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A Study of Wage Contour Determinants For Northern Minnesota

ROBERT D. LEY* and WILLIAM A. WINES**

ABSTRACT — This paper reports the findings of a study designed to profile wages and employment in northern Minnesota. Because of differences in the structure of the local economy and differences in the composition of the labor force, we hypothesized that studies done for other regions as well as national studies might produce misleading information if applied to northern Minnesota. The study is based on responses to 1400 mail surveys distributed in 1983 in four cities in northern Minnesota: Bemidji, Brainerd, Fergus Falls, and Grand Rapids. We found some surprising differences between the workforces in the four cities. Our overall impression was of an older, stable workforce characterized by long-term attachment to geographical location and occupation. The workforce is heavily concentrated in the service sector and has a smaller number of workers in manufacturing than the national figures would predict. Earnings in the region are somewhat below the nation's norm. Finally, the region's workforce is traditional in the sense that it reflects historical male/female wage differentials and tends toward occupational segregation by sex.

Introduction

A number of national data banks on wages and employment are available for researchers and are frequently used. It is not clear, however, whether the national figures, mostly from the census, accurately describe the situation in non-metropolitan northern Minnesota. For instance, it is widely known that in the 1970s women earned approximately 59 cents for every dollar earned by men. Would this ratio hold true for northern Minnesota? A number of possibilities could be hypothesized depending upon whether we started from the somewhat romantic premise of the pioneer woman and farm wife as a full partner or from the polar view of the region as being sufficiently removed geographically and politically from the influence of modern feminism so as to be more repressive in wages for women. Similar conflicting theories could be advanced for other wage issues as well. We decided to survey wages in northern Minnesota to acquire the data needed to answer such questions.

To that end, this study develops a wage contour for northern Minnesota.† Because of the distinctive structure of the region's economy (i.e., the predominance of primary production and the absence of a major urban area) and its demographic patterns, we hypothesized that its wage structure might differ significantly from the national pattern. If it does, national wage contours, or even statewide wage patterns, would be inaccurate for predicting wages in northern Minnesota. For some problems, such as identifying the types of industry that northern Minnesota is capable of attracting and maintaining, identification of anomalies in the regional wage contour could be particularly important.

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Wage and earnings data for the region are collected and reported elsewhere, for example, in the Minnesota Department of Economic Security's monthly *Review of Labor and Economic Conditions* (1). These data, however, report earnings exclusively by industry. The present study shifts the focus to earnings in particular occupations or families of related occupations. The industrial categories that remain were used to permit responses by workers whose specific occupations are not named. For some of our purposes, such as comparing earnings in male and female dominated industries and assessing the region's comparative advantage based on relative costs, occupational earnings seemed more appropriate than earnings by industry. Other advantages of using consolidated categories include keeping the survey instrument under four pages to encourage completion by recipients and keeping weight and mailing costs down.

Materials and Methods

Sample

The study is based on responses to 1400 mail surveys distributed in four cities in northern Minnesota: Bemidji, Brainerd, Fergus Falls, and Grand Rapids. Half the surveys were sent to males, and half to females. While this facilitates comparisons of earnings by gender, it also means that females are a larger fraction of our sample than they are of the region's labor force. This must be considered in interpreting the

†To our knowledge, no other studies of wage determinants have been undertaken in north central Minnesota. The closest related study is an unpublished study done by student interns under the direction of Professor Ley. It was concerned only with factors affecting labor supply and not with variables, like experience, that influence earnings on the demand side. Moreover, it was geographically restricted, focusing only on the Bemidji area.

results. Clearly, however, the sample composition will not affect the results for individual occupational categories or for males and females considered separately.

The cities included in the survey are the population centers in north central Minnesota. In addition to having relatively large populations and labor forces, these rural commercial centers presumably have a more diverse labor force than do rural out-state areas generally. Additionally, there are differences among these towns that might affect their individual earnings contours. Grand Rapids, for example, is the site of a single, large unionized employer whose wage structure might be expected to affect the earnings of other local workers. Similarly, Bemidji has an unusually large share of public sector employment, suggesting the level of government wages in Bemidji might influence overall earnings in that city. Finally, the variations among communities should help make the overall results more representative of the region as a whole.

