Employment Growth and the Allocation of New Jobs: Evidence from the South*

Mitch Renkow
Professor
Department of Agricultural and Resource Economics
Box 8109
North Carolina State University
Raleigh, North Carolina 27695-8109

Tel: (919) 515-5179
Fax: (919) 515-6268
mitch_renkow@ncsu.edu

A county-level labor market model is estimated for the thirteen Southern states. The model accounts for inter-county commuting, migration, and within-county adjustments to labor demand shocks. Econometric results indicate that most employment growth (60-70%) during the 1990s was accommodated by changes in commuting flows. The results also suggest that labor force growth – and, by extension, population growth and associated fiscal impacts – in rural counties is sensitive to employment growth in nearby counties. These results highlight two opposing forces related to spatial spillovers that are usually neglected in analyses of the economic and fiscal impacts of rural employment growth.

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Local economic development policies are typically oriented toward stimulating employment growth. The measuring stick most commonly used for gauging the success of a particular municipal or county development effort – as well as the individuals charged with formulating and implementing it – is the number of new jobs it creates. Widespread appreciation for spillovers from direct employment shocks via local production and consumption linkages reinforces the competition among jurisdictions of all sizes for attracting new firms and industries.

The emphasis on job creation is particularly strong in rural communities. Especially where significant declines have occurred in historically important rural industries (such as agriculture and textiles), industrial recruitment is almost universally viewed as a central element in revitalizing the local economy. In large measure, this is the result of a perception that new firms are required to compensate for job losses in traditional industries. Public finance considerations are also important. Declines in the local tax base that occur when a major plant closing occurs can be devastating, particularly in an era in which a greater share of the overall burden of providing infrastructure and other public goods has devolved to local governments. Recruiting new businesses to replace old ones facilitates provision of the same level of publicly financed services without significant changes in property tax rates.

But when employment growth occurs within a county or some other administrative jurisdiction who actually gets the new jobs? Are they taken primarily by local residents, the putative target group for locally sponsored economic development initiatives? Or do sizable fractions of the jobs go to mobile workers residing in other nearby jurisdictions, or to new residents who have chosen to migrate to the county (perhaps in direct relation to the employment growth)?

Historically, much of the impact assessment literature has assumed, often implicitly, that all new jobs that a new firm brings to a locality are taken by residents of that locality (Burchell, Listokin, and Dolphin; Siegel and Leuthold). But given that workers are mobile, it seems eminently more reasonable to assume *a priori* that employment growth in a given community will actually be partitioned between current residents of that community, new residents (in-migrants), and non-resident commuters.

Recent analysis of county-level commuting and employment data from the 1980s for North Carolina indicated that a very large fraction of the adjustment of labor supply – 60 to 80 percent – is accounted for by changes in commuting flows, and most of the remainder (20 to 30 percent) is accounted for by migration (Renkow, 2003). The important implication of that work is that, at least for the specific case of North Carolina in the 1980s, the fiscal impacts of employment growth associated with changes in residential demands for publicly provided services and residential provision of property tax revenues were substantially smaller than is commonly supposed.

The analysis presented below extends this line of research to encompass the thirteen states comprising the Southern United States.[1] I estimate a county-level labor market model to quantify the spatial partitioning of employment growth during the 1990s, making use of the 2000 Journey to Work data recently released by the Census Bureau. The labor market model explicitly accounts for movements of workers across county lines – in addition to within-county labor market adjustments – when a labor demand shock takes place. The model features structural equations for in-commuting, out-commuting, labor force size, and local

[1] Those states include Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, and West Virginia.

unemployment, relating these variables to employment changes and migration while controlling for spatial wage and housing price differentials and the spatial distribution of workers and employment opportunities within the larger regional labor market in which the county is located. The model thus allocates newly created jobs between residents of nearby counties and local residents, the latter group comprising both residents currently working outside the county and new entrants into the local labor force (including in-migrants).

The model is estimated in first differences using a two-period panel of data for the 1,112 Southern counties in 1990 and 2000. Econometric results indicate that between 60 and 70 percent of the adjustment of labor supply to new employment opportunities is accounted for by changes in commuting flows, and that the remainder (30 to 40 percent) is accounted for by labor force growth. Interestingly, the results additionally indicate that employment growth is *positively* associate with unemployment growth, the implication being that there is some "over-shooting" in the adjustment of labor force to new employment opportunities. I conclude from this that the fiscal impacts of employment growth associated with changes in residential demands for publicly provided services and residential provision of property tax revenues will be substantially smaller than is commonly supposed.

Significant rural-urban differences are found to exist, as well, particularly in regards to commuting flows. The econometric results suggest that a much greater share of new jobs in metro counties are filled by (non-resident) in-commuters than is the case for rural counties, while employment growth in rural counties appears to be accommodated to a much greater extent by reductions in out-commuting. Thus, while employment growth in rural counties may lead to smaller fiscal impacts than is often supposed, employment growth in nearby counties represents

an important countervailing factor that also tends to be overlooked in economic and fiscal impact analyses.

The paper is organized as follows. The next section provides an analytical framework capable of isolating the allocation of new jobs in a local economy. Next, an empirical model is suggested for implementing the analytical framework. Following discussions of data used, estimation results are presented and discussed. Some concluding remarks are found in the final section.

Analytical Framework

Accurately modeling the local economic and fiscal impacts of employment growth requires knowledge of who actually gets those new jobs. Early fiscal impacts models tended to assume – often implicitly – that local labor markets cleared internally in the sense that the new jobs that a firm or industry brings to a community are taken entirely by residents of the community (Burchell, Listokin, and Dolphin; Siegel and Leuthold). The new employees might be new residents (in-migrants). In this case employment growth within a county translates into a one-to-one increase in population (or greater, to the extent that dependents are associated with new workers), and with it a concomitant rise in the demands for publicly provided goods and services. Alternatively, the new employees might be current residents of the county, either emerging from the ranks of the unemployed or newly entering the labor force. In this case, population would remain constant, and demands for publicly provided goods and services would increase by a much smaller amount.

While at the state level the great bulk of newly created jobs appear to go to in-migrants – at least in the long run (Blanchard and Katz; Bartik, 1993) – the situation is likely to be much more

complex at a lower level of spatial aggregation. A significant and growing proportion of workers commute substantial distances between home and work. In the South, the 28 percent of workers crossed county lines to go to work in the year 2000. These figures range from 17 percent of workers in Florida to over 40 percent of workers in Georgia and Virginia (Figure 1). Underlying this trend is a continuing de-linking of residential choice and employment choice decisions. Recent empirical work points to a number of factors underlying this phenomenon, including increasing importance of amenities in residential choice decisions, continuing declines in the cost of transportation, ever-increasing mobility of American workers, and the growth of dual income households (Shields; Swenson and Eathington; Renkow and Hoover).[2]

To model the market level response of labor demand shocks, I employ the analytical framework that underpins the fiscal and economic impact models of Johnson, Scott, and Ma; Swenson and Otto; and Yeo and Holland. Consider a spatial labor market composed of mobile workers living in a multiple-county commutershed. Workers are assumed to be able to move between counties in response to changes in employment and residence opportunities within the multi-county area. Thus, a working person may choose to live and work in the same county, or s/he may live in one county and commute to another.[3]

Within a given county, total employment at time t (EMP_t) is accounted for by individuals who both live and work within the county (L_t^H) plus workers who commute in from nearby counties ($INCOM_t$):

(1) $EMP_t = L_t^H + INCOM_t$

[2] In addition, theoretical work by Zax suggests that given positive relocation costs, households are less likely to simultaneously change residence and workplace *within* a given geographical region than they are to only change workplace.

[3] In this paper "commuting" refers to crossing county lines to go to work.

The labor force (LF_t) within a given county is composed of individuals who both live and work in the county, workers who live in the county but work in a different county ($OUTCOM_t$), and unemployed persons ($UNEMP_t$):

(2) $LF_t = L_t^H + OUTCOM_t + UNEMP_t$

Combining these expressions yields an identity partitioning a county's labor force:

(3) $LF_t = EMP_t - INCOM_t + OUTCOM_t + UNEMP_t$

Totally differentiating (3) and re-arranging makes it clear that aggregate labor market responses to an employment shock in a particular county can take a variety of forms, including changes in the number of in-commuters and out-commuters, changes in the level of unemployment, and changes in size of the labor force:

(4) $dEMP = dLF + dINCOM - dOUTCOM - dUNEMP$

Equation (4) demonstrates the multiplicity of effects that may accompany employment shocks within a given county. The size of the labor force might change due to migration response and/or changes in participation rates. Unemployment rates may change. And adjustments in the volume of both out-commuting and in-commuting may occur. In-commuting adjustments are of particular interest. In the context of standard economic impact analysis, they represent "leakages" that would attenuate the impact of changes in labor demand on final demands. In the context of fiscal impact analysis, the in-commuting adjustments would tend to reduce both the demands for publicly provided services and the contribution of tax revenues (especially property tax revenues) associated with labor demand shocks. The empirical analysis is oriented toward quantifying these adjustments.

Empirical Model

I posit the following set of equations describing changes in in-commuting, out-commuting, unemployment, and labor force size within a given county i:

$$\textbf{(5)} \quad \Delta INCOM_i = f^I(\underset{+}{\Delta EMP_i}, \underset{?}{\Delta LF_i}, \underset{+}{\Delta CZLF_i}, \underset{+}{\Delta RWAGE_i}, \underset{+}{\Delta RHOUSE_i}, \underset{+}{METRO_i})$$

$$\textbf{(6)} \quad \Delta OUTCOM_i = f^O(\underset{-}{\Delta EMP_i}, \underset{?}{\Delta LF_i}, \underset{+}{\Delta CZEMP_i}, \underset{-}{\Delta RWAGE_i}, \underset{-}{\Delta RHOUSE_i}, \underset{+}{METRO_i})$$

$$\textbf{(7)} \quad \Delta LF_i = f^L(\underset{+}{\Delta EMP_i}, \underset{+}{\Delta CZEMP_i}, \underset{+}{\Delta RWAGE_i}, \underset{-}{\Delta RHOUSE_i}, \underset{+}{METRO_i})$$

$$\textbf{(8)} \quad \Delta UNEMP_i = f^U(\underset{?}{\Delta EMP_i}, \underset{-}{\Delta CZEMP_i}, \underset{?}{\Delta RWAGE_i}, \underset{+}{METRO_i})$$

where

$CZLF_i$ = labor force in other counties within county i's commuting zone

$CZEMP_i$ = total employment in other counties within county i's commuting zone

$RWAGE_i$ = the wage in county i relative to other counties within the same commuting zone

$RHOUSE_i$ = the cost of housing in county i relative to the cost of housing in other counties within county i's commuting zone

$METRO_i$ = a dummy variable equal to 1 for metro counties and 0 for rural counties

The expected signs of the first derivatives are given underneath the individual variables. The employment variables *EMP* and *CZEMP* are taken to be proxies for labor demand within the county and within the larger commuting zone within which the county is located.[4] Hence, a positive shock to within-county employment (ΔEMP) is expected to have a positive impact on in-commuting and a

[4] I employ the 1990 delineation of commuting zones established by Killian and Tolbert.

negative impact on out-commuting, while a positive change in *CZEMP* is expected to have a positive effect on the number of out-commuters.[5] Changes in both employment variables (ΔEMP and $\Delta CZEMP$) are further expected to be positively related to changes in the size of the labor force through effects on in-migration and participation rates. The likely impact of ΔEMP and $\Delta CZEMP$ on unemployment are ambiguous, depending on whether employment growth causes the labor force size and/or labor force participation to grow by more than the number of new jobs created.

The inclusion of the labor force change variable (ΔLF) in the two commuting equations captures the relationship between commuting and migration. The sign of its coefficient is indeterminate *a priori*; it depends on whether commuting and migration are substitutes or complements (Evers). An example of substitution between commuting and migration is the case in which positive local labor market shocks were to simultaneously lower the propensity of households to out-commute and increase the rate of in-migration – i.e., when a strong local economy *pulls in* new residents and new workers. In this event, the sign on the migration variable would be negative in the out-commuting equation and positive in the in-commuting equation. Coefficients would be of the opposite sign when commuting and migration are complements – e.g., when net in-migration into a county is a reflection of suburbanization and exurbanization.

Changes in relative wages are expected to exert a positive influence on in-commuting and a negative influence on out-commuting. *Ceteris paribus*, higher relative wages may be expected to draw in workers from nearby counties and make employment opportunities in other counties comparatively less attractive to out-commuters. Higher wages are also expected to have a positive impact on labor force size by stimulating both in-migration and greater labor force participation

[5] Similarly, the size of the labor force in other counties within the commuting zone is indicative of the pool of potential workers; hence $CZLF_i$ is expected to be positively related to $INCOM_i$.

rates.[6] Their effect on unemployment is ambiguous, however, depending on whether the positive impacts on labor force size cause more laborers to enter the market than can be accommodated by greater employment opportunities underlying wage increases.

Changes in relative housing prices are also included in the in-commuting, out-commuting, and labor force equations. Increases in the relative cost of housing in a county is expected to increase the likelihood that individuals employed within that county choose to live elsewhere. Thus, the sign of the coefficient on the housing cost variable ($\Delta RHOUSE$) is expected to be positive for in-commuting and negative for out-commuting and labor force.

Finally, in order to account for rural-urban differences (including possible agglomeration economies in urban labor markets and other time-varying fixed effects) a dummy variable taking the value of 1 for a metro county and 0 for a rural county is included. The metro dummy is expected to have positive coefficients in all cases.

Data and Variable Construction

The empirical model was implemented using 1990 and 2000 county-level data for the 13 Southern states. The analysis also employed data from a handful of counties in adjoining states that belong to commuting zones also containing Southern counties. These include 2 counties in Illinois, 6 counties in Indiana, 10 counties in Kansas, 9 counties in Maryland, 10 counties in Missouri, 14 counties in Ohio, 2 counties in Pennsylvania, 9 counties in Texas, and the District of Columbia.

[6] Strictly speaking, labor force participation is a function of the real wage within the county and its relationship to the average reservation wage of the county's workers. However, proxy for the relative wage used here – the mean county wage relative to the commuting zone average – will pick up this effect, since a change in our constructed wage variable will be dominated by within-county wage movements.

The commuting and employment data came from the Journey-to-Work files of the Census Bureau. County-level data on population, unemployment, labor force size and average yearly wages were taken from the BEA's Regional Economic Information System. Employment and wages are the number of full time job equivalents by place of work, while labor force and unemployment data are by place of residence. Commuting zone employment (*CZEMP*) for each county was calculated as the total employment within the county's commuting zone net of county employment. Commuting zone labor force (*CZLF*) data were similarly constructed. Designation of metro and rural counties is based on the BEA's 1990 definition. By this definition, the South is composed of 310 metro counties and 802 rural counties.

Relative wages were based on the county average earnings per worker reported by the BEA. The relative wage variable ($RWAGE_i$) was computed as the ratio of the average earnings per worker in county i to the commuting zone average. This is similar to the procedure used by Tokle and Huffman for measuring relative wages in their study of male and female labor force participation.

Relative housing costs were computed using Census data on the median price of a single family house in each county. Each county's median house price was divided by the weighted average of median prices for all counties within the relevant commuting zone (the weights being the number of housing units in each county).

Table 1 presents summary statistics, broken down by metro and rural counties. These indicate substantial variation in all workforce and population size components, and considerably less spatial variation in wages and housing prices. Not surprisingly, all figures are larger for metro counties than for rural counties; t-tests confirmed that these differences are significant.

Results

Equations (5) - (8) were estimated by three stage least squares. An advantage of estimating the model in first difference form is that it effectively eliminates time-invariant county fixed effects that are difficult to measure. Endogenous variables in the system included the first differences (2000 – 1990) of the four dependent variables – in-commuting ($\Delta INCOM$), out-commuting ($\Delta OUTCOM$), labor force size (ΔLF), and unemployment ($\Delta UNEMP$) – as well as employment changes (ΔEMP).[7] The instrument set included 1990 values of county population, population density, housing price, relative wage, commuting zone labor force and employment, county area, and the metro dummy.

The system was constrained to satisfy the identity partitioning changes in county employment into its component parts (equation 4). This meant imposing the cross-equation restriction $\beta_I - \beta_O + \beta_L - \beta_U = 1$ where β_I, β_O, β_L, β_U denote the coefficients on employment in the in-commuting, out-commuting, labor force, and unemployment equations, respectively.

A primary point of interest here is in ascertaining whether or not there are significant rural-urban differences in how local labor markets accommodate employment growth. For this reason, a dummy variable taking the value of 1 for a metro county and 0 for a rural county was interacted with ΔEMP. Additionally, based on existing evidence of significant rural-urban differences in the response of commuting and migration to various factors (Renkow and Hoover), the in-commuting, out-commuting, and labor force regressions included variables interacting the metro dummy with relative wages and relative housing prices.

[7] Wu-Hausman tests unequivocally rejected the null hypothesis that ΔEMP was exogenous. However, the exogeneity of $\Delta RWAGE$ could not be rejected.

Table 2 presents the regression results. The data fit the model well, as indicated by a system weighted R^2 of .545. In the main, parameter estimates were significant and of the hypothesized sign. Exceptions include the estimated coefficients of rural wage and housing prices in the commuting and labor force equations, which were statistically significant and of the wrong sign.

Examination of the interactive dummies indicates that significant rural-urban differences exist in the response of the commuting variables to changes in employment. The positive impact of increased employment on in-commuting is significantly greater for metro counties than rural counties. In other words, a relatively greater fraction of new jobs in metro counties are filled by (non-resident) in-commuters than is the case for rural counties. In contrast, the negative relationship between out-commuting and employment is more pronounced in rural areas.

Both of these findings are consistent with the strong complementary relationship between commuting and migration reported by Renkow and Hoover – a phenomenon which they link to growing exurbanization of rural counties located close to metropolitan centers. The negative relationship between in-commuting and labor force growth and the positive relationship between out-commuting and labor force growth is similarly supportive of this complementarity.

The key empirical result of interest here lies in a comparison of the relative size of the response of the dependent variables to changes in employment. Given the cross-equation restriction forcing the employment coefficients to sum to one (as indicated in equation 4), the relative magnitudes for rural counties can be read directly off the first row of Table 2; for metro counties, employment responses are the sum of the coefficients on the employment and employment × metro dummy variables in each of the four regression equations.

The implied responses of changes in in-commuting, out-commuting, labor force size and unemployment to employment growth are summarized in Table 3. There it will be observed that

the bulk of labor market adjustment to employment growth – 68.9% in rural counties and 62.7% in metro counties – is accounted for by changes in commuting flows. Changes in labor force size – in-migration plus any increases in labor force participation – accounts for the remainder of labor market adjustment. Interestingly, the results additionally indicate that employment growth is *positively* associate with unemployment growth, the implication being that there is some "over-shooting" in the adjustment of labor force to new employment opportunities.[8]

These findings have important implications for assessing the economic impact of employment growth within a county. The fact that between one-third and one-half of new jobs are accommodated by increased in-commuting suggests that leakages associated with employment shocks are substantial. Failure to take account of these leakages translates into overstatement of increases in final demands for the county in which the shock occurs. Of course, were the spatial unit of observation to expand from county to, say, commuting zone, the magnitude of this overstatement would be attenuated.

The implications for assessing fiscal impacts of employment growth are perhaps even more striking. There has been a tendency in the impacts literature to assume that employment growth translates into population growth at least as large as the number of new jobs (or greater to the extent that workers have dependents). The results here offer a starkly contrasting view, indicating that in-migration accounts for only about 35 percent of rural employment growth and 42 percent of metro employment growth.[9] As such, fiscal impacts associated with changes in

[8] One possible source of this overshooting would be in-migrating dual worker households whose migration resulted from a job opportunity for only one of the household's workers.

[9] Note that this is an upper bound that takes any increase in the size of the labor force to be the result of in-migration. Any positive impact of employment growth on labor force participation rates will reduce this estimate.

both residential demands for publicly provided services (e.g., schools) and residential provision of tax revenues (e.g., property taxes) will in fact be quite a bit smaller than is usually supposed.

At the same time, however, the results here also point to substantial spatial spillovers accompanying employment growth. The greater responsiveness of metro in-commuting and rural out-commuting to employment growth that was noted earlier suggests that rural counties may in fact bear a larger share of these spillovers. The extent to which metro employment growth stimulates population growth and associated increases in residential development in nearby rural counties has potentially important implications for local public finance in those rural counties. While employment growth in rural counties may lead to smaller fiscal impacts than is often supposed, employment growth in nearby counties represents an important countervailing factor – one that also tends to be overlooked in economic and fiscal impact analyses.

Concluding Remarks

In this paper a county labor market model has been estimated that explicitly accounts for movements of workers across county lines – in addition to within-county labor market adjustments – when a labor demand shock takes place. The model allocates newly created jobs between residents of nearby counties and local residents, the latter group comprising both residents currently working outside the county and new entrants into the local labor force (primarily in-migrants). The model was estimated using county level data from thirteen Southern states for the period 1990 – 2000.

The econometric results indicate that roughly one-quarter of new rural jobs and one-half of new metro jobs are filled by (non-resident) in-commuters. Failure to take account of these "leakages" in economic impact analysis would lead to significant overstatement of changes in

final demands resulting from employment shocks. The empirical results also indicate that between 60 and 70 percent of the adjustment of labor supply to new employment opportunities is accounted for by changes in commuting flows (including both increased in-commuting and reduced out-commuting), and that in-migrants account for the remainder. From this, it is reasonable to conclude that fiscal impacts associated with residential demands for publicly provided services (e.g., schools) and residential provision of tax revenues (e.g., property taxes) will in fact be quite a bit smaller than is usually supposed.

Significant rural-urban differences were found to exist in labor market adjustments to employment growth. A relatively greater fraction of new jobs in metro counties are filled by (non-resident) in-commuters than is the case for rural counties, while employment growth in rural counties appears to be accommodated to a relatively greater degree by reductions in out-commuting. These findings are consistent with the growing exurbanization that has accompanied a geographic expansion of urban labor markets in the South to encompass nearby rural areas. The fiscal impacts on rural counties affected by this exurbanization can be substantial.

It thus appears to be the case that while employment growth within individual rural counties may lead to smaller fiscal impacts than is often supposed, employment growth in nearby counties – especially urban counties – represents an important countervailing factor, one that also tends to be overlooked in economic and fiscal impact analyses. The relative size of these two sources of "measurement error" will vary depending on the geographic unit of observation. Future research will seek to isolate these magnitudes on a state by state basis.

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Table 1. SAMPLE STATISTICS

Variable	Mean	Coefficient of Variation	Minimum	Maximum
	---------- Metro counties (n=310) ----------			
2000 Labor force	81,046	1.40	3,481	980,632
2000 Employment	78,844	1.54	1,506	952,664
2000 In-commuters	23,316	1.71	490	446,780
2000 Outcommuters	21,170	1.25	1,673	233,701
2000 Unemployment	4,348	1.66	129	85,728
2000 CZ employment	471,212	1.15	41,954	2,573,125
2000 Population	166,048	1.42	6,926	2,253,362
2000 Real wage[a]	26,463	0.18	17,725	51,716
Δ Real wage 1990-2000[a]	3,269	0.74	–7,835	21,600
2000 Real median house price[a]	101,690	0.52	47,100	673,100
Δ Real house price 1990-2000[a]	17,596	2.11	-84,242	413,655
	---------- Rural counties (n=802) ----------			
2000 Labor force	11,558	0.86	792	67,833
2000 Employment	9,824	1.03	314	65,569
2000 In-commuters	2,383	1.09	73	22,822
2000 Outcommuters	3,367	0.75	194	24,479
2000 Unemployment	750	0.87	24	5,013
2000 CZ employment	127,987	1.64	2,965	2,573,125
2000 Population	26,506	0.81	2,077	139,277
2000 Real wage[a]	21,834	0.15	14,396	41,252
Δ Real wage 1990-2000[a]	2,504	0.74	–7,967	15,444
2000 Real median house price[a]	63,474	0.38	20,800	295,700
Δ Real house price 1990-2000[a]	9,788	1.64	–18,832	223,998

a. Wages and housing price expressed in 1999 dollars using the U.S. Department of Commerce's GDP deflator.

TABLE 2 REGRESSION RESULTS [a]

Variable	Dependent variable: In-commuting	Out-commuting	Labor Force	Unemployment
County employment	0.273 ***	–0.416 ***	0.349 ***	0.039 ***
	(7.47)	(11.60)	(24.4)	(9.60)
County labor force	–0.031	0. 499 ***	—	—
	(0.65)	(10.54)		
Commuting zone employment	—	0.009 ***	0.014 ***	0.006 *
		(7.43)	(7.61)	(1.67)
Commuting zone labor force	0.004 ***	—	—	—
	(3.44)			
Relative wage[b]	-0.116 **	0.045	-0.230 ***	-0.041 ***
	(2.43)	(1.03)	(2.84)	(2.59)
Relative housing price[b]	-187.7	2029.1 ***	-1258.2	
	(0.25)	(2.62)	(0.91)	
Metro dummy	-1980.0 ***	673.6 ***	564.6	-496.7 ***
	(7.30)	(2.67)	(1.26)	(5.66)
Employment × metro dummy	0.256 ***	0.318 ***	0.067 ***	0.005 *
	(30.4)	(45.0)	(14.3)	(1.82)
Wage × metro dummy	0.551 ***	-0.438 ***	1.489 ***	0.094 ***
	(7.53) ***	(6.50)	(12.1)	(3.84)
Housing price × metro dummy	2078.7 **	-4737.8 ***	1161.8	
	(2.16)	(4.70)	(0.63)	
Intercept	1258.9 ***	220.5	890.5 *	–105.3
	(4.07)	(0.77)	(1.67)	(1.02)
R^2	.878	.688	.876	.410
N	1112	1112	1112	1112

a. These are three-stage least squares estimates; t-values are in parentheses. ***, **, and * denote significance at the .01 .05 and .10 levels respectively. System weighted R^2 = .545. Except for the metro dummy all variables are first differences (2000 value less 1990 value).

b. These are mean county values divided by commuting zone average values for wages and housing prices respectively. See text for detail.

TABLE 3. PROPORTION OF EMPLOYMENT GROWTH ACCOUNTED FOR BY DIFFERENT ACTIVITIES

Activity	Rural Counties	Metro Counties
Increased in-commuting	27.3%	52.9%
Decreased out-commuting	41.6%	9.8%
Increased unemployment	3.9%	4.4%
Increased labor force size	34.9%	41.6%

FIGURE 1. CROSS-COUNTY COMMUTERS AS A SHARE OF EMPLOYED WORKERS