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SELECTED LABOR MARKET INDICATORS AND THE INTRODUCTION
OF A LARGE GENERAL MOTORS ASSEMBLY PLANT
INTO THE OKLAHOMA CITY SMSA

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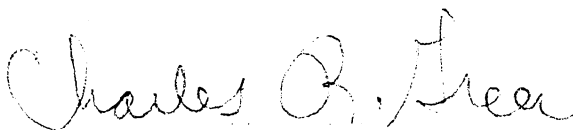
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Scope and Method of Study: This study explored the relationship between the opening of the General Motors plant in Oklahoma City and selected labor market indicators such as turnover, changes in employment levels between industries, changes in wages, and changes in rates of unionization. Data obtained from Oklahoma Labor Market was used in four stepwise regression equations to explore their relationship with the opening of the General Motors plant. A Delphi study was utilized to predict changes in unionization, real wages and scarcity of labor over the next five years. Five individuals representing unions, management, and a manpower agency participated in the three rounds of the Delphi procedure.

Findings and Conclusions: The study found a significant negative relationship between Oklahoma City total manufacturing quits and the Oklahoma City unemployment rate. Also, a positive relationship was found to exist between the opening of the General Motors plant and an increase in turnover for manufacturing and non-manufacturing industries in Oklahoma City. A negative relationship was found between the opening of the General Motors plant and the Oklahoma City unemployment rate. The Delphi study predicted a shortage of skilled labor such as that required by the General Motors plant as well as an increase in real wages and unionization over the next five years.

ADVISER'S APPROVAL

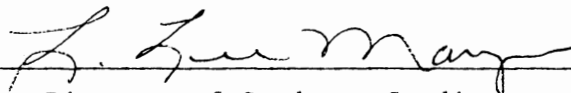


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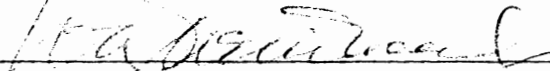
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INTRODUCTION

Oklahoma City is geographically located in the Sun Belt near the traditional markets of the Midwest and the growing markets of the Southwest. The Oklahoma Employment Securities Commission's December 1978 figures show that Oklahoma City has a population of 383,100 and the five-county metropolitan area consisting of Canadian, Cleveland, McClain, Pottawatomie, and Oklahoma Counties has a population of 799,800. (Oklahoma City Chamber of Commerce, 1980). Oklahoma City is the capital of Oklahoma as well as being in the center of oil country. Unemployment rates have typically been lower than in many parts of the country due to the activity of the oil industry. Because of the available energy resources and the ease of transportation from a geographical location in the center of the United States, increasing amounts of new industry have been moving into the region.

One of the new industrial establishments is a General Motors plant. On March 31, 1977, General Motors Vice President Charles Katko announced that Oklahoma City would be the location of its newest assembly plant. The 2,956,000 square foot plant was expected to employ 5,000 workers and assemble a total of 6,000 Chevrolet Citation and Pontiac Phoenix automobiles per week. Current General Motors management and technical staffs from the other nineteen plants in the assembly division were to make up the nucleus of personnel with the remainder of personnel coming from Oklahoma City and the surrounding areas (Bayless, 1977). The General Motors plant was expected to have other effects on Oklahoma City

in addition to direct employment effects. Market analysts in Oklahoma City estimated that for every position at the General Motors plant, two additional jobs would be created by suppliers of goods and services (Bayless, 1977). Officials stated that the plant would stimulate population growth in the Oklahoma City area to approximately one million by the end of the decade (Bayless, 1977).

Production at the new plant began in April 1979 with one shift of 2,700 workers and a payroll of approximately \$65. million (Bayless, 1977). Thirty-five thousand applications for employment were accepted before interviewing was halted. General Motor's information office, Carol Williams, stated that most of these people were employed elsewhere and were seeking better jobs (Fleming, 1979). The second shift was added November 5 , 1979 bringing the total to 5,386 workers with a payroll of approximately \$120. million annually ("FM Plant Has Milestone," 1979). All but 900 of the employees were reported to be Oklahomans with about 30 percent of the employees being women (Fleming, 1979). James R. Peters, the plant manager, stated that spending for payroll and goods boosted the local Oklahoma City economy by over \$74.5 million during 1979 (GM Plant Has Milestone," 1979). In 1977, the average hourly rate for General Motors production workers was \$7.36 per hour (Reid, 1977). In 1979, the wage was reported to be \$8. per hour as compared to the \$4. an hour that workers could get elsewhere ("GM Settles," 1979).

