (0.30)	8.39
Asian	0.01 (0.10)	0.01 (0.10)	0.97
Hispanic	0.06 (0.23)	0.02 (0.15)	13.28
Native Amer.	0.03 (0.17)	0.08 (0.28)	10.87
County Type & Regional Dummy Variables			
Metro > 1 million	0.60 (0.49)		na

Variable	(4) Metro Means (Std Dev)	(5) Nonmetro Means (Std Dev)	(6) Metro-NM Diff (t-stat)[b]
County Type & Regional Dummy Variables-continued			
250k > Metro < 1 mill.	0.29 (0.45)		na
Metro < 250k	0.12 (0.32)		na
Nonmet Urban adj Met		0.46 (0.52)	na
Nonmet Nonadj Urban		0.41 (0.51)	na
Nonmet Rural adj Met		0.07 (0.26)	na
Nonmet Nonadj Rural		0.06 (0.23)	na
Midwest	0.29 (0.45)	0.30 (0.47)	1.38
South	0.32 (0.46)	0.51 (0.52)	22.95
West	0.17 (0.37)	0.12 (0.34)	9.40
Local Labor Market Variables			
Farm Share of Priv Emp	0.02 (0.03)	0.08 (0.09)	51.68
Manu Share of Priv Emp	0.16 (0.08)	0.22 (0.13)	25.30
%ΔPrivate Emp	0.017 (0.03)	0.019 (0.04)	4.00
%ΔFarm Emp	-0.023 (0.05)	-0.017 (0.04)	9.11
$\%\Delta Private\ Emp_{-1}$	0.019 (0.03)	0.018 (0.04)	0.36
$\%\Delta Farm\ Emp_{-1}$	-0.023 (0.06)	-0.017 (0.04)	9.10
$\%\Delta Private\ Emp_{-2}$	0.022 (0.03)	0.018 (0.04)	6.44
$\%\Delta Farm\ Emp_{-2}$	-0.022 (0.06)	-0.023 (0.05)	1.13
$\%\Delta Private\ Emp_{-3}$	0.029 (0.03)	0.021 (0.04)	12.33
$\%\Delta Farm\ Emp_{-3}$	-0.027 (0.06)	-0.029 (0.05)	2.40
Unemployment Rate	6.0 (2.2)	8.0 (3.6)	37.1
Amenity and Fiscal Variables			
Local Prop tax per capita (in $1,000)	0.514 (0.23)	0.348 (0.23)	43.52
Local other taxes per capita (in $1,000)	0.179 (0.22)	0.079 (0.08)	52.32
Temp Deviation[c]	19.6 (2.7)	20.9 (2.3)	34.15
Heating Degree Days	4579.6 (2089.1)	5222.5 (2306.7)	17.32
Cooling Degree Days	1266.7 (873.5)	1103.2 (762.9)	12.75
%Available Sunshine	59.0 (8.1)	56.6 (9.4)	15.90
Serious Crimes per capita	0.062 (0.02)	0.033 (0.02)	83.90

Table 1-Continued

Variable	(1) Metro Means (Std Dev)	(2) Nonmetro Means (Std Dev)	(3) Metro-NM Diff (t-stat)[b]	Variable	(4) Metro Means (Std Dev)	(5) Nonmetro Means (Std Dev)	(6) Metro-NM Diff (t-stat)[b]
Industry Where Employed				**Industry Where Employed-Continued**			
Agriculture	0.01 (0.11)	0.05 (0.22)	10.21	Finance, Ins, Real Estate	0.07 (0.25)	0.04 (0.21)	7.19
Mining	0.004 (0.06)	0.02 (0.16)	8.40	Prof Bus Serv	0.28 (0.45)	0.23 (0.43)	7.50
Trans & Pub Utility	0.08 (0.27)	0.05 (0.22)	7.45	Personal Serv	0.03 (0.18)	0.03 (0.16)	3.14
Wholesale	0.04 (0.19)	0.03 (0.19)	1.03	Public Admin	0.06 (0.23)	0.04 (0.21)	4.43
Retail	0.13 (0.33)	0.14 (0.36)	2.81				
Probit Control Variables				**Probit Control Variables-Continued**			
Pedicted Wage Change	0.097 (0.37)	-0.056 (0.34)	27.01	Unemployment Insurance (weeks received)	0.169 (1.71)	0.186 (1.59)	13.46
Weeks Unemployed	0.341 (2.70)	0.409 (3.01)	1.412	Family Poverty Status	0.056 (0.23)	0.083 (0.28)	6.07
Hours Spouse Emloyed	10.4 (18.7)	12.2 (19.6)	5.66				
Probit Dependent Variable				**Probit Dependent Variable-Continued**			
Nonetro Move (from metro sector)	0.012 (0.11)			Metro Move (from nonmetro sector)		0.025 (0.16)	5.22