The names of individuals surveyed were selected at random from the city directories of the communities involved (2). Individuals not listing occupations were not included in the sample. However, the sample was not limited entirely to the employed since some individuals had left the workforce between the time of the publication of the directories and the date of the survey. In Bemidji and Brainerd, we selected the names of 250 males and 250 females. In Fergus Falls and Grand Rapids, we selected 100 individuals of each sex. The decision to include equal numbers of males and females reflects our own interest in exploring earnings differences by gender, rather than the structures of the labor force. Differences in sample size by community were due largely to differences in the format of city directories, which made it easier to identify employed individuals in Bemidji and Brainerd than in other cities. The cities with the larger samples also have larger populations.

Survey instrument

As is often the case with a mail survey, the design of the instrument represents a compromise between a desire for useful information and concern with the response rate. It is fairly well established that response rates drop as questionnaire length increases, and with that in mind, we limited ours to two 8½ x 11 inch pages printed on both sides.

The first two questions on the survey asked the respondent's sex and asked whether or not he or she were employed. Question 3 asked the respondent to identify both a primary and a secondary occupation if appropriate. Here, 48 options were available, plus an "other" category. Of these, 38 referred to specific occupations or families of occupations. The other 10 served as catch-alls, organizing responses by industries rather than by occupation (e.g., durable goods manufacturing). The specific occupations selected were based on the structure of the region's economy and on our perception of which occupations were likely to be dominated by males or females.

The possibility that a spouse's employment status might influence the respondent's behavior led us to ask that the spouse's occupation, where appropriate, be identified with the respondent's occupation in question 3. Additionally, respondents were asked to record their spouse's earnings in one of nine categories when answering question 21. Finally, marital status was reported under question 20, due to its possible influence on behavior independent of the occupation and earnings of the spouse.

Question 4 asked the length of the individual's primary employment, a proxy for experience. An additional indicator

of workers' job-specific productivity was incorporated in questions 13 and 14, in which the respondents were asked to identify physical handicaps. A final possible indicator of worker "quality" is included in question 12, wherein respondents were asked to mark one of 12 age categories. These questions enable us to explore the possibility that the market's evaluation of workers' contributions is influenced by factors including age, experience, and health.

Under question 5, the respondent was asked to indicate average weekly work hours. Combined with annual earnings data, the response allows us to approximate an hourly wage. Average hours are of interest in their own right; moreover, the length of the work week is a feature that might influence the attractiveness of alternative employments. Information concerning the variability of the work week was not requested.

The number of layoffs experienced in the primary occupation during the last two years was requested in question 6. The risk of layoff, hence the stability of income, is one of the features workers may consider in evaluating alternative employments. Occupations offering steadier, or at least more predictable employment, might be preferred by workers to occupations where employment is less stable. Thus, employment volatility, measured here by layoffs, might be one influence on the wages a firm must pay to attract labor.

A number of questions were included to ascertain workers' preferences concerning other aspects of their lives that might affect their employment behavior. In addition to a direct inquiry concerning their level of job satisfaction (question 7), the strength of their commitment to the region was surveyed by asking how long they have resided in northern Minnesota (question 18) and whether or not they expect to remain there (question 19).

In part a result of our interest in differences in the behavior of male and female workers, we included several questions to determine respondents' home responsibilities. Numbers of dependent children and other dependents were surveyed (question 9 and 10). Additionally, commuting distances were recorded (question 11). Presumably, the cost of commuting is a disincentive to all workers. The importance of physical proximity of the home to the work place might be expected to be greater as the respondent's home responsibilities increase.

Two questions were concerned with the individual's commitment to the labor force. Question 16 asked whether the individual plans to remain in the labor force for at least five years. Question 17 asked whether the respondent intends to continue in the same principal occupation.

Finally, two questions (numbers 8 and 15) concern earnings. In the former, individuals were asked to place current earnings in one of nine categories. In the latter, they reported the maximum future earnings anticipated in their primary occupation. Here, the value of the responses for some statistical purposes is diminished by our use of income categories instead of specific individual earnings. Many people are reluctant to disclose earnings, and some are uncertain as to exactly what the previous year's earnings were. Such reluctance and uncertainty would have lowered our response rate. Rather than run that risk, we decided to use income categories and accept the trade-off.*

Comparisons with national data

To compare the characteristics of workers in the region with the national labor force, we used data from the 1980 census

*Professor Ley's experience with mail surveys in northern Minnesota had increased the authors' concern with response rates (3).

