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HOUSEHOLD MIGRATION, URBAN GROWTH, AND INDUSTRIALIZATION: THE UNITED STATES, 1850-1860

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ABSTRACT

This paper utilizes a national sample of nearly 1,600 households linked in the census manuscript schedules to investigate causes and consequences of migration to urban areas during the midst of America's industrial revolution. Although record linkage was limited to the subset of households that had at least one child in 1850, the data are relatively rich in socioeconomic information. A regional analysis of migration and occupational change shows that while established households were generally mobile, they were extraordinarily reluctant to commit labor to urban-industrial pursuits. The evidence suggests that the presence of children, retraining costs, lack of control over fertility, risk aversion, and an unfavorable view of urban areas by rural residents contributed to their avoidance of cities and towns. The findings also contribute to debates over the compression of the wage structure and the extent of socioeconomic mobility.

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Urbanization was unquestionably important for the economic, social, political, and demographic development of the United States during the 19th century. The rise of production and distribution centers, the supply of labor and its geographic distribution, the emergence of labor unions, the operations of urban political machines, and the public health movement are examples of familiar themes associated with urbanization in American history. The importance of migration to urban growth is also indisputable. Because birth rates were low but death rates were high, migration fueled urban growth during the 19th century. Indeed, many cities and towns would have declined in size without an inflow of people that replaced the excess of deaths over births.

Study of migration and urban growth has been hampered by lack of suitable data. Systematic registration of births and deaths was scanty before the end of the 19th century and, unlike some European countries, the United States never had a system of migration registration. Instead, scholars have utilized various data collected for other purposes. For example, a measure of migration called the persistence ratio has been widely calculated by tracking names through manuscript schedules, city directories, and other sources. Though popular for its modest data collection requirements, this measure incorporates amounts of mortality and underenumeration that are usually uncertain and is silent on where people went or what happend to them after moving. Moreover, efficiency in data collection and availability of records have directed efforts toward studies of particular urban areas, often large cities. Though highly valuable, as a group these local studies frequently involve diverse data sources, different time periods, and contrasting methodologies, all of which complicate comparisons of results. From the ingredients of local studies and the

emphasis on cities at the expense of towns and villages it has been difficult to weave a coherent and complete picture of urbanization. A national study that included towns and villages as well as cities would help to unify research on urban development.

This paper utilizes a national sample of nearly 1,600 households linked in the census manuscript schedules to investigate causes and consequences of migration to urban areas during the midst of America's industrial revolution. Although record linkage was limited to the subset of households that had at least one child in 1850, the data are relatively rich in socioeconomic information. A regional analysis of migration and occupational change shows that while established households were generally mobile, they were extraordinarily reluctant to commit labor to urban-industrial pursuits. The evidence suggests that the presence of children, retraining costs, lack of control over fertility, risk aversion, and an unfavorable view of urban areas by rural residents contributed to their avoidance of cities and towns. The findings also contribute to debates over the compression of the wage structure and the extent of socioeconomic mobility.

I. REGIONAL PATTERNS OF URBANIZATION

Although the United States as a whole urbanized rapidly during the mid 19th century and a major branch of the development literature stems from rural-urban two-sector models, evidence on regional patterns of urbanization and information on regional patterns of specialization and development suggest that a regional approach to rural-urban migration would be productive for the United States. Statistical tests on household migration patterns, reported in later sections of the paper, confirm that a regional

approach is appropriate. Data reported in Table 1 convey the overall picture and the regional contrasts. The proportion of the population living in urban areas, defined as incorporated places of 2,500 or more residents, increased more than five fold, rising from slightly over 6 percent early in the century to nearly 40 percent by 1900. The annual rate of growth of population in urban areas peaked at 6.5 percent during the decade of the 1840s but was also high (5.6 percent) during the 1850s. The regional pictures were quite different, however. The share of population living in urban areas exceeded 18 percent in the Northeast by 1840 but this level was not exceeded in the North Central states until 1870 and in the South until 1900. The demographic evidence on the regional pace of urbanization accords well with regional patterns of industrial development. The South was dotted with commercial towns and also had a few small cities but remained devoted to agriculture throughout the century. The process of industrialization undoubtably began in the Northeast, perhaps within a decade or two following the War of 1812 but surely by the 1840s, depending on one's definition and emphasis. Mercantile towns were generally numerous in the settled portion of the North Central region by the 1830s while aspects of industrial activity were clearly evident in that region by the 1850s.

High rates of urban growth characteristic of the early years of settlement outside the Northeast are somewhat misleading as an overall guide to change because the population base was small. The urban population rapidly reached 16 percent of the total in the West before the Civil War, for example, but less than 2 percent of the nation's population lived in that region in 1860. Therefore the number of people who moved to urban areas in the West was relatively unimportant for the national picture during the antebellum period. For this reason and because there are few

observations in the sample for study of rural-urban movement in the West, this region is omitted from the analysis of household migration.

During the sample period of 1850 to 1860 one would expect to find that rates of household migration to urban areas were highest in the Northeast, followed by the North Central and the South regions. Moreover, the Northeast should have been characterized by migration related to industrial activity, the South by movement for commercial lines of employment, and the North Central region by a hybrid of purposes.

II. A FRAMEWORK AND PERSPECTIVE

Although several frameworks for the study of migration have been proposed during the past century, including Ravenstein's "laws," gravity models, push and pull approaches, and explanations focusing on intervening opportunities, economic motives are a prominent theme in migration research. Broadly and properly interpreted, Larry Sjaastad's formulation of migration as an investment encompasses and recasts what appear to be diverse approaches to the subject.[1] In Sjaastad's view, the money costs of the investment include expenditures on food, lodging, and transportation, and the nonmonetary costs include foregone earnings while traveling, searching for and learning a new job. Psychic aspects include net losses from leaving family, friends, and associates and also incorporate perceptions and appraisals of the general environment at the place of origin relative to potential destinations. Obviously the overall psychic price of a move could be positive or negative. The returns include a positive or negative increment to a real earnings stream attributable to a change in earnings; a

change in the costs of employment; or a change in the prices paid by or received by the migrant.