a. To be representative of the national population, the metro and nonmetro descriptive statistics are weighted by the NLSY sample weights rescaled such that the weights sum to the combined sample size. The metro sample size N=20,864 and the nonmetro sample size N=4,552.

b. The absolute value of the t-statistic for the difference between the metro and nonmetro sample means.

c. Temperature deviation is the difference between annual average high temperature and the average annual low temperature.

Table 2

Metropolitan and Nonmetropolitan Effect Random Effects Regression

Variable	(1) Metro (t-stats)	(2) Nonmetro (t-stats)
Intercept	1.72	1.53
	(25.32)	(10.02)
Human Capital & Demographic Variables		
AFQT Score	0.004	0.004
	(18.44)	(8.68)
$Exper_{actual}$	0.038	0.033
	(9.33)	(4.20)
$Exper^2_{actual}$	-3.8E-4	-4.9E-4
	(1.87)	(1.24)
Tenure	0.037	0.028
	(18.36)	(7.10)
$Tenure^2$	-0.002	-0.002
	(11.58)	(4.71)
HS-Degree	-0.028	0.003
	(2.23)	(0.14)
2YR Degree	0.086	0.165
	(5.05)	(4.66)
4YR Degree	0.154	0.185
	(10.04)	(5.44)
ADV-Degree	0.154	0.230
	(7.15)	(4.15)
Prof-Degree	0.289	0.547
	(5.50)	(3.94)
Manag-Prof Occ	0.053	0.094
	(5.70)	(4.90)
Technical Occ	0.070	0.072
	(5.87)	(2.58)
Sales Occ	0.009	0.089
	(0.88)	(4.04)
Clerical Occ	0.004	0.015
	(0.39)	(0.78)
Service Occ	-0.015	0.032
	(1.62)	(1.81)
Nat Resource Occ	-0.008	-0.033
	(0.41)	(1.21)
Craft Occ	0.015	0.042
	(1.60)	(2.47)
Operator Occ	-0.006	0.031
	(0.67)	(1.93)
Married	0.034	0.031
	(5.74)	(2.44)
Union	0.072	0.075
	(11.04)	(5.53)
Large Employer	0.034	0.053
	(6.85)	(5.13)
Health Condition	-0.017	0.003
	(1.53)	(0.15)
Part-Time	-0.001	-0.054
	(0.12)	(3.64)
Female	-0.126	-0.149
	(12.63)	(7.48)
Black	-0.031	-0.024
	(2.31)	(0.81)
Asian	0.078	-0.021
	(1.50)	(0.19)
Hispanic	0.004	0.006
	(0.27)	(0.16)
Native Amer.	0.009	0.040
	(0.28)	(0.16)
County Type & Regional Dummy Variables		