Another facet of General Motor's arrival into Oklahoma City was the unionization of the General Motors plant. The United Auto Workers were already the recognized bargaining agent for all General Motors plants with the exception of Clinton, Mississippi; Shreveport, Louisiana; and Fitzgerald, Georgia (Reid, 1977). The November 1976, General Motors

collective bargaining agreement contained a neutrality clause where General Motors agreed not to interfere with the United Auto Worker's organization efforts at General Motors' fourteen Sun Belt plants. In return, the union agreed not to conduct itself in a manner that would "demean" the corporation or its executives. In the November 1979 contract, General Motors agreed to guarantee workers in the North the right to apply for General Motors jobs in the South and to announce that it "has no objection to the United Auto Workers becoming the bargaining representative of the employees in new General Motors Plants" ("GM Settles," 1979). Even before this new policy, General Motors had 350 UAW applicants at Oklahoma City. Carlton Horner, a UAW organizer estimated that 500 UAW members might end up working at the new Oklahoma City plant. He commented prior to his attempts to organize, "there will be people who have been UAW members for years working at this plant who will speak up for the union" ("Why GM Abandoned its 'Southern Strategy'," 1978). Possibly due to the reasons he cited, the representational election was held in August 1979 and the UAW won by a vote of 1,479 to 658 ("UAW to Represent Workers of New GM Plant," 1979).

Newspaper accounts such as the Daily Oklahoman's "Work to Start This Month on GM's New City Plant" (April 1, 1977) and The Journal Record's "GM Local Purchases to Hit \$25 Million" (November 1979) give only glowing reports of General Motors' input into economy of Oklahoma City. The purpose of this study is to explore the effects of the General Motors plant on the labor market of Oklahoma City, and to investigate any association between the opening of the General Motors plant and changes in selected manpower indicators. These indicators include (1) a scarcity of certain types of labor (2) changes in wage rates (3) the

reallocation of labor between industries (4) changes in participation rates (5) labor turnover rates between and within industries, and (6) any association with a change in number of union representation elections as well as any change in the number of elections won by the union.

REVIEW OF THE LITERATURE

This chapter reviews the literature pertaining to each of the labor market indicators treated in the present analysis. The review begins with the literature on turnover and mobility.

Literature On Labor Turnover and Mobility

Most of the literature dealing with turnover concerns the turnover due to particular facets of the organization and to personal characteristics of the employee. Brayfield and Crocket (1955), Herzberg et. al. (1957), and Vroom (1964) all reviewed vast amounts of literature associated with turnover and absenteeism. All found strong positive relationships between employee dissatisfaction and turnover. Schuh (1967) reviewed fifty-three studies testing the predictability of turnover as judged by intelligence tests, aptitude tests, interest inventories, personality tests, biographical data, and job satisfaction inventories. Of the twenty-one studies he reviewed which used biographical data as a predictor of length of time on a job, only two failed to find a positive relationship. Kerr (1947) found a significant positive relationship between the average length of time employees remained on previous positions and their expressed job satisfaction with those positions. Porter and Steers (1973) attempted to review literature which had not been already evaluated in the studies previously listed. Porter and Steers divided the job satisfaction studies into the categories

of organization-side factors (pay and promotion, organizations size), immediate work environment factors (supervisory style, work unit size, peer group interaction), and personal factors (length of service, similarity of the job with vocational interest, personality characteristics, family size and responsibilities).

The literature which has reviewed pay and promotion, (for example, Friedlander and Walton, 1964; Hulin, 1968; Knowles, 1964; Patchen, 1960; Ronan, 1967; Saleh, Lee, and Prien, 1965) makes it clear that an employee does not leave the firm solely due to the need or desire for extra income or additional promotions. The perceived inequity of present pay and status significantly influences decisions to stay or leave. Concerning the size of the organization, Ingham (1970) found that turnover rates appear to be constant among organizations of varying sizes. This was the only study reported that empirically linked organizational size (in contrast to sub-unit size) to turnover. Kerr et. al. (1951), Indik and Seashore (1961), and Argyle et. al. (1958) found that the size of the work unit is positively related to turnover of blue-collar workers. Evidence concerning managerial or clerical personnel was not sufficient, however, to draw conclusions.

Studies have found a strong negative relationship between older employees and turnover (Farris, 1971; Fleishman and Berniger, 1960; Ley, 1966) as well as a negative relationship between longer length of service on the job and turnover (Fleishman and Berniger, 1960; Robinson, 1972). Porter and Steers (1973) have also reported positive relationships between turnover and personality characteristics such as high degrees of anxiety, aggression, independence, self-confidence, and ambition. In studies linking supervisory style to turnover, consideration has been

found to have a curvilinear relationship. Fleishman (1968) has found that higher consideration was associated with lower turnover up to a point. After this point is reached, little relationship has been found between consideration and turnover.