Variables that may influence the costs and returns and the rate of return on the investment include:[2] (1) Age. Excluding retirement migration, the probability of movement ordinarily declines after the late teens and early twenties in part because the horizon over which returns are realized from migration declines with age. It has also been argued that the transactions costs of moving, psychic costs and possibly risk aversion may rise with age; (2) Education. Awareness of and response to economic opportunities elsewhere and ability to adapt to a new environment rises with education; (3) Wealth. The ability to finance a move rises with wealth, but the transactions costs of moving may also rise with wealth so the net effect of this variable is unclear; (4) Family status. A spouse and children add to the cost of a move, but it is possible that higher earnings for the spouse and children of working age could more than offset the higher costs; (5) Occupation. Highly skilled and specialized occupations tend to have thin markets, which may increase the costs of finding employment elsewhere. Higher migration rates may be associated with declining or emerging occupations; (6) Ethnicity. The foreign-born and particularly recent immigrants may have had fewer or less effective channels to acquire information about employment opportunities than native-born and may have spent more time searching, via migration, for employment. Alternatively, the number of communities of the same ethnic background but in different localities that existed to facilitate adjustments to migration may have been smaller for the foreign compared with the native-born.

Georgaphic patterns of wages are obviously relevant for migration decisions but unfortunately the available information is scanty. Evidence on the daily wages of common labor across states, examined by Stanley Lebergott, suggests that migrants responded to wage incentives and that regional differentials narrowed during the 19th century, pointing to the creation of a national labor market.[3] Reliable data on wage differrentials for a variety of occupations by areas as small as counties are simply unavailable, and thus wages cannot be incorporated formally into the statistical analysis. Instead, migration flows will be used to shed light on wage patterns.

European immigration, particularily from Ireland and Germany, was important to American population growth by the middle of the century and since many foreign-born located in urban areas, any analysis of rural-urban migration should recognize the impact of this group on urban labor markets. In this regard, the occupations and geographic patterns of settlement of the immigrants will be incorporated into the discussion.

Before considering determinants of migration, it is useful to discuss the overall plausibility of results from the household data. The extent of movement is an important dimension in this regard. In the sample of 1,581 households that were matched, 498 or 31.5 percent of those found in 1850 resided in a different county in 1860, which implies a level of persistence of 68.5 percent. Although studies have reported persistence rates as low as 20 to 30 percent among some population groups over a 10 year period during the nineteenth century, Donald Parkerson and David Galenson and Daniel Levy remind us that persistence measures embody downward biases of mortality and underenumeration that may amount to 20 to 30 percentage

points or more.[4] Moreover, single individuals and young couples without children generally had higher rates of mobility than established families. Thus, the implied persistence rate of 68.5 percent falls within a plausible range and suggests that the households in the sample were neither unusually mobile or immobile given their socioeconomic characteristics.

Patterns of rural to rural migration are a useful backdrop against which to study rural to urban movement. Table 2 presents the results of a logistic regression that explains rural to rural migration from 1850 to 1860.[5] The dependent variable is dichotomous and takes a value of 1 if the household resided in a different county in 1860 compared with 1850 and is 0 otherwise. The data base includes only those households that resided in a rural area in both censuses and the explanatory variables refer to values taken in 1850. Although the direction of effect of an independent variable on the dependent variable is the same as the sign of its coefficient, because the estimated relationship is nonlinear the practical significance of a variable may be difficult to discern from the magnitude of a coefficient. Therefore, a variable's impact will be assessed by evaluating other independent variables at their sample means and converting the information into expected probabilities. As anticipated, the chances of migration declined systematically with age and with wealth (value of real estate). The expected probability of migration fell from 36.8 percent at age 25 to 23.0 percent at age 50 while it was 32.5 percent among households with $100 of real estate, 21.8 percent at $5,000, and only 13.8 percent at $10,000.[6] The probabilities of movement were not significantly different among the foreign-born compared with native-born whites. Nor were free blacks less mobile than native-born whites; one might have hypothesized that

registration requirements and other impediments would have acted to reduce the movements of free blacks. Though negative as expected, the coefficient on illiteracy was not statistically significant. Children may have increased the costs of migration, but apparently the expected returns to their migration were such that no net systematic effect prevailed on the probability of household migration. Among occupational groups, only blue collar workers (expected probability equalled 37.0 percent) were systematically more mobile than farmers and other occupations (expected probability equalled 28.7 percent).[7] The chances of movement differed substantially across regions, taking on values of 15.7 percent in the Northeast, 43.4 percent in the North Central, 33.7 percent in the South, and 28.1 percent in the West. About 45.1 percent of these households resided less than 100 miles from their place of origin in 1850.[8] Rural to rural mobility was understandably low in the Northeast because most sites suitable for farming were already taken by 1850 and many of those who were interested in expanding farm operations had left the region by that date. The probability of movement was about 10 percentage points lower in the South compared with the North Central states, which contradicts, or at least does not support, claims that antebellum southern farmers were notorious for exhausting the soil and moving to new lands.

The technique of comparing expected probabilities by changing the value of one variable while holding others constant is useful for appraising practical significance, but it obscures the diversity within the sample. The wide range of expenience is made clear by changing the values of several variables. For example, among native-born, literate whites the chances of movement were 62.1 percent for a 25 year old, blue collar worker who had

$100 in real estate and resided in the North Central region, whereas it was only 7.5 percent for a 50 year old farmer who had $5,000 in real estate and resided in the Northeast.