(4). Here, we intend only to present comparable statistics without attempting to fully analyze the significance and origins of the differences. We summarize these differences briefly in the conclusion, providing a point of departure for further analysis.

Results and Discussion

A total of 468 responses were received, representing 33% of those surveyed, a respectable rate for a mail survey (5). Response rates by cities were Bemidji, 23%; Brainerd, 38%; Grand Rapids, 52%; and Fergus Falls, 23%. Although equal numbers of males and females were represented in our sample, 251 (54%) of the 462 respondents who indicated gender were females, and 211 (46%) of the respondents, were males. Since males are a majority of the labor force nationally and within the region, females are over represented in our data. This will distort our aggregate results as a measure of the region's labor force but will make it more useful for other purposes (i.e., comparing the relative position and characteristics of female workers). The degree of distortion depends on (a) the degree to which the sample fails to reflect the make-up of the labor force; and (b) the extent of differences in the characteristics of males and females. The percentages of males and females in the sample would come closer to the regional norms if they were reversed. In presenting the results, we will first present the aggregate response to each question, then comment briefly on differences in response by city and gender.

Of our respondents, 92.1% reported working outside the home during the first quarter of 1984. Of those who did not, some were unemployed and seeking employment and some had withdrawn from the labor force. Overall, the national labor force was 62% of the adult population in 1979. Our results, therefore, are more representative of members of the regional labor force than of all adults.

Our sample's labor force was heavily concentrated in the service sector. Sales workers accounted for 7% of the responses, clerical workers (including bookkeepers and secretaries) for 19%, teachers for 11%, and other service workers (including health services) for 11%. Additionally, some of the managers, the self-employed, and the 16.5% who placed themselves in the other category, are undoubtedly service workers. Employment in manufacturing was notably absent; only 1% of the respondents identified themselves as manufacturing workers or operatives. Again, some manufacturing employment is covered under other headings; engineers (3% of the total responses) and some managers are presumably employed in the manufacturing sector.

Not surprisingly, manufacturing occupations are somewhat more important nationally than the same headings are in north central Minnesota. Nationally, 11.7% of the labor force are operators, fabricators, and laborers, whereas no more than 8.0% of the regional labor force could be placed under that heading. In contrast, Minnesota has a slightly larger share of its labor force in the managerial and professional category (25.0% vs. 22.7%) and in the clerical category (18.4% vs. 17.3%). These differences presumably reflect the region's distance from markets. Also, the predominance of the service sector and the relatively small percentage of manufacturing employment may reflect, to some degree, the traditional employment patterns of females, who are over represented in our sample.

Clustering by gender is present in certain occupations. No males, for example, are secretaries or clerical workers other

than bookkeepers; and no females are mechanics, machinists, or farmers. In some other occupations where both sexes are represented, there is a tendency toward predominance by one gender; two-thirds of the teachers among our respondents were females, and 25 out of 35 managers were males.

The pattern of gender clustering within the region is comparable to that observed nationally, with some small differences. For example, 31.2% of female workers nationally are in clerical and administrative support occupations, compared with 28.3% of our sample. Similarly, females are a small proportion of managers both nationally (7.4%) and within the region (4.0%). It is somewhat surprising that our sample produced a percentage of female managers that is only slightly over half the national rate. We were unable to compare employment by gender in specific occupations because the census data is largely limited to broader occupational headings. With some exceptions, similar patterns emerge nationally and within the region. We did not attempt to ascertain whether or not differences between the national and regional patterns are statistically significant.

Over one-fifth of our respondents, 22.4%, reported having some secondary occupation. Secretarial work and bookkeeping were the most common secondary employments at 10% and 7%, respectively. All but one person claiming these two secondary employments (one male was a bookkeeper) were female. The self-employed accounted for 6% of those with secondary occupations, while 14% having a secondary occupation placed themselves in the "other" category.

Workers generally appear to be experienced, 78% of the total having been in their primary employment for more than six years. Males are somewhat more experienced by this measure: 86% of them have been employed for more than six years in their primary occupation compared with 71% of females. Females are also somewhat more likely to be new entrants, with 2% having less than six months' experience. Only 0.4% of males reported less than six months' experience. There are also some differences in experience by city. Grand Rapids had the largest percentage of workers with more than six years' experience (87%) and none with less than two years. Fergus Falls lay at the other extreme: only 71% of the respondents had more than six years' experience, and 2% had worked in their primary occupation less than six months.

Available census data do not report years in workers' primary occupation. We may infer, however, that workers in northern Minnesota are somewhat more experienced than the national norm. For example, in 1980 approximately 25% of the nation's labor force was less than 25 years old. Particularly after allowing for some occupational shifts on the part of younger workers, it seems likely that less than three-fourths of the nation's workers have been in their primary employment for more than six years. If we assume that those under 25 have less than six years' experience and if that group is one quarter of the labor force, it follows that no more than three-fourths of the labor force may have more than six years' experience. The region's labor force is somewhat older than the national average; this suggests that it is also somewhat more experienced on the average.

Workers in the area appear to work more than the standard 40-hour week on the average. Fifty-one percent reported averaging 40 to 50 hours per week, and 8% told us they worked more than 50 hours per week. Men tend to work longer hours than women; 77% of males worked more than 40 hours per week, while only 45% of females did. Similarly, 8% of female workers worked fewer than 20 hours while only 3% of the males did. By city, Bemidji had the most workers working

more than 40 hours (68%) while Fergus Falls had the least (45%). Fergus Falls also had the smallest share of workers working less than 20 hours (2%), and Bemidji the largest share (8%).

National data show that 89% of householders usually worked 35 or more hours per week. However, since householders comprised only 60% of the labor force and may be expected to be more committed to the labor force than non-householders, this figure probably overstates the share of full-time workers in the nation's workforce. Nationally, as within the region, there is a tendency for males to work longer hours than females. Thus, 93% of married male householders who worked did so for more than 35 hours a week, while 75% of the married female householders who worked did so full time. For female householders without husbands, the comparable figure is 79%.

A large majority of respondents have not had employment interrupted by layoffs; 86% reported no layoffs within the past five years and only 5% had been laid off two or more times. Females were slightly less subject to layoffs than males, 87% of them never having been laid off and only 4% having experienced two or more layoffs. The corresponding percentages for males are 85% and 6%, respectively. Respondents who are currently employed outside the home are slightly more likely to have experienced no layoffs than workers who currently do not work. This suggests that some respondents who are not working now are discouraged workers who have withdrawn from the labor force due to a perceived lack of opportunities.

There were large differences in the incidence of layoffs in different cities. In Bemidji, 33% of the respondents had been laid off at least once in the past six years, while only 8% of the Brainerd and Grand Rapids and 15% of the Fergus Falls respondents had been laid off.

It appears that workers in the region may enjoy greater job security than do workers nationally. Long-term data for the U.S. is not available, but in 1979, 18.5% of the nation's labor force experienced some unemployment. These figures should be viewed with caution, however, since regional data concern only layoffs, while the national data considers all unemployment — people entering the labor force for the first time and people leaving their jobs, as well as layoffs by employers. We note also that females were subject to more unemployment nationally (19.5% of the total female workforce experienced some unemployment the preceding year) than were males (17.8% of whom experienced some unemployment).

Workers in northern Minnesota generally appear to be satisfied with their jobs; 80% indicated that they are at least generally satisfied and only 14% indicated some level of dissatisfaction. Only 5% are sufficiently dissatisfied to indicate that they would like a change in employment. (National census data on job satisfaction are not available.) The degree of job satisfaction does not appear to be affected by gender; the percentage of males and females reporting being at least generally satisfied is the same. The only difference here is that females are slightly more likely (7% vs. 4%) than males to be sufficiently dissatisfied to seek alternative employment. Differences in job satisfaction by city are not pronounced. Fergus Falls and Bemidji both report 82% of the respondents satisfied, compared with 79% in Grand Rapids and 78% in Brainerd. Brainerd had the largest proportion of dissatisfied workers (17%); Fergus Falls the least (9%).

In terms of earnings, the largest number of respondents fall in the \$20,000 to \$29,000 range (27% of the total), while 52% have lower incomes, and 18% have incomes in excess of \$30,000. There are large differences in earnings by occupation. Significant differences in earnings by gender were consistent with earlier observations that females are more likely to be part-time workers and also with the tendency for males and females to be clustered in different occupations (6). Thus, the modal income category for females was the \$5,000 to \$9,999 range; and the mode for males was the \$20,000 to \$29,999 range. Moreover, 32% of male respondents earned in excess of \$30,000 while only 3% of female respondents did. At the other extreme, 34% of females earned less than \$10,000 compared with only 5% of males.

Although the \$20,000 to \$29,999 range was the mode in three cities — Bemidji, Brainerd, and Grand Rapids — there also were differences in income patterns among the cities surveyed. Incomes were lowest in Fergus Falls, where 68% of the respondents reported incomes of less than \$20,000, and 23% of the responses were in the \$5,000 to \$9,999 range. Incomes were least uneven in Grand Rapids. The largest group there, 42% of the total, was in the \$20,000 to \$29,999 range, while the percentage below \$20,000 was the lowest for all cities (42%), as was the share with incomes in excess of \$30,000 (13%).

Although north central Minnesota contains some of the state's poorest counties, we could not determine whether the region's poverty is the result of wages being more depressed locally than nationally. The census reports that in 1979, the modal income range for males was \$10,000 to \$24,999 and the range for females, under \$4,000. The national median income for all males was \$12,192, more than twice the median for females. Allowing for the rapid inflation of the early 1980s, these figures are not out of line with those in the region. If poverty is greater in north central Minnesota, it would appear to be the result of higher unemployment and a lower labor force participation rate than to lower earnings *per se*.

A majority of respondents had children of high school age or younger at home. The presence of children appears to influence the likelihood of women entering the labor force. While only 39% of males reported no dependent children in their home, 50% of female workers had no minor children at home. The presence of other adult dependents also appears to have a larger impact on the participation of women; 34% of male respondents reported the absence of other dependents while 78% of females reported no other dependents. Directly comparable national data are not available. We note, however, that in the nation, 48.5% of all families have no children at home. National data on other dependents is not available. Nor do we have information concerning the effect of the presence of children on the nationwide labor force participation by males and females.

Northern Minnesotans do not commute long distances. Fifty-seven percent of respondents reported traveling less than 4 miles to work and only 7% travel more than 20. Females travel shorter distances to work than do males; 64% of them reside within 4 miles of their work place, and 43% within 2 miles. Only 4% of females commute more than 20 miles. Among male workers, 11% commute more than 20 miles and 48% reside within 4 miles of their jobs. Commuting patterns are generally similar for all four cities. Fergus Falls respondents travel somewhat less; 68% of them being within 4 miles of

work. At 13%, Brainerd had the largest share of respondents who travel more than 20 miles.

Regional residents appear to commute less than the national norm. Only one-fifth of the nation's workforce commutes less than 10 minutes per day, with a mean commuting time of 21.5 minutes. Even at the relatively slow speeds of urban mass transit, it appears that the typical worker elsewhere works farther from his or her home. Census data on differences in commuting patterns by gender are not available.

The region's workforce is somewhat older than that of the nation's. Fourteen percent were less than 25 years old and 45% were between 26 and 40. The female labor force is more youthful, with 20% less than 25 versus 9% for males. Forty-one percent of females were between 26 and 40; 50% of males fell in the same age category. Workers over age 55 comprised 18% of the total, the differences between males and females being fractional. Again, different cities displayed different age structures. Fergus Falls had the largest percentage of workers under 20 (22%) and the smallest share of workers between 26 and 40 (41%); while Grand Rapids had a relatively high proportion of young workers (20%), it also had the largest share of workers between 26 and 40 (53%).

By way of comparison, 8% of the nation's labor force is under age 20 and an additional 15% between 20 and 24 years old. Fourteen percent of the national labor force is 55 or older. Thus, the nation's labor force is somewhat more youthful than the region's. In both cases, female workers as a group are somewhat younger than males.

Nine percent of the respondents indicated that they have some form of handicap. Results do not differ notably by gender or location. It should be noted that respondents defined themselves as handicapped or not. No restrictions or guidance was laid out in the survey.

Respondents are somewhat optimistic concerning their future earnings. The largest share, 27%, expect to be in the \$20,000 to \$29,999 bracket in five years and 34% expect to earn more than \$30,000. Currently, 18% earn more than \$30,000. While both females and males share in this optimism, differences in incomes by gender are expected to persist. For instance, 11% of females expect to earn more than \$30,000 in five years, compared with the 3% who do so now. For males, the corresponding figures are 60% and 32%. At the other end of the spectrum, the number of females earning less than \$10,000 is expected to decline from 34% to 18%, while the share of males in that category is expected to fall from 5% to 4%. While we lack comparable national data, our respondents' optimism with respect to future earnings is somewhat surprising since a relatively large proportion of them are already in their peak earning years. Some lingering inflationary expectations might account for some of this result.

Workers responding to the survey appear committed both to the workforce and to their primary occupation. Eighty-seven percent of our respondents report that they expect to be in the workforce in five years, and 91% report that they expect to be in the same occupation. It is obviously inconsistent that more people expect to remain in their occupations than expect to remain in the workforce. One possible explanation is that some who report they do not expect to be in the workforce are voicing an aspiration they are not sure they can achieve. Females were not appreciably less committed to the workforce than males: 86% of them expected to remain in the workforce compared with 87% for males. Similarly, 91% of males expected to be in the same occupation, while 90% of females did. The various cities showed similar patterns in their responses to these questions, differences being fractional

(comparable census data is unavailable).

In addition to commitment to working in their primary occupation, respondents also displayed a commitment to northern Minnesota. They have typically lived in the area for a considerable period of time and expect to remain there in the future. Ninety-three percent of the respondents indicated that they had been in the area more than six years and reported that they expect to remain there for at least another five years. Ninety-three percent of both male and female respondents reported being long-term (i.e., more than six years) residents of the area. Ninety-three percent of females also expect to remain there for another five years; 94% of males do.

By city, Bemidji has the largest percentage of long-term residents (96%) as well as the smallest share of those who expect to remain (90%). Brainerd and Grand Rapids have the smallest shares of long-term residents, with 91%, while Fergus Falls and Brainerd both have the largest portion (94%) who expect to remain in the area.

Although we do not have census data that directly measure commitment to the current area of residence, information on length of residence may provide some insight. We note, for example, that 21% of the nation's population in 1980 did not reside in the same county as in 1975 and that 11.5% had changed states. This suggests that workers within the region are significantly less mobile than the nation's population as a whole. One suspects that were the national data limited to just the labor force, there would be even greater disparity.

The area's labor force is typically married, with 78% of the respondents currently married and 11% single. Males are decidedly more likely to be married than females (91% vs. 65%), while females are more likely to be divorced, separated, or widowed (18% vs. 4%). These differences are probably the result of surveying only individuals who reported employment outside the home in the city directory. Not surprisingly, census data show the incidence of both marriage and divorce increasing with age. It appears that marital patterns within the region are broadly similar to national norms.

Somewhat surprisingly, there were notable differences in marital status by city. Grand Rapids had the lowest share of married people (61%) and the largest share of divorced, separated, or widowed people (21%). By contrast, in Fergus Falls 90% of respondents were married and 2% were divorced, separated, or widowed. Grand Rapids also had the largest share of single people (17%).

The incomes reported for spouses within the region tend to be below the incomes reported by respondents. This suggests that a substantial proportion of spouses were not employed outside the home, while in excess of 90% of respondents were. Thus, 28% of married respondents reported that their spouses earn less than \$2,500, and 48% reported that their spouses earn less than \$10,000. At the other end of the scale, 18% of our respondents earn in excess of \$30,000, while only 8% of those who are married reported spouses with incomes in that range. The implication is that spouses' earnings have a negative impact on individual participation in the workforce.

Spouses' earnings by gender are consistent with a measured lower participation rate for females and with the lower earning for females noted earlier. Sixteen percent of married females report spouses with earnings in excess of \$30,000 while only 2% of males report spouses with earnings in that range. Similarly, 75% of married males have wives earning less than \$10,000 while only 18% of the female respondents had husbands with comparable earnings. The earnings of spouses do differ somewhat by city, and the pattern is consistent with that described above for respondents' own earnings.