Porter and Steers (1973) found that peer group interaction can be both positively and negatively related to turnover depending on the study. This may be due to the fact that some peer groups offer support and encouragement while others cause friction between other employees. In studies of job content factors, a strong positive relationship between turnover and repetitiveness and with lack of autonomy or responsibility has been the general consensus. LaRocco, Pugh, and Gunderson (1977) investigated the turnover of Navy personnel and found that pre-service characteristics (such as demography and social background) as well as in-service experiences (such as service history, satisfaction, and performance) were the most important indicators of turnover. Using these variables, they were able to correctly predict which personnel would re-enlist. Involving personal characteristics of workers, Heneman and Yoder (1965) report that men are more likely to change jobs than women, and younger persons are more likely to change jobs than older persons. For workers twenty-five years and older, mobility rates are less than half of those for the 18 to 24 year old groups (Heneman and Yoder, p. 141). Non-white men had a higher rate of change than white men, yet white women had a higher rate of turnover than nonwhite women. Heneman and Yoder's reported annual rates of change for major occupations are found in Table 1.

Much less has been written about environmental influences on turnover over which the employer has little control. Mackay et. al. (1971)

investigated both environmental and personal factors affecting labor turnover. This research showed (1) that employment conditions affect the turnover rate within a labor market because the decision to leave a firm is influenced by the difficulty or availability with which alternative employment is available. Based on this concept, when the labor market is tight, those who are dissatisfied with their present positions are likely to find work elsewhere. Therefore, the turnover rate will increase. Alternatively, when the labor market is slack and few companies are recruiting additional employees, individuals who quit their current positions have a greater risk of unemployment because of increased competition. Mackay et. al. argue, therefore, that the spread between firm quit rates narrows when unemployment rises and widens when unemployment drops. They further argue that the occupational characteristics of a work group may determine quit rates so that a company with a fairly low or high quit rate for one occupational level (such as an unskilled position) may have different rates at other skill levels. Mackay et. al. extended this observation to a theory that labor turnover is the result of a quasi-stationary process where there is a normal level of turnover associated with each particular firm. Any deviation from this norm due to disturbing factors will be of a temporary nature. (2) Mackay et. al. also look at the relationship between turnover and wages and find that firms paying high wage levels have relatively low turnover rates. They note that the emphasis is on the absolute wage level and not on the percentage change in plant earnings. Mackay et. al. state, however, that the differences in plant earning levels do not explain the greatest amount of variation in turnover rates. (3) Mackay et. al. found that plant size apparently has no effect on turnover rates. (4) The study

TABLE I

Turnover Rates

Professional and technical	1 in 12
Managers, officials, & proprietors	1 in 20
Clerical and sales	1 in 10
Skilled	1 in 7
Semiskilled	1 in 7
Laborers/nonfarm	1 in 8

By industry and sex:

	<u>Men</u>	<u>Women</u>
Agriculture	1 in 11	1 in 20
Construction	1 in 4	-----
Manufacturing	1 in 10	1 in 12
Transportation & Public Utilities	1 in 12	1 in 11
Trade	1 in 7	1 in 8
Service	1 in 8	1 in 11
Government	1 in 16	1 in 14

Source: Heneman, Herbert, Jr. and Dale Yoder, Labor Economics, Cincinnati: South-Western Company, 1965.

found that there is a seasonal low in the turnover rate during the fourth quarter between October and December of each year. (5) The study also stated that the size and compactness of the labor market and the availability of alternative employers affects the turnover rate. In a smaller labor market, for example, an employee may be able to change jobs only if he is willing to physically move his place of residence. This may deter turnover. Mackay et. al. also investigated whether turnover generally that is related to personal characteristics is also modified by employment conditions in the external labor market. They found that turnover for short-service employees was particularly sensitive to differences in labor market conditions. When many jobs were available, employees with less than one year's service caused much higher turnover rates than normal.

Other studies have found income to be a predominant factor in turnover. Nixon (1978) studied the determinants of mobility and found that workers attempt to maximize their expected income. They tend to quit more often as the benefits from a job search increase and when the search costs decrease. Slifman (1976) stated that job mobility is associated with the expected income of a new job weighted by the degree of job security. During period of low job security, employees may decline to change jobs even at a higher salary. As a result, turnover may tend to occur mainly during tight labor markets.

Still other studies attribute turnover to various other causes. A study by Reynolds (1959) supported by Davidson and Anderson (1937) and Myers and Maclaurin (1943) shows that there are several factors which affect the turnover of workers. (1) Opportunities for movement between firms occur at the peaks of business cycles when more vacancies exist.