Although the 1950 census defined an urban area as an incorporated place of 2,500 or more residents, there are several reasonable definitions of the term "urban." Because the major structural change in the 19th century was the transition from agriculture to industry, however, it is appropriate to focus on the exodus from agriculture. The existence of small manufacturing operations in what would be called "rural" areas by the 1950 census definition also suggests that a broad definition of "urban" is reasonable for study of change during the era of industrialization. Accordingly, "urban" is defined in this paper as a village, town, or city of any size that was enumerated by the census and rural to urban migration is defined as movement from a rural area to an urban area of any size.

The focus on the decline of agriculture is legitimate but obscures the interesting phenomenon of movement within urban areas. Which urban areas grew most rapidly? To what extent was there increasing concentration of populaton in major cities? Did small towns and villages act as feeders for larger urban areas? Though not the focus of analysis in this paper, Table 3 gives some perspective on these questions and on the definition of rural to urban migration. The first row of the table shows that those who no longer resided in rural areas after 1850 tended to avoid large cities; about 42 percent went to villages (under 2,500) while only 11 percent went to places of 25,000 or more. Though qualified by the fact of small sample sizes, the available evidence supports the hypothesis of upward movement to larger urban areas; over one-half of those who resided in an urban area of less than 2,500, for example, resided in a larger urban place in 1860. The

feeder pattern occurred in striking contrast to reverse migration; virtually all of those who did not move up or remain within the same category moved to a rural area. Almost without exception the smaller cities and towns were not repositories for those who departed from larger urban areas.

The finding that 43 percent of those who resided in urban areas in 1850 resided in rural areas in 1860 appears to be consistent with Frederick Jackson Turner's hypothesis that the frontier acted as a safety-valve for urban labor. However, none of those who left eastern urban areas moved to the frontier.[9] Rural areas may have been an outlet for urban labor but the frontier was tangential to the process, at least for established households during the time period from 1850 to 1860.

III. RURAL TO URBAN MIGRATION

Of the 1,429 households residing in rural areas in 1850, 6.9 percent resided in urban areas in 1860. Though rural to urban migration rates were low throughout the sample, the extent of movement differed by region, varying from 9.2 percent in the Northeast, to 6.0 percent in the North Central, and 6.9 percent in the South.[10]

Of those who moved from a rural to an urban area, only 30.3 percent departed from their county of residence in 1850 and of these 63.0 percent traveled less than 100 miles. The importance of local migration to urbanization during the decade of the 1850s contrasts with a later era. By 1940 and 1950 the majority of migrants to urban areas probably originated outside the state.[11]

Data reported in Table 4 explain rural to urban movement in terms characteristics of the household head. In this and other logistic

regressions in the paper, the dependent variable is dichotomous and takes a value of 1 if the household moved. The strong negative association of age and wealth observed for movement from rural to rural areas is absent from the rural to urban movers. Indeed, the table shows that five out of six coefficients on these variables were positive. As expected, children impeded movement to urban areas; all six coefficients on the chilren's variables were negative, however only two were statistically significant. Although it is well-known that the foreign-born populated cities, their migration behavior from rural areas was not systematically different from that of the native-born.[12] Cities, towns, and villages throughout the country systematically absorbed white collar and blue collar workers from rural areas, but the rate of flow was greatest in the Northeast. In that region the expected probability of migration to an urban area was 1.6 percent for farmers and other occupations but 21.3 percent for white collar workers and 16.9 percent for blue collar workers. In the South the chances were 4.5 percent for farmers and other occupations, 17.3 percent for white collar workers and 10.4 percent for blue collar workers. The behavior of unskilled workers was not systematically different from farmers and other occupations in any region.

IV. URBAN TO RURAL MIGRATION

Of the 148 households that resided in an urban area in 1850, 63 households or 42.6 percent resided in a rural area in 1860.[13] Though high compared with the rate of 6.9 percent noted for rural to urban migration, the base for the reverse flow was small. Since 99 of 1,429 households moved

from rural to urban areas, there was a small net gain of established households in urban areas.

Table 5 depicts the results of logistic regression explaining urban to rural migration.[14] As was the case for rural to urban migraton, but unlike rural to rural migration, age and wealth had no systematic influence on urban to rural movement. The evidence on numbers of children and persistence in urban areas was mixed: only four out of six coefficients on the number of children were positive and only the one for children under 10 in the North Central states was statistically significant. The systematic retention of the foreign-born accords with perceptions of cities as concentration points for emigrants from Europe; in the Northeast, for example, the chances of outflow were 61.6 percent among native-born but only 5.6 percent among the foreign-born. With the exception of the Northeast there was no systematic retention according to city size. In that region the chances of outflow decreased from 77.1 percent for areas under 25,000 to 25.6 percent for cities of 25,000 but under 75,000, to 12.7 percent for cities of 75,000 and above. White collar and blue collar workers tended to persist in urban areas (all coefficients on these variables were negative), but with the exception of blue collar workers in urban areas of the South there were no statistically significant patterns of departure by occupation.

V. MIGRATION AND OCCUPATIONAL CHANGE

The extent to which 19th century America approached an egalitarian society has been an enduring source of animated debate.[15] One aspect of the controversy concerns the relationship between geographic mobility and social and economic mobility. Some insights into the issues are available from

data reported in Table 6. The table arranges the occupations reported in 1850 and 1860 of those who moved to or from urban areas and of those who persisted into a matrix of categories used in the analysis of migration (unskilled, farmer, blue collar, white collar, and other). Because the total number of observations is reasonably small, the meaning of "occupation" as listed by census enumerators is sometimes ambiguous, and the choice of occupational groupings is partly arbitrary, conclusions suggested by these data are necessarily tenative.[16] Given these qualifications, the results are consistent with the hypothesis that upward mobility accompanied movement to urban areas. About 13.0 percent of the stationary households moved upward while 21.7 percent of those who moved to an urban area rose in occupational classification.[17] Unfortunately the number of unskilled who moved to urban areas was very small and cannot be studied separately. However, it is notable that among those unskilled (essentially laborers) who did not migrate, 39 percent became farmers and about 23 percent became blue collar or white collar workers. Recalling that all of the unskilled were heads of established families in 1850, the finding that nearly two-thirds improved their position suggests that upward mobility in American society was not a process confined to the acquisition of skills or wealth in advance of family formation.

One half of those who were farmers in 1850 and who moved to urban areas continued to list farming as their occupation, while the other half were distributed among unskilled (13 percent), blue collar (16 percent), white collar (16 percent), and other occupations (6 percent). The farmers of urban residence presumably raised food for export to the city or town by

working near the outskirts of the urban area and, in addition, they may have engaged in nonagricultural pursuits on a part-time basis.

It is not surprising that the farmers who left urban areas usually remained devoted to farming. However, there was greater occupational shift among blue and white collar categories when moving away compared with movement into urban areas. About 43 percent of the former residents of urban areas who were blue collar workers switched to farming while about half as many (23 percent) of the white collar workers made this transition. High rates of outflow from urban to rural areas, the extent of the shift to farming among those who left urban areas, and the lack of mobility from larger to smaller urban areas (noted in connection with the discussion of Table 3) suggest that some of those who moved to urban areas may have had the intention of accumulating a grubstake for use in agriculture.

VI. IMPLICATIONS

There is widespread agreement that the United States was in the midst of industrialization during the 10 years after 1850, yet the package of evidence on the migration behavior of established households during this decade demonstrates the considerable reluctance of this group to commit labor to urban-industrial pursuits.[18] Evidence on the migration behavior of households in the sample, given in the last row of Table 7, shows that established households in rural areas declined by only 2.6 percent. Although urban households increased by 24.7 percent, total population in urban areas increased by 73.2 percent, which implies that the share of established households in the total population of urban areas declined during the decade from 1850 to 1860. While it is too strong to characterize

their behavior as an obstacle to industrialization, the supply of urban-industrial labor, and presumably the rate of industrialization, was less than it would have been had established households been more than modestly involved in urban labor force growth. Industrial expansion in urban areas was forced to cope with minor participation by a group that dominated the total labor force.

Why did established households add so little to labor force growth in urban areas? The answer cannot be found in a general reluctance to move: Over a 10 year period about 31.5 percent of all households in the sample resided in a different county. This rate of mobility is several times higher than the rural to urban rate of 6.9 percent, a pace which understates the actual contrast because over two-thirds of the moves in this measure occurred within the county of origin. Admittedly the rate of movement to urban areas was higher in the Northeast (9.2 percent) where industrialization was concentrated, but the conclusion that participation was small also holds for that region.

Instead, the search for an answer should begin in terms of the economic model that views migration as an investment. Their behavior suggests that established households did not perceive the financial and psychic package associated with movement to an urban area as a good investment. Exactly which components in the package weighed heavily in the decision-making process of established households is unclear, but the regressions and information on regional rates of growth suggest some insights into their priorities. One consideration is the presence of children. Data in Table 4 make clear that children, especially those below age 10, impaired rural to urban migration while information in Table 5 shows that young children tended to induce an outflow from urban areas. This

result can be interpreted in terms of the financial outlays and opportunity costs of caring for children in relation to their contribution to household income and services. Children were relatively costly in urban areas on this score.

A strong negative relationship between age of the household head and the chances of rural to rural migration was noted earlier. Yet, age did not systematically influence rural-urban migration: households headed by older men were about as likely to move to urban areas as those headed by younger men. Why were mobile households headed by older men relatively more likely to move to urban areas? One hypothesis consistent with this behavior is that migrants to urban areas were failures at agriculture or at other occupations characteristic of rural areas. Since the judgement of failure was reached after a period of experimentation, trial, and error, the migrants to urban areas were naturally older. Opposed to this line of thought is the finding that wealth, as measured by value of real estate, had no systematic influence on the chances of moving to urban areas. While it is possible that some migrants to urban areas were financial failures, the group included successful individuals as well. A different approach to the question highlights the costs and benefits of children in urban versus rural areas and therefore the importance of control over fertility as an ingredient in the decision to migrate. Although there is some evidence that family limitation may have been practiced in parts of the United States by the mid 19th century, the extent of the practice, and especially its effectiveness is questionable.[19] It is likely that most couples who might have contemplated a move to an urban area could not have controlled family size reliably. Under these circumstances some families may have delayed a

move until the biological clock either assured that additional children were not forthcoming or had significantly reduced the chances of conception.

Preferences expressed by rural-urban migrants for continuing a given line of work may also be understood within the investment framework. In addition to the costs of moving, changing occupations to a line of work suitable for urban areas may have required outlays and foregone earnings for retraining that were not feasible or possible for many prospective migrants. Risks of earnings loss could be added to the liabilities of moving to an urban area. Cities were unhealthy places of residence during the mid 19th century and the possibility of incapacitation through illness and poor health was probably greater for recent migrants.[20] Households that had incurred commitments for the care of children would have been understandably risk averse, and so retraining costs and the possibility of poor health could have weighed heavily in decisions to avoid urban areas. The finding that rural residents who were white collar or blue collar workers were more likely than farmers to move to urban areas is consistent with an important role for retraining costs and risk aversion. In this context, the acquisition of skills marketable in urban areas while living in rural areas may have been an important first step in the use of labor from established households in urban areas.

Table 7 shows that established households increased at a rate substantially below total population growth in urban areas of the Northeast and the North Central states while the rate actually exceeded total population growth in urban areas of the South. The rate of outflow from rural areas was also relatively high in the South. Why did the composition of migration to urban areas of the South include relatively more established

households? A complete answer to this question would require information on expected earnings and living costs by household type and region in rural and urban areas. While it is conceivable that considerations of cost and earnings alone could explain these migration patterns, the differences in migration were so large relative to likely differences in earnings and costs that other factors were probably involved. Perceptions of cities and the urban way of life in the mind of rural residents may have been among the other factors. The late antebellum period witnessed a moral crusade that intertwined themes of anti-slavery, temperance, and Christian principles of clean living. Evangelical Protestants were particularily effective in promoting the movement. Reinforced by anti-Papal sentiments, many northern rural Protestants saw their cities as dens of iniquity that were inhabited by foreigners, many of whom were Roman Catholics, and given to places of drinking, gambling, and vice. In this view cities would have been undesirable places for raising a family, regardless of the number of children. Rural southerners were also suspicious of the social and moral climate of cities but avoidance of urban areas may have been greater among northerners because their cities were larger and more likely to have been inhabited by foreigners and Catholics and because the antislavery campaign in that region strengthened the moral crusade. Although the Protestant ethic has been cited as promoting the development of capitalism, the ethic of Protestants may have inhibited the creation of an urban labor force during America's industrial revolution.

The distribution of income and related patterns of real wages during the 19th century have been a lively topic of research in recent years. Jeffrey Williamson and Peter Lindert have argued that inequality of wealth and income increased in the United States after 1820 through a process of

wage "stretching." Although an increase in the ratio of skilled to unskilled wages could have been caused by relatively rapid increases in the supply of unskilled labor associated with European immigration, which was particularily heavy from the mid 1840s through the mid 1850s, their general equilibrium analysis attributes the widening gap principally to different growth rates in the demand for labor. Specifically, they argue that capital accumulation and mechanization displaced the unskilled but favored skilled labor, which was need as a complement ot machinery. Others have debated the conceptual and the empirical basis of their claims.[21] The migration patterns discussed in this paper furnish indirect evidence on the controversy over whether the skilled wage premium increased. The phenomenon of "stretching" the wage structure required relatively inelastic supplies of skilled labor; the finding that established households were reluctant to move to urban areas is consistent with this requirement. The fundamental issue, however, is changes in demand relative to supply. If the rewards to skilled labor were increasing relative to unskilled labor in urban areas, then one would expect to observe higher rates of migration to urban areas by skilled compared with unskilled labor; this pattern of migration existed throughout the country and was particularily strong in the Northeast. In that region the chances of migration were insignificantly different for unskilled workers versus farmers and other occupations while the probability of movement was 1.6 percent for farmers and other occupations but 21.3 percent for white collar workers and 16.9 percent for blue collar workers.

VII. CONCLUDING REMARKS

Because migrants to urban areas during the 19th century were often unattached young adults, one may question the contribution of research on established households to the overall picture of urbanization.[22] Even though their patterns of migration were not studied, by implication and extension this research sheds light on aspects of young adult behavior. That larger numbers of children impeded movement to urban areas, for example, is consistent with the high rates of movement observed among the young and unattached. Assuming that responses to incentives were similar, or at least not perverse, rates of movement among the unattached, though higher in general, should have followed patterns broadly characteristic of established households. One would expect, regardless of family attachment, that rates of movement to urban areas were relatively higher among white collar and blue collar workers, and rates of urban persistence were relatively higher among the foreign-born and among those who resided in larger cities of the Northeast.

APPENDIX: THE DATA

A sample of households linked in the 1850 and 1860 census manuscripts was prepared to study urbanization, spatial patterns of mobility, and the selectivity of movement and their relationship to the functioning of labor makets and economic growth.[23] To help address diverse issues, the total sample consisted of parts selected according to criteria of area and population. The number of counties selected per state was proportional to the relative population of the state among all states in the area sample, while in the population sample it was proportional to the relative population of the state among all states. Ten households were selected at random from each county and at least one county was selected from each state for each sample. Households were sought from a total of 300 counties, of which 150 were allocated to each type of sample. All the information from the manuscript schedules was coded for 2,861 households. The total number falls short of 3,000 because the schedules for some counties did not exist, were not legible, or had less than 10 families meeting the criteria discussed below.

The approach to matching exploited the indexes of household heads that exist for each state enumerated in the 1850 census. These indexes, which were prepared by Accelerated Indexing Systems of Salt Lake City, are arranged alphabetically by last name and include the county of residence and the page number where the family was recorded in the manuscript schedules. However, many individuals could have had the same name, approximately the same age, and the same state of birth, and so additional restrictions were imposed on the selection of families from the 1860 census to assure identification in 1850. All households were sought in the same county and,

providing there were no more than 10 heads with the same name in the state, within the same state of residence as located in 1860, but it simply was not feasible to trace those not found in this way among the indexes for all states. Instead, those families selected from the 1860 schedules were required to have a child at least 10 years old. The reported state of birth of the youngest child greater than or equal to 10 acted as a pointer to the state where the family was likely to be found in 1850.

Of course, not all families were located by these methods. Of the 2,861 recorded from the 1860 census, 180 or 6.3 percent were not sought for reasons of a common name, and 59 percent of the remainder were found. In appraising these results it is important to distinguish losses that occurred through the equivalent of a random process (not systematically related to migration) from those that were attributable to the object of investigation (migration). Random losses merely increased the costs of data collection while losses attributable to migration could bias results. The incidence of common names was not systematically related to known determinants of migration such as wealth, age, and occupation.[24] About 25 to 30 percent, and concieveably more, of the 41 percent not found were unavoidable losses attributable to underenumeration in the 1850 census. Errors of omission and transcription in the census indexes and reporting errors in the 1860 census, which were arguably unrelated to migration, may have been the source of 60 to 70 percent of the matching failures. Approximately 31.5 percent of those matched in 1850 lived in a different county in 1860, and thus it seems likely that only a small share of potentially observable intercounty moves were lost through the matching procedure.

Table 1: Annual Growth Rates and Percent Urban by Region

	Northeast		North Central		South		West		United States	
Year	Rate	%	Rate	%	Rate	%	Rate	%	Rate	%
1800	4.3	9.3			6.1	3.0			4.7	6.1
1810	4.4	10.9		0.9	6.1	4.1			4.9	7.3
1820	2.3	11.0	13.3	1.1	3.6	4.6			2.7	7.2
1830	4.9	14.2	14.6	2.6	3.9	5.3			4.9	8.8
1840	4.7	18.5	11.3	3.9	4.3	6.7			4.9	10.8
1850	6.0	26.5	13.5	9.2	4.7	8.3		6.4	6.5	15.3
1860	5.0	35.7	9.3	13.9	3.6	9.6	21.6	16.0	5.6	19.8
1870	3.6	44.3	7.6	20.8	3.4	12.2	9.5	25.8	4.7	25.7
1880	3.0	50.8	4.4	24.2	3.0	12.2	7.5	30.8	3.6	28.2
1890	3.3	59.0	5.7	33.1	4.8	16.3	7.6	37.4	4.5	35.1
1900	3.0	66.1	3.2	38.6	3.0	18.0	3.6	40.6	3.1	39.7

Source: U.S. Bureau of the Census, Census of Population: 1950, Vol. I, Number of Inhabitants (Washington: USGPO, 1952), p. 1-17. The term "urban" encompasses persons living in incorporated places of 2,500 or more residents (see pp. xv-xvi).

Table 2: Explaining Rural to Rural Migration

Variable	Coefficient	t-value
Age	-0.0267	-2.52
Real Estate	-0.000111	-3.01
Black	0.716	0.84
Illiterate	-0.229	-1.04
Foreign-born	0.0483	0.19
No. Chil. < 10	-0.00587	-0.13
No. Chil. ≥ 10	-0.0330	-0.65
OCCUPATION		
White Collar	0.196	0.87
Blue Collar	0.379	2.18
Unskilled	-0.119	-0.46
REGION		
North Central	1.41	7.30
South	1.00	5.66
West	0.737	2.09
Constant	-0.542	-1.37
$-2 \log \lambda = 116.16$; d.f. = 13; Sig. level = 0.005; N = 1,330		

Source: Manuscript schedules of the 1850 and 1860 census.

Notes: Dependent variable = 1 if the county of residence in 1860 differed from that in 1850, 0 otherwise. The omitted variables are Farmer, Other Occupations and Northeast. The data base consists of households that resided in rural areas in both census years.

Table 3: Matrix of Residence by Size Categories, Entire Country from 1850 to 1860

Residence	Residence in 1860					
in 1850	Rural	1-2,499	2,500-9,999	10,000-24,999	25,000+	Total
Rural	1,330	42	21	25	11	1,429
1-2,499	24	5	5	1	0	35
2,500-9,999	15	0	13	1	1	30
10,000-24,999	9	0	0	5	7	21
25,000+	18	0	1	0	47	66
Total	1,396	47	40	32	63	1,581

Source: Manuscript schedules of the 1850 and 1860 census.

Table 4: Explaining Rural to Urban Migration by Region, 1850 to 1860

	Northeast		North Central		South	
Variable	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Age	0.0150	0.46	0.0326	0.97	0.0398	1.77
Real Estate	-0.000213	-1.16	0.000176	1.35	0.0000277	1.06
No. Chil. < 10	-0.203	-1.20	-0.710	-2.81	-0.129	-1.07
No. Chil. ≥ 10	-0.114	-0.71	-0.770	-2.15	-0.208	-1.70
Foreign-Born	0.625	0.84	-1.62	-1.33	0.344	0.52
OCCUPATION						
White Collar	2.81	3.88	0.846	1.06	1.49	3.83
Blue Collar	2.52	3.84	1.65	2.75	0.899	2.06
Unskilled	0.979	1.02	a		0.193	0.25
Constant	-3.773	-2.76	-2.559	-2.01	-3.895	-4.61
-2 log λ	40.96		26.18		26.12	
d.f.	8		7		8	
Sig. Level	0.005		0.005		0.005	
N	382		299		680	

Source: Manuscript schedules of the 1850 and 1860 census.

a. Of the 18 unskilled workers in this sample, none moved to a city or town.

Notes: Dependent variable = 1 if the household was enumerated by the 1850 census in a rural area and was enumerated by the 1860 census in a city, town, or village, 0 otherwise. The omitted variables are Farmer and Other Occupations. The data base consists of households who resided in rural areas in 1850 and in the region in question in 1860.

Table 5: Explaining Urban to Rural Migration by Region, 1850 to 1860

	Northeast		North Central		South	
Variable	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Age	-0.0138	-0.17	0.162	1.30	-0.0773	-1.30
Real Estate	-0.000121	-0.58	-0.000113	-0.68	-0.0000279	-0.38
No. Chil. < 10	0.668	1.44	2.11	2.30	-0.181	-0.71
No. Chil. ≥ 10	-0.770	-1.67	-0.0126	-0.02	0.344	1.26
Foreign-Born	-3.31	-2.84	-3.33	-1.70	-1.54	-1.58
CITY SIZE						
25,000-74,999	-2.28	-1.91	b		-1.14	-1.42
75,000+	-3.14	-2.83	1.06	0.70	-0.233	-0.22
OCCUPATION						
White Collar	-0.530	-0.42	2.06	1.16	-1.33	-1.14
Blue Collar	-0.370	-0.36	2.10	1.14	-2.37	-1.99
Unskilled	a		c		-2.53	-1.46
Constant	2.306	0.81	-11.185	-1.85	4.855	2.00
-2 log λ	34.49		19.26		14.72	
d.f.	9		8		10	
Sig. Level	0.005		0.025		0.15	
N	58		32		58	

Source: Manuscript schedules of the 1850 and 1860 census.

a. Of the seven unskilled workers in this sample, one moved to a rural area.

b. No observations in this category.

c. The one unskilled worker in this sample remained in an urban area.

Notes: Dependent variable = 1 if the household was enumerated by the 1850 census in an urban area and was enumerated by the 1860 census in a rural area, 0 otherwise. The omitted variables are City Size Under 25,000, Farmer, and Other Occupations. The data base consists of households that resided in urban areas of the region in question in 1850.

Table 6: Migration and Occupational Change, 1850 to 1860

Occupation in 1850	Occupation in 1860						
	Unskilled	Farmer	Blue Collar	White Collar	Other	Total(%)	N
	Rural to Urban Migration						
Unskilled	50	25	0	0	25	100	4
Farmer	13	50	16	16	6	101	32
Blue Collar	6	0	82	12	0	100	33
White Collar	0	0	12	88	0	100	25
Other	0	0	20	60	20	100	5
	Urban to Rural Migration						
Unskilled	50	50	50	0	0	100	2
Farmer	9	82	0	9	0	100	11
Blue Collar	4	43	43	4	4	98	23
White Collar	0	23	15	54	8	100	26
Other	0	0	0	0	100	100	1
	Stationary Households[a]						
Unskilled	36	39	18	5	1	99	77
Farmer	3	87	5	4	2	101	611
Blue Collar	7	21	60	7	5	100	167
White Collar	1	17	7	66	9	100	101
Other	64	11	11	11	4	101	28

Source: Manuscript schedules of the 1850 and 1860 census.

a. Remained within the county but did not move rural to urban or urban to rural.

Table 7: Net Growth Rates of Rural Households, Urban Households, and Urban Population by Region, in Percent from 1850 to 1860

Region	Rural Households	Urban Households	Urban Population[a]
Northeast	-2.1	17.8	65.5
North Central	-1.0	6.8	152.9
South	-3.6	43.9	43.4
Total	-2.6	24.7	73.2

Source: Manuscript schedules of the 1850 and 1860 census and U.S. Bureau of the Census, Census of Population: 1950, Vol. I, Number of Inhabitants (Washington, USGPO, 1952), p. 1-17.

a. Defined as residents of incorporated places of 2,500 or more.

1. Larry A. Sjaastad, "The Costs and Returns of Human Migration," Journal of Political Economy, 70 (1962 Suppl.), pp. 80-93.

2. The literature on migration is volumnious. General reviews of research in the area include Michael J. Greenwood, "Research in Internal Migration in the United States: A Survey," Journal of Economic Literature, 13 (June 1975), pp. 397-433; R. Paul Shaw, Migration Theory and Fact: A Review and Bibliography of Current Literature (Philadelphia, 1975); United Nations, Determinants and Consequences of Population Trends (New York, 1973), Chap. 6.

3. Stanley Lebergott, Manpower in Economic Growth: The American Record Since 1800 (New York, 1964), chaps. 3 and 4.

4. See, for example, Donald H. Parkerson, "How Mobile Were Nineteenth-Century Americans?" Historical Methods, 15 (Sum. 1982), pp. 99-110; David W. Galenson and Daniel S. Levy, "A Note on Biases in the Measurement of Geographic Persistence Rates," Historical Methods, 19 (Fall 1986), pp. 171-179.

5. Based on a likelihood-ratio test, the determinants of rural to rural migration were systematically different from those for rural to urban migration at 0.005. The logit model and methodology of testing are discussed in Gregory C. Chow, Econometrics (New York, 1983), pp. 255-263.

Additional analysis of rural to rural migration will be reported in subsequent work.

6. The value of $-2 \log \lambda$ shown at the bottom of the table, and in other tables of the paper, is a measure of the significance of the regression relationship. The term λ is the likelihood ratio and equals the value of the likelihood function obtained when all parameter values are set equal to zero divided by the value of the likelihood function obtained under the

maintained hypothesis. The variable $-2 \log \lambda$ has a chi-square distribution with as many degrees of freedom as parameter values set equal to zero, which is 13 in the case of Table 2.

Many migration studies have found that migration rates are nonlinear as a function of age. The chances of movement rise from low rates at ages in the teens, reach a peak in the mid-twenties, and then fall more or less regularily at the older ages. See, for example, Hope T. Eldridge and Dorothy Swain Thomas, Population Redistribution and Economic Growth, United States, 1870-1950, Vol. 3, Demographic Analyses and Interrelations (Philadelphia, 1964), pp. 132-138. Given this pattern, one could argue that a squared term in age should be included among the regressors. However, the the sample is composed overwhelmingly of household heads whose ages fell on the declining portion of the age-migration relationship. Only 3.5 percent of the heads were below age 25 in 1850. Moreover, age and age-squared are jointly insignificant if included in this equation and are usually insignificant in other equations involving age reported in the paper. The exception involves urban to rural migration in the North Central states; in that instance the chances of movement reached a minimum at age 37.3.

7. The definitions of occupational groups follow those outlined in appendix B of Stephan Thernstrom, The Other Bostonians. (Cambridge, 1973). Given the imprecision of occupational listings by the census and the debate over what constitutes appropriate groupings, the results give only a general impression of migration flows by occupational categories. In 1850 the white collar workers consisted primarily of clergyman (3.0%), clerks (5.5%), doctors and physicians (9.7%), grocers (2.5%), innkeepers (2.1%), lawyers and attorneys (7.2%), lumber merchants (2.1%), manufacturers (3.0%), merchants (22.4%), overseers (4.2%), teachers (3.4%), and traders (2.1%).

The blue collar workers were composed largely of blacksmiths (8.2%), bricklayers and masons (4.2%), butchers (2.3%), cabinet makers (3.3%), carpenters (18.6%), coopers (4.2%), millers (3.3%), shoemakers (10.1%), tailors (4.2%), wagon makers (3.6%), and wheelwrights (2.3%). Laborers (89.1%) dominated the unskilled.

8. Distances were measured from centroids of population in each county.

9. Of 124 households that resided in urban areas of the East (defined as east of the 90th meridian, which is a few miles east of St. Louis), none moved to rural areas of the West (defined as west of the 90th meridian). Changing the definition of region to the 88th or the 92nd meridian has no effect on the results.

10. In this discussion region is defined by place of residence in 1860. The regional comparisons should be viewed cautiously because methods of enumerating town and village populations may have varied. The published census for New England, for example, tended to report separately only the larger urban areas. The measure of rural to urban migration may therefore understate the actual extent of movement in the Northeast compared with other regions. Townships that had populations in excess of 10,000 residents were arbitrarily counted as urban areas. Even if all concentrations of population corresponding to towns and villages of size less than 10,000 were not distinguished from truly rural areas in the New England census, however, the measured extent of rural to urban migration by established households in the Northeast (9.2 percent) is remarkably small compared with the extent of urban growth, however defined, in the region.

Likelihood-ratio tests indicate that determinants of migration differed systematically across regions. The regression relationships were

significantly different at 0.05 (Northeast versus North Central), 0.20 (Northeast versus South), and 0.15 (North Central versus South).

11. Eldridge and Thomas, Population Redistribution, p. 210.

12. Unfortunately, there are insufficient observations to distinguish among country of birth for the foreign-born. Similarily, observations are lacking to investigate the behavior of blacks and the illiterate by region. However, if the regions are combined in a single analysis, the probability of migration to urban areas was systematically higher for blacks compared with whites. The finding of higher mobility for blacks reinforces the point on the mobility of this group made in the section on rural to rural migration.

13. These figures pertain to the Northeast, North Central, and South only. High rates of outmigration, which have been documented for specific urban areas in the United States, also characterized European cities in the 19th century. See Peter R. Knights, The Plain People of Boston, 1830-1860: A Study in City Growth (New York, 1971), pp. 103-104; Paul M. Hohenberg and Lynn Hollen Lees, The Making of Urban Europe, 1000-1950 (Cambridge, 1985), p. 255.

14. Likelihood-ratio tests indicate that determinants of urban to rural migration differed systematically by region. The regression relationships were significantly different at 0.10 (Northeast versus north Central), 0.025 (Northeast versus South), and 0.08 (North Central versus South). In addition, within each region the regression relationships determining rural to urban versus urban to rural migration were significantly different at 0.005.

15. The controversy is illustrated by the debate over the "egalitarian myth." See Robert E. Gallman, "Professor Pessen on the "Egalitarian Myth,'"

Social Science History 2(Win. 1978), pp. 194-207; Edward Pessen, "On a Recent Cliometric Attempt to Resurrect the Myth of Antebellum Egalitarianism," Social Science History 3 (Win. 1979), pp. 208-227. The debate extends beyond social and occupational mobility and incorporates the distribution of wealth. The matched sample of households includes information on wealth (measured by value of real estate) but my analysis of these data will be reported in another paper.

16. A critique of the debate over occupational classification and social mobility is available in Patrick M. Horan, "Occupational Mobility and Historical Social Structure," Social Science History 9 (Win. 1985), pp. 25-47.

17. Upward is defined as movement from unskilled to farmer, blue collar, or white collar; farmer to blue collar or white collar; and blue collar to white collar. The percentages are significantly different at 0.10.

18. This pattern has been observed in other countries. Young, single adults also comprised the majority of newcomers to European cities in the 19th century. However, there were instances of widespread movement of families to cities in Ireland and Germany. See Hohenberg and Lees, The Making of Modern Europe, pp. 255-56.

19. On fertility and fertility control in the North see Jenny Bourne Wahl, "New Results on the Decline in Household Fertility in the United States from 1750 to 1900," in Stanley L. Engerman and Robert E. Gallman, eds., Long-Term Factors in American Economic Growth (Chicago, 1986), pp. 391-437; Paul A. David and Warren C. Sanderson, "Ridimentary Contraceptive Methods and the American Transition to Marital Fertility Control, 1855-1915," in Stanley L. Engerman and Robert E. Gallman, eds., Long-Term Factors in American Economic Growth (Chicago, 1986), pp. 307-379; Jeremy Atack and Fred Bateman, To Their

Own Soil: Agriculture in the Antebellum North (Ames, Iowa, 1987), Chap. 4. On the South see Richard H. Steckel, "Antebellum Southern White Fertility: A Demographic and Economic Analysis," Journal of Economic History, 40 (June 1979), pp. 331-350.

20. On migration and illness see James H. Cassedy, Medicine and American Growth, 1800-1860 (Madison, 1986), Chap. 4.

21. Jeffrey G. Williamson and Peter H. Lindert, American Inequality: A Macroeconomic History (New York, 1980); Claudia Goldin and Kenneth Sokoloff, "Women, Children, and Industrialization in the Early Republic: Evidence from Manufacturing Censuses," Journal of Economic History (Dec. 1982), pp. 741-774; John James and Jonathan Skinner, "The Resolution of the Labor Scarcity Paradox," Journal of Economic History (Sept. 1985), pp. 513-540; Scott D. Grosse, "On the Alleged Antebellum Surge in Wage Differentials: A Critique of Williamson and Lindert," Journal of Economic History (June 1982), pp. 413-418; Robert A. Margo and Georgia C. Villaflor, "The Antebellum 'Surge' in Skill Differentials One More Time: New Evidence," National Bureau of Economic Research Working Paper No. 1758 (Cambridge, 1985).

22. Established households and unattached individuals do not exhaust the demographic classification of those who migrated to urban areas. Some men who moved from rural areas temporarily left their wife and children to find employment in the city.

23. Record linkage going forward from 1850 to 1860, though desirable, is an very difficult task (prohibitively expensive) for a substantial national sample (given present technology and data resources) because households would have to be sought in all possible locations. Backward linkage from 1860 to 1850 is feasible, however, by using information on the likely place of origin of the family contained in reports of places of birth of children.

Details of the collection procedure are discussed in Richard H. Steckel, "Census Matching and Migration: A Research Strategy," Mimeo (Columbus, 1987).

24. The statistical analysis of losses is discussed in Steckel, "Census Matching."