Table 2-Continued

	(1) Metro (t-stats)	(2) Nonmetro (t-stats)
Midwest	-0.066	-0.067
	(4.34)	(1.57)
South	-0.108	-0.063
	(5.55)	(1.42)
West	-0.108	-0.040
	(4.58)	(0.71)
Local Labor Market Variables		
Farm Share of Priv Emp	-0.079	0.117
	(0.58)	(0.98)
Manu Share of Priv Emp	-0.025	0.045
	(0.43)	(0.58)
%ΔPrivate Emp	0.084	-0.190
	(0.87)	(1.54)
%ΔFarm Emp	-0.009	-0.106
	(0.25)	(0.95)
%ΔPrivate Emp_{-1}	-0.002	0.035
	(0.03)	(0.33)
%ΔFarm Emp_{-1}	-0.038	-0.010
	(1.20)	(0.10)
%ΔPrivate Emp_{-2}	-0.028	-0.088
	(0.32)	(0.85)
%ΔFarm Emp_{-2}	-0.011	-0.194
	(0.38)	(2.12)
%ΔPrivate Emp_{-3}	0.199	0.258
	(2.34)	(2.81)
%ΔFarm Emp_{-3}	0.099	-0.219
	(3.13)	(2.58)
Unemployment Rate	-3.2E-4	6.4E-4
	(0.20)	(0.31)
Amenity and Fiscal Variables		
Local Property Taxes Per Capita (in $1,000)	0.105	0.055
	(4.67)	(1.36)
Local Other Taxes per capita (in $1,000)	0.046	-0.117
	(2.82)	(1.01)
Temp Deviation	-0.008	0.004
	(3.60)	(0.72)
Heating Degree Days	-2.9E-5	-1.9E-5
	(4.48)	(1.65)
Cooling Degree Days	-6.9E-5	-4.6E-5
	(6.17)	(1.61)
%Available Sunshine	0.004	-0.002
	(4.21)	(0.81)
Serious Crimes Per Capita	0.405	2.551
	(2.10)	(5.89)
Industry Where Employed		
Agriculture	-0.150	-0.061
	(6.43)	(1.98)
Mining	0.055	0.091
	(1.48)	(2.32)
Trans & Pub Utility	0.048	0.012
	(4.48)	(0.48)
Wholesale	-0.045	-0.051
	(3.79)	(2.02)
Retail	-0.149	-0.180
	(17.01)	(10.41)
Finance, Ins & Real Estate	-0.029	-0.019
	(2.45)	(0.58)
Prof Bus Serv	-0.064	-0.065
	(8.49)	(3.88)
Personal Serv	-0.126	-0.211
	(8.78)	(7.50)
Public Admin	0.021	-0.019
	(1.80)	(0.68)
Year Fixed Effects	y	y
-2Log Likelihood Ratio	7389.4	1428.1
N	20864	4552

Table 3

Metropolitan and Nonmetropolitan Probit Estimates

Variable	(1) Metro (z-stat)	(2) Nonmetro (z-stat)
Intercept	2.66	1.50
	(10.22)	(1.65)
Human Capital & Demographic Variables		
AFQT Score	-0.003	-0.001
	(1.44)	(0.56)
$Exper_{actual}$	0.027	0.008
	(0.93)	(0.03)
$Exper^2_{actual}$	2.6E-4	0.001
	(0.17)	(0.45)
Tenure	0.106	0.104
	(8.36)	(2.56)
$Tenure^2$	-0.004	-0.002
	(1.65)	(0.77)
HS-Degree	0.112	-0.080
	(1.43)	(0.67)
2YR Degree	0.326	0.090
	(2.35)	(0.88)
4YR Degree	-0.008	-0.019
	(0.24)	(0.05)
ADV-Degree	-0.046	-0.478
	(0.55)	(1.64)
Prof-Degree	-0.443	-0.547
	(1.63)	(0.92)
Manag-Prof Occ	0.138	-0.431
	(0.71)	(1.98)
Technical Occ	0.051	-0.654
	(0.57)	(2.74)
Sales Occ	0.009	-0.481
	(0.88)	(1.95)
Clerical Occ	0.054	-0.227
	(0.38)	(1.15)
Service Occ	-0.021	-0.383
	(0.65)	(1.77)
Nat Resource Occ	0.012	-0.045
	(0.12)	(0.02)
Craft Occ	0.176	-0.347
	(0.14)	(1.67)
Operator Occ	0.185	0.088
	(1.52)	(0.35)
Married	0.068	0.279
	(1.21)	(2.28)
Union	0.249	0.623
	(2.67)	(2.54)
Large Employer	-0.102	-0.224
	(1.66)	(2.17)
Health Condition	-0.036	-0.132
	(0.58)	(0.87)
Part-Time	0.336	0.096
	(2.62)	(0.86)
Female	0.034	-0.094
	(0.81)	(0.89)
Black	0.137	0.043
	(1.64)	(0.11)
Asian	-0.051	-0.785
	(0.33)	(2.72)
Hispanic	0.295	-0.451
	(2.65)	(2.74)
Native Amer.	-0.529	-0.394
	(3.48)	(2.22)
County Type & Regional Dummy Variables		
Population Density	0.100	1.080
	(1.65)	(0.34)
Population Density Squared	-0.003	-18.91
	(0.85)	(1.42)