(2) There must be a job which requires the same skills that the employee already has. (3) Semiskilled jobs may be filled by promotion rather than through the outside labor market. (4) General employers' preferences may result in the long-time unemployed having less chance for employment than other individuals. (5) Employers may have specific hiring preferences regarding education, experience, etc. (6) Employers may have anti-pirating agreements--especially in small towns--where they agree not to hire individuals employed at particular firms. (7) There may be a lack of information concerning job vacancies. (8) Employees may be locked into their present job because of a seniority system. (9) Employees have personal attitudes toward mobility such as being satisfied with their present job or not wanting to relocate their families.

Gladys Palmer (1954) did an extensive and widely quoted study on mobility patterns in Chicago, Philadelphia, Los Angeles, San Francisco, St. Paul, and New Haven. She came to the following conclusions: (1) Mobility is not a characteristic of all participants in the labor force, but is concentrated within certain classifications such as younger workers, individuals in manual occupations, and individuals with a short duration of residence within that city. (2) Differences in mobility patterns in a particular city among various groups of individuals are stable regardless of whether the city has a high or low degree of mobility- (3) Differences occur in the amount of mobility at all levels of skill. Even high levels of skill have segments which are more mobile than others. (4) A labor force adapts more readily to changes in the industrial demand for labor than to changes in the occupational structure. (5) Persistent intercity patterns indicate the existence of differences

in regional mobility patterns. (6) Expanding employment within a city attracts workers from outside the general area. These migrants are flexible in adjusting to labor market changes.

Literature on Migration

Migration is a topic that is closely related to turnover. Bunting (1961) investigated the migration between six areas comprised of counties in North Carolina, South Carolina, and Georgia to determine whether labor flowed away from geographic areas where wages are low toward those in which wages were high. He found instead that workers flow to metropolitan areas from non-metropolitan areas. Raimon (1962) made a similar investigation and found a distinct positive relationship between net immigration and above average income levels and also between net out-migration and below average income levels. He also found an association between percentage change in population and average earnings of the employed. Another study using the same data conducted by Blanco (1963) concluded that the availability of jobs rather than the level of wages determined the amount of migration. Eighty-five percent of the variation was accounted for by the change in the level of unemployment. Other studies such as Greenwood (1969), Rogers (1967), and Wadycki (1974) have found higher migration rates into high unemployment areas, while others have found the unemployment rate to be statistically insignificant as an explanatory variable (Gallaway et. al., 1967; Fabricant, 1970; and Miller, 1973). Mackay et. al. (1971) found that most job changes involved only limited geographical movement. Movements were less common for woman than for men. The bulk of employer changes involved an adjustment of travel to work rather than a shift in place of residence. Mackay et. al. also

researched the relationship between occupational, geographical, and industrial mobility. They found that skilled employees were more likely to make only an employer change and that they had more attachment to their particular industry than the unskilled. Hall (1970) found that an unemployed worker is more likely to move to a high-wage, high-unemployment area than to a low-wage, low-unemployment area. Wages may be more important, therefore, than job availabilities.

Literature on Participation

Recent studies have substantiated the hypothesis that labor force participation is sensitive to the business cycle. Tella (1964) concluded that a tight job market discourages labor force participation while an expanding job market encourages it. The female labor force was shown to respond more sensitively than the male labor force to these changes. Dernberg and Strand (1966) found that the participation rates of males below the age of 25, males above the age of 65, and females of all ages were most responsive to changes in the economy. Mincer (1966) suggests that the increases in minimum wages and social security are important factors determining the labor force participation of secondary labor groups. With the advent of various types of assured income, some secondary workers are less likely to enter the work force. Others are prevented from working because of tighter selection procedures caused by minimum wage laws.

A growing amount of literature in labor economics concerns the dual labor market theory and labor market segmentation. Reynolds (1951) confirmed that imperfect information, unequal access to jobs, distinctive mobility patterns, and promotion procedures contribute to segmented labor

labor markets. Becker (1964) and Oi (1972) found that employers have little investment in secondary workers and thus have little incentive to encourage stability. Rosenberg (1975) used cross-sectional data to test for the existence of duality and obtained significant results indicating immobilities between sectors. Many studies have discovered substantial racial differences due to the operation of the labor market in economic returns of education and in access to jobs. Parnes et. al. (1970) found more occupational differences between blacks and whites in their current jobs than there had been at the beginning of their career. Tucker (1970) and Alexander (1974) used longitudinal data and found extensive racial differences in length of service within a firm, therefore reaffirming a characteristic of the secondary labor force. Much recent literature has been concerned with participation of women. Goldberg (1971) found the median income of females as a percentage of that of males fell between 1939 and 1964 in every industrial group which employs a significant number of women. Fuchs (1971) was able to account for only 15 percent of the male-female differential by controlling for color, schooling, age, city size, distance commuted to work, marital status, and class of worker. Occupational segregation has also been significant. Zellner (1972) found that fifty percent of working females fell in only 21 out of almost 300 occupational categories. Twenty-five percent of female workers were in only five of these categories. Although these are only a few of the many studies in this area, general consensus appears to be that the dual labor market and secondary workers do exist.

Literature on the Effects of Unions

Much of the literature written concerning unionization has concentrated on effects in the internal organization. For the purposes of this study, only studies dealing with turnover, wages, or representational elections are reviewed. Freeman (1976) studied the effects of unionization on turnover and found a negative relationship. This confirmed previous studies by Pencavel (1970), Burton and Parker (1969), and Stoikov and Raimon (1968). Presumably this is due to the introduction of grievance systems, better working conditions, and so forth. Kahn (1977) also found that an increase in unionization resulted in a decrease in turnover. He further found that unions were more likely to arise in high wage industries resulting in still higher wages. He, therefore, suggested that unions might cause the existing wage differential between industries to become even wider than at present.

Lewis (1963) wrote one of the original studies on union-nonunion wage differentials and found that unions increased the wage rate 10 to 15 percent above that of nonunion employees. Since then, other studies (Weiss, 1966; Stafford, 1968; and Throop, 1968) have found the differential to range anywhere from 18 to 52 percent depending on the occupation and level of skill. Kahn (1978) has done additional studies on the union-nonunion wage differential since his original one. He found that wage gains obtained by unionized workers produced a cutback in the amount of union labor desired. This in turn caused an increased supply of labor to nonunionized firms with a result of lower wages. Kahn referred to this as the crowding effect. Kahn (1980) again investigated the union spillover effect in a recent study which delineated effects by race

and sex. He found that nonunionized white males averaged higher wages than other groups of nonunion workers such as nonunion women or nonunion white men. Unionization served merely to widen this wage differential. Finally, Kahn found that male nonunionized workers are more likely to feel solidarity with the union movement than nonunion workers in other race-sex categories. Kiefer and Smith (1977) had already tested the relationship between unionization, wages, race, and sex by geographical region. They found that unionization reduced racial wage differentials more in the South than in the North and border regions and increased sex-wage differentials in all regions.

An issue of this research is concerned with effects on representational elections. No literature was found which related the spillover effects of unionization on the number of representational elections held by unorganized firms.

Literature on Help-Wanted Advertising

Increasing interest has been found relating help-wanted advertisements to the state of the economy and the labor market. The National Industrial Conference Board has developed a weighted average of indexes based on the number of help-wanted advertisements placed in leading newspapers of 51 cities (Preston, 1977, p. 3). The index is adjusted to take into account seasonal variations and the number of Sundays in a month. The Conference Board (1977) has found that turning points in the Help-Wanted Index have consistently led business cycle peaks by three to seven months. A falloff in job advertising is predictive of the onset of a recession. Their research also showed that the index tended to remain relatively stable for several months before suddenly sharply

declining (Preston, p. 9). Monthly movements of the Help-Wanted Index have been found to increase with a decline in unemployment. Over the past decade, there has been an upward trend in job advertising indicating a relative increase and change in labor demand. Advertising of job openings has been more abundant than had previously been the case during high periods of unemployment (Preston, pp. 12-13). Although the unemployment rate was driven higher due to the increased participation of women, teenagers, and Vietnam veterans, the increase in the Help-Wanted Index partially reflected an increase in the demand for skilled labor, an increase in turnover due to more mobility, and an increasing reliance on newspaper advertising as a recruitment method by both private firms and employment agencies (Preston, p. 19). The Conference Board's Help-Wanted Index has been tested by several studies. Research by Cohen and Solow (1967, 1970) and Burch and Fabricant (1968) showed an inverse relationship between the Help-Wanted Index and the unemployment rate. Gujarati (1969) found that the relationship between the two was unstable and could not be relied upon to have any predictive power.

Other studies have been conducted concerning additional aspects of help-wanted advertising. Boschan (1966) found that help-wanted ads are placed mainly for better paid positions and to attract professionals, urban white-collar, and skilled workers. The Conference Board states that more unemployed workers between the ages of 20 and 34 use advertisements as a source of jobs than any other age group. Only 30 percent of unemployed workers, however, use want-ads at all to find employment (Preston, p. 19). Martin (1971) found that in extreme periods of labor shortages, help-wanted advertising is only marginally effective. During a mild recession, Hughes Aircraft Company placed a four inch, one column

classified advertisement for electronics technicians which produced 437 responses. During a period of labor shortages, the same advertisement was expanded to two columns by twenty inches which only brought two replies. Martin states that words such as "announcing, new, administration, management, supervisor, career, and personnel" have been proven to draw more responses while headlines in the form of a question also generate a better than average response.

THEORY AND RESEARCH DESIGN

Turnover and Employment

According to conventional economic theory, submarkets are connected by relative wages. If resources are fully employed in the total economy, then relative wages distribute labor among occupations, industries, and geographic localities. Some submarkets may, however, still have less than full employment. Due to a difference in demand shifts between submarkets, some markets may be at equilibrium, while others have excess supply or excess demand. Theoretically, labor market adjustments occur as individuals and firms move between labor surplus and labor shortage areas. When the total economy is at less than full employment, relative wages may still allocate labor due to the movement of firms to obtain lower labor costs or the movement of individuals to obtain employment (Behman, 1978).

Other theories have been developed emphasizing the importance of wages. The classical compensatory wage model states that equilibrium occurs when the sum of the individual workers' inducement utility is equal to his contribution utility. As equilibrium is approached, the turnover rate tends toward zero. Based on this framework, it follows that a worker desires to obtain the highest possible income given individual preferences for money, leisure time, and other opportunities available. The human investment theory of migration developed by Sjaastad (1962) was an extension of this concept. He stated that the

primary factor in migration is the difference in the net present value between labor markets of future lifetime income. Individuals would be more likely, therefore, to migrate from places with low net present values to places with higher net present values.

Based on these theories, the individual will attempt to maximize income through turnover or migration. According to at least one account ("GM Settles," Iron Age), General Motor's average wages are approximately twice that paid at other manufacturing firms in the Oklahoma City area. Therefore,

Hypothesis #1: There is a positive relationship between the opening of the General Motors plant and an increase in turnover for firms competing in the same labor market.

Hypothesis #2: There is a positive relationship between the increase in transportation manufacturing employment and a decrease in employment of other types of manufacturing.

Participation

The primary theory related to participation and labor market segmentation is the theory of the dual labor market. The differences between primary and secondary jobs are described as,

"The primary market offers jobs which possess several of the following traits: high wages, good working conditions, employment stability and job security, equity and due process in the administration of work rules and chances for advancement. The.....secondary market has jobs which, relative to those in the primary sector, are decidedly less attractive. They tend to involve low wages, poor working conditions, considerable variability in employment, harsh and often arbitrary discipline, little opportunity to advance" (Osterman, 1975, p. 509).

Hall (1970) found that during periods of expansion, many employers may refuse to hire secondary workers in primary markets using means such as

subcontracting, using overtime, and changing job requirements. Rosenberg (1975) found little mobility between the primary and secondary sectors. These studies lead to the following hypothesis:

Hypothesis #3: There is no relationship between the opening of the General Motors plant and participation of women and minorities in the Oklahoma City SMSA labor force.

Unionization

Researchers have long been aware that wages and working conditions in unionized firms indirectly affect the wages and working conditions of nonunionized firms (Kahn, 1978). Two mechanisms for transmitting such effects are the crowding and threat effects. The threat effect is based on the idea that because employees see the benefits of unionization in other firms, employers try to keep their wages, benefits, and working conditions at some comparable level in order to avoid the prospect of unionization. Kahn has found that the higher wages of unionized firms may necessitate labor cutbacks which then force unionized workers to seek jobs in nonunion firms (the crowding effect). Thus, in order to determine whether employer fears are to an extent justified, the following hypotheses will be tested:

Hypothesis #4: There is a positive relationship between the unionization of the General Motors plant and an increase in the number of NLRB representational elections won by unions in Oklahoma City.

Hypothesis #5: There is a positive relationship between the unionization of the General Motors plant and an increase in the number of NLRB representational elections held by unorganized firms in Oklahoma City.

Help-Wanted

Due to the effects of supply and demand within the labor market, there may be a shortage or surplus of certain types of skills until equilibrium is achieved. According to a recent report, General Motors has had need for skilled labor such as electricians or tool makers (Zizzo, 1980). Furthermore, increased demand should be reflected in increased wages. Therefore,

Hypothesis #6: There is a positive relationship between the opening of the General Motors plant, a shortage of skilled labor, and an increase in real manufacturing wages for electricians and tool makers (or a proxy variable reflecting such wages).

Methodology

In order to test hypotheses #1 and #2, data concerning the Oklahoma City SMSA employment by industry, manufacturing turnover rates, and unemployment rates were obtained from the publication, Oklahoma Labor Market, for the period January 1978 through November 1979. The Tulsa SMSA was chosen for a point of comparison due to its similarity in geographical location, economy, unemployment rates, and dependence on the oil industry. Tables with this data can be found in Appendix I. Four regression equations were used to test the hypothesized relationships in a time series application. The Statistical Package for Social Sciences was used for both the regression analyses and the computation of correlations. The dependent variables included Oklahoma City transportation manufacturing employment, Oklahoma City total manufacturing quits, Oklahoma City unemployment rates, and the dummy variable. The

independent variables included Oklahoma City total manufacturing employment, Tulsa total manufacturing employment, Tulsa transportation equipment manufacturing employment, the Tulsa unemployment rate, the dummy variable, Oklahoma City transportation equipment manufacturing, the Oklahoma City unemployment rate, Oklahoma City total manufacturing quits, and Oklahoma City non-manufacturing quits.

The initial regression equation was utilized to determine the relationships between Oklahoma City transportation equipment manufacturing employment, and the following independent variables which were entered step-wise: (1) the Oklahoma City total manufacturing employment, (2) Tulsa total manufacturing employment, (3) Tulsa transportation equipment manufacturing employment, and (4) the dummy variable. It was predicted that the dependent variable would be positively related to an increase in Oklahoma City total manufacturing employment and positively related to the dummy variable. The Tulsa employment figures were used as a control for general economic fluctuations.

The second regression equation investigated the relationship between the Oklahoma City unemployment rate and the following dependent variables which were entered step-wise: (1) the Tulsa unemployment rate, (2) the dummy variable, (3) Tulsa transportation manufacturing employment, and (4) Oklahoma City transportation equipment manufacturing employment. It was predicted that an increase in the Oklahoma City unemployment rate would be negatively related to the dummy variable and negatively related to an increase in transportation equipment manufacturing employment. Again, the Tulsa figures were used as a control for overall economic factors.

The final regression was used as a check on the accuracy of the other three regression equations, although an assumption was violated by using the dummy as a dependent variable. The following independent variables were entered step-wise: (1) Oklahoma City transportation equipment manufacturing employment, (2) Oklahoma City total manufacturing quits, and (3) Oklahoma City non-manufacturing quits. It was predicted that the dummy variable would be positively related to an increase in transportation equipment manufacturing employment, positively related to an increase in total manufacturing quits, and a smaller but positive relationship with an increase in non-manufacturing quits.

Published data were not available to test the remainder of the hypotheses. The only figures relating to Oklahoma City participation rates were for the insured unemployed which were not separated by industry or by race, and which would not include those not eligible for unemployment insurance. Data on NLRB representational elections has been published only for elections held prior to August 31, 1979, the month when General Motor's elections was held. Therefore, data concerning elections subsequent to the General Motors election were unavailable. Finally, data from the Help-Wanted Index was also unavailable for the period after the General Motors plant opened. This data would not, at any rate, have been separated by industry or skill. Walsh, Johnson, and Sugarman (1975) studied help-wanted ads in San Francisco and Salt Lake City by analyzing the number and size of ads and found it was not a reliable indicator of trends in the local labor market. Due to these obstacles, the decision was made to utilize a Delphi study to solicit opinions from knowledgeable individuals concerning forecasts for the year 1985.

The Delphi procedure consisted of three questionnaire administrations. The first Delphi questionnaire contained seven questions. The first was concerned with the Oklahoma City unemployment rate for 1985 in order to understand the respondent's perception of the economy in answering the remainder of the questions. The second and third questions involved an estimate of an increase or decrease in NLRB representational elections and an increase or decrease in the number of elections won by the union. The fourth and fifth questions determined the nature of skills which would be in shortage or in surplus in 1985. It was predicted that answers would be based in part on manpower difficulties that the respondents were having at the present time. The sixth question was an attempt to utilize the Delphi procedure as a policy making and problem solving device. The question involved a solution to alleviate the problems of labor shortages and surpluses that might be forthcoming. The seventh and final question required the respondent's estimate of a change in manufacturing real wages over the next five years.

The second Delphi questionnaire involved the same questions as the initial questionnaire with the exception of question six. Due to a general consensus and an apparent lack of interest in this question on the part of the respondents in round I, this question was dropped from the second questionnaire. In addition to the original questions, each respondents was asked to list the assumptions on which their estimate was based. Respondents were given the range of estimates as well as the mean from all participants in round I.

The third questionnaire again asked the questions contained in the initial questionnaire with the exception of question six. As in the previous round, respondents were given the range of responses and the mean

for all participants from round II. The Delphi questionnaires can be found in Appendix II.

The sample consisted of individuals residing in and knowledgeable of the Oklahoma City labor market. Of the nine individuals originally contacted to complete three rounds of the questionnaire, five eventually participated. Two were personnel managers of small manufacturing firms, two were associated with different unions, and one was an executive with a temporary manpower agency. All were promised anonymity in completing the questionnaires which were conducted by mail.

RESULTS AND ANALYSIS

Independent Variable Intercorrelations

The first phase of the analysis consisted of reporting intercorrelations between the set variables which served as potential independent variables in the stepwise regression procedure. Table 2 defines each of the fourteen variables while Table 3 shows the correlation coefficients of all variables. A number of significant interrelationships were found. High correlations were found to exist between Oklahoma City manufacturing employment, Oklahoma City nonmanufacturing employment, and Oklahoma City transportation equipment manufacturing employment, although correlations were slightly less for the latter two. Correlations were also, however, high between these same Oklahoma City variables and manufacturing employment, nonmanufacturing employment, and transportation equipment manufacturing employment in Tulsa. The correlation between the General Motors plant dummy variable and Oklahoma City manufacturing employment was .89, with Oklahoma City nonmanufacturing employment, .80, and with Oklahoma City transportation equipment manufacturing employment, .89. The only high correlation between quits appeared to be between Oklahoma City manufacturing quits and Tulsa manufacturing quits (.90). The Oklahoma City unemployment rate and the Tulsa unemployment rate had a correlation coefficient of .76.

The second phase of the analysis involved the four stepwise regression equations previously discussed. A summary of results is found in Tables 4, 5, 6, and 7.

Regression Results

Table 4 contains the summarization of the regression equation utilizing Oklahoma City transportation manufacturing equipment employment as the dependent variable. Ninety-six percent of the variance is explained by Oklahoma City total manufacturing employment, Tulsa total manufacturing employment, and Tulsa transportation equipment manufacturing employment. The dummy variable was eliminated through the stepwise entry due to its lack of predictive power. As was expected, Oklahoma City manufacturing employment was found to have a significant positive relationship with Oklahoma City transportation equipment manufacturing. Although unexplainable, a significant negative relationship was found to exist between Oklahoma City transportation equipment manufacturing employment and Tulsa manufacturing employment. The Tulsa variables were used to control for general economic conditions due to Tulsa's similarity in location, industry, and economy. Even though the stepwise procedure was employed there is substantial multicollinearity in the independent variables.

Data from the second regression equation are shown in Table 5. As in the first regression equation, Tulsa variables were used to control for general economic conditions. As predicted, there was a significant positive relationship between the Tulsa and Oklahoma City unemployment rates. Also as predicted, the dummy variable was negatively related to the Oklahoma City unemployment rate, however it was not statistically

TABLE II

Variable Definitions

- X1 - The month and final digit of the year of each case
- X2 - Oklahoma City total manufacturing employment
- X3 - Oklahoma City total non-manufacturing employment
- X4 - Oklahoma City total transportation equipment manufacturing
- X5 - Oklahoma City transportation quits per one hundred employees
- X6 - Oklahoma City total manufacturing quits per one hundred employees
- X7 - Oklahoma City unemployment rates
- X8 - Dummy variable used to control for the existence of the GM Plant
- X9 - Tulsa total manufacturing employment
- X10 - Tulsa total non-manufacturing employment
- X11 - Tulsa transportation equipment manufacturing employment
- X12 - Tulsa transportation quits per one hundred employees
- X13 - Tulsa manufacturing quits per one hundred employees
- X14 - Tulsa unemployment rate

TABLE III

Pearson Product Correlations

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄
X ₁														
X ₂	.45													
X ₃	.57	.95												
X ₄	.36	.97	.86											
X ₅	-.06	-.22	-.18	-.21										
X ₆	.35	.36	.42	.32	.53									
X ₇	-.47	-.49	-.52	-.44	-.09	-.46								
X ₈	.19	.89	.80	.89	-.12	.40	-.51							
X ₉	.49	.84	.92	.74	-.13	.44	-.48	.68						
X ₁₀	.68	.84	.95	.72	-.02	.56	-.55	.67	.91					
X ₁₁	.47	.84	.90	.75	-.20	.41	-.46	.69	.98	.87				
X ₁₂	-.52	-.48	-.63	-.36	.16	-.25	.18	-.27	-.74	-.68	-.77			
X ₁₃	.24	.01	.09	-.02	.61	.90	-.23	.05	.16	.31	.11	-.14		
X ₁₄	-.62	-.63	-.78	-.52	-.16	-.58	.76	-.52	-.77	-.87	.70	.48	-.39	

Rounded to nearest hundredth

significant. Therefore, when the General Motors plant opened, the Oklahoma City unemployment rate decreased. Although not significant, there was a positive relationship between Oklahoma City transportation manufacturing employment and the Oklahoma City unemployment rate. This was contrary to the predicted result. As in the initial results there are problems of multicollinearity.

Table 6 shows that there is a significant negative relationship between Oklahoma City total manufacturing quