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Migration and Residential Location of Workers at Nuclear Power Plant Construction Sites

Forecasting Methodology

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16. ABSTRACT (200 words or less) The primary objective of this study was to improve the accuracy of socioeconomic impact assessments by providing an improved methodology for predicting the number of immigrating workers and their residential location patterns at future nuclear power plant construction projects. Procedures for estimating several other variables which have important implications with respect to socioeconomic impact assessment (i.e. relocation of dependents, intention to remain in the area, type of housing selected, marital status, and average family size) were also developed. The analysis was based on worker survey data from 28 surveys which were conducted at 13 nuclear power plant construction sites. These survey data were examined to identify patterns of variation in variables of interest across sites as well as across various worker groups. In addition, considerable secondary data reflecting various regional and project characteristics were gathered for each site. These data were used to estimate the effects of factors underlying the observed variation in craft-specific migrant proportions and the residential location patterns of immigrating workers across sites and surveys. The results of these analyses were then used as a basis for the specification of the forecasting procedures.					
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movers live relatively close to the construction site. In fact, we found that 45 to 85 percent of the movers live in the local area (within 15 miles of the site) compared to only 10 to 25 percent of the nonmovers. Movers who relocate their families typically live farther away from the site, as do the permanent movers. Most movers and almost all movers with families choose to live in single family houses and mobile homes.

The characteristics of the movers did not vary much from site to site. About 75 to 85 percent of the movers are married. The average family size of those movers who relocate their families is 3.25, and the average number of school-age children among movers is 0.8. The family income of movers generally exceeds \$20,000 (1978 dollars).

We found significant differences when we examined profile variables by various worker groups. Forty to 60 percent of nonconstruction workers are movers, while only 10 to 30 percent of construction workers are movers. The difference is primarily due to management workers--60 to 75 percent of those workers are movers. Nonconstruction movers (60 to 75 percent) are more likely to leave the area by the time the project is completed than construction movers (40 to 50 percent). However, despite the more temporary nature of their move, nonconstruction workers are more likely to relocate their families than are construction workers. There is no difference in the residential location patterns of construction and nonconstruction movers, although construction movers are more likely to live in mobile homes and nonconstruction movers are more likely to live in single family houses.

Among construction workers, some salient differences were observed between workers from different crafts. We found that the migrant proportions typically range from 15 to 45 percent among workers from scarce crafts, but range from 10 to 30 percent among workers from common crafts and only 5 to 10 percent among workers from abundant crafts. The movers among the scarce craft group are more likely to leave the area before or upon completion of the project and are less likely to relocate their families. However, the location and type of housing chosen by movers from scarce crafts is not very different from that of movers from other craft groups.

Finally, we did observe some evidence of distinct differences in profile variables with respect to region. Overall migrant proportions at

the southern sites are somewhat higher than those at the northern sites. Also, significantly higher proportions of movers relocate their families in the South than do movers in the North. Although there is no apparent regional difference in the residential location patterns of movers, there is a significant difference in the type of housing chosen by movers in the two regions. A much higher proportion of movers live in mobile homes, and to a lesser extent in single family houses, in the South than in the North. Similarly, lower proportions of movers live in apartments, hotels, motels, and rooming houses in the South than in the North.

The above discussion has been a general overview of the major findings of our profile analysis. A more detailed summary of specific findings of the analysis of each profile variable is presented below.

1. Migrant Proportions

The major findings of our profile analysis of migrant proportions are as follows:

- There is a large variation across sites in terms of overall migrant proportions and in migrant proportions among various worker groups. Typically, overall migrant proportions range from 15 to 35 percent.
- Migrant proportions are higher among nonconstruction workers (40 to 60 percent) than among construction workers (10 to 30 percent).
- Higher migrant proportions among nonconstruction workers are due to management workers (60 to 75 percent) and not to clerical workers (20 to 35 percent).
- Relative scarcity of labor explains a considerable amount of variation among construction crafts. Migrant proportions among workers from scarce crafts (15 to 45 percent) are higher than those among workers from common crafts (10 to 30 percent), which in turn are higher than migrant proportions among workers from abundant crafts (5 to 10 percent).
- A significant difference in migrant proportion by region among various worker groups is found only in the case of nonconstruction workers. This regional difference reflects the difference in the migrant proportions among clerical workers. Migrant proportions among clerical workers in the North (10 to 20 percent) are lower than those in the South (25 to 30 percent).

2. Intention to Remain in the Area

The major findings of our profile analysis of the movers' intentions to remain in the area are as follows:

- Temporary movers constitute a significant proportion of the movers at a site. Typically, 50 to 60 percent of all movers expect to leave the area before or upon the completion of the construction project.
- The proportion of movers who could be classified as temporary among nonconstruction workers (60 to 75 percent) is higher than that among construction workers (40 to 50 percent).
- Nonconstruction movers, despite the temporary nature of their employment, are less likely to maintain a permanent residence elsewhere than are construction movers. Thus, use of a permanent residence as an indication of intention to remain in the area is appropriate for construction workers but not for nonconstruction workers.

3. Relocation of Dependents

The major findings of our profile analysis of relocation of dependents are as follows:

- There is a large variation across sites in terms of the proportions of all movers with family present and in the proportions among various worker groups.
- Typically, overall proportions of movers with family present range from 50 to 70 percent. The overall proportions of movers with family present are higher among sites in the South than among sites in the North.
- Region explains a considerable amount of variation in the proportions of movers with family present. In all cases proportions for various worker groups were higher in the South than in the North.
- Proportions of movers with family present are higher among nonconstruction movers (in the North from 60 to 75 percent and in the South from 70 to 85 percent) than among construction movers (in the North 45 to 55 percent and in the South from 50 to 70 percent).
- In the North, proportions of movers with family present are lower among movers from scarce crafts (40 to 50 percent) than among movers from other crafts (50 to 55 percent). A similar difference between craft groups is not apparent among southern sites.
- Among construction movers, relocation of dependents is related to movers' intentions to remain in the area. Among nonconstruction movers, the intended length of stay is not related to the proportion of movers with family present.

4. Residential Location

The major findings of our profile analysis of residential location are as follows:

- The residential location patterns of movers and nonmovers are different and they both exhibit considerable variation across sites. The variation stems from differences in the numbers and sizes of communities in the regions surrounding the sites.
- Higher proportions of movers reside in communities closer to the site relative to the proportions of nonmovers residing in those communities. Typically, higher proportions of movers in relation to the proportion of nonmovers live in communities within 20 miles of the site and vice versa in communities beyond 20 miles from a site.
- In the North nonmovers typically live much closer to the site than in the South, but there is no such regional difference in the residential location patterns of movers.
- Even in the most rural sites 70 percent of the movers live within 25 miles of the site.
- The overall proportions of movers living in the local area (45 to 85 percent) is significantly greater than the proportions of nonmovers living in the local area (10 to 25 percent).
- The proportions of movers living in the local area are similar for all worker groups.
- The presence or absence of a family and movers' intentions to remain in the area influence residential location decisions.

5. Type of Housing

The major findings of our profile analysis of type of housing are as follows:

- There is considerable variation in the type of housing selected by movers across sites. Generally, 60 to 90 percent of movers live in single family houses or mobile homes.
- Typical ranges of the proportions of movers living in each of the four housing types are as follows: single family houses--30 to 45 percent; mobile homes--20 to 45 percent; apartments--10 to 20 percent; and all other types of housing--less than 10 percent.
- There are significant differences in the type of housing selected by construction and nonconstruction movers:

- Lower proportions of construction movers (25 to 40 percent) live in single family houses than nonconstruction movers (50 to 65 percent);
 - Higher proportions of construction movers live in mobile homes (35 to 55 percent) than nonconstruction movers (10 to 25 percent);
 - Somewhat lower proportions of construction movers (5 to 20 percent) live in apartments than nonconstruction movers (10 to 25 percent);
 - Higher proportions of construction movers (5 to 20 percent) live in other types of temporary housing than nonconstruction movers (less than 10 percent).
- There are significant regional differences in the type of housing selected by movers. Single family houses and mobile homes are more likely to be chosen (overall and by all worker groups) in the South than in the North. Correspondingly, apartments and other types of temporary housing are less likely to be chosen (overall and by all worker groups) in the South than in the North. Overall proportions living in different types of housing are:

-- Single family houses	North	35 to 40 percent
	South	40 to 50 percent
-- Mobile homes	North	About 20 percent
	South	35 to 50 percent
-- Apartments	North	25 to 35 percent
	South	10 to 20 percent
-- Other types of housing	North	10 to 15 percent
	South	0 to 5 percent
 - Presence or absence of a family is related to the type of housing selected by movers. Typically, higher proportions of movers with family present (45 to 65 percent) live in single family houses compared to movers without family present (10 to 20 percent). Few movers with family present live in hotels/motels, etc., but 10 to 25 percent of movers without family present live in such temporary quarters.

6. Demographic Characteristics of Movers

The major findings of our examination of the demographic characteristics of movers are as follows:

- Among construction movers, the proportion of movers who are married is higher in the South (85 percent) than in the North (75 percent). No regional difference, however, was apparent among the nonconstruction group.
- Average family size varied across worker groups. The average family size of construction movers (3.4) was somewhat higher than that of nonconstruction movers (3.1).

- Average number of school-age children also varied across worker groups. The average number of school-age children was .85 among construction movers, compared with only .6 among nonconstruction movers.
- The median family income of all movers was approximately \$21,000 a year (1978 dollars), with the average among the nonconstruction (\$21,700) group being higher than among the construction group (\$20,500). Similarly, the median family income among the scarce movers (\$21,000) was higher than than among the common and abundant mover group (\$19,300).

IMPLICATIONS FOR FORECASTING

The results of this profile analysis have demonstrated that there is a large variation in key variables (i.e., migrant proportions, relocation of dependents, residential location, type of housing selected) across sites and surveys. The results of the analysis have also shown systematic variation in these key variables across worker groups. These differences across various worker groups, however, are not surprising in light of the differences among worker groups with respect to the local availability of workers in the area immediately surrounding the construction site, the degree of specialization required in tasks performed, and the nature of labor requirements (potential for employment) at the site.

Consider, for example, the observed differences in key variables among construction crafts grouped by relative scarcity of labor. The lowest migrant proportions were observed among the abundant craft group (laborers and teamsters). These crafts do not require extensive prior training and their skills are not specific to any particular type of construction project. As a result, workers from these crafts are readily available locally and, as such, can be easily recruited from the local labor pool. There are, of course, other more specialized construction crafts, such as those represented in the scarce craft group, and the local labor supply is less likely to be able to provide a sufficient number of such workers. Therefore, it is not surprising to observe greater numbers of movers among crafts which are relatively scarce.

Differences in other profile variables, such as intention to remain in the area, relocation of dependents, and type of housing selected, also lie in differences in employment opportunities for various worker groups. The construction industry is characterized by a high labor turnover. Employment for construction workers is seldom permanent. Rather,