Table 3-Continued

	(1) Metro (z-stats)	(2) Nonmetro (z-stats)
Midwest	-0.532	0.274
	(0.43)	(1.23)
South	-0.330	0.467
	(2.11)	(1.97)
West	-0.529	0.403
	(2.66)	(1.26)
Local Labor Market Variables		
Farm Share of Priv Emp	1.939	-0.338
	(1.70)	(0.92)
Manu Share of Priv Emp	0.579	0.268
	(1.23)	(0.98)
%ΔPrivate Emp	2.441	-2.385
	(1.65)	(1.63)
%ΔFarm Emp	0.333	-0.338
	(0.96)	(0.94)
%ΔPrivate Emp_{-1}	-1.130	-1.161
	(0.54)	(1.05)
%ΔFarm Emp_{-1}	-0.473	-1.478
	(0.82)	(1.12)
%ΔPrivate Emp_{-2}	2.226	-2.877
	(1.50)	(1.99)
%ΔFarm Emp_{-2}	-0.108	0.641
	(0.45)	(0.81)
%ΔPrivate Emp_{-3}	0.157	0.578
	(0.12)	(0.79)
%ΔFarm Emp_{-3}	-1.717	-3.059
	(3.45)	(2.54)
Unemployment Rate	0.025	0.011
	(1.51)	(1.09)
Amenity and Fiscal Variables		
Local Property Taxes Per Capita (in $1,000)	0.114	0.470
	(0.89)	(1.44)
Local Other Taxes per capita (in $1,000)	-0.266	3.306
	(2.44)	(2.60)
Temp Deviation	-0.015	-0.004
	(0.63)	(0.26)
Heating Degree Days	-1.9E-4	5.2E-5
	(4.25)	(1.13)
Cooling Degree Days	-3.6E-4	2.0E-4
	(4.66)	(1.45)
% Available Sunshine	0.006	-0.009
	(0.56)	(0.96)
Serious Crimes Per Capita	7.786	-8.76
	(4.77)	(3.16)
Industry Where Employed		
Agriculture	-0.108	0.179
	(0.73)	(0.87)
Mining	-0.476	0.555
	(1.48)	(1.31)
Trans & Pub Utility	-0.190	-0.115
	(1.70)	(0.82)
Wholesale	0.197	0.440
	(1.23)	(1.24)
Retail	0.111	0.389
	(1.20)	(1.97)
Finance, Ins & Real Estate	0.187	-0.206
	(1.46)	(1.00)
Prof Bus Serv	0.100	0.209
	(1.44)	(1.49)
Personal Serv	0.250	0.407
	(1.51)	(1.27)
Migration Control Variables		
Predicted Wage Change	-0.137	0.109
	(1.80)	(0.95)
Family Poverty Status	-0.032	0.009
	(0.32)	(0.03)
Weeks Unemployed	0.114	-0.001
	(0.85)	(0.02)
Unemployment Insurance	4.197	-0.023
	(0.01)	(0.97)

Table 3-Continued

Spouse Employment	-0.001	0.002
	(0.32)	(0.82)
Year Fixed Effects	y	y
-2Log Likelihood Ratio	1028.1	408.5
N	20864	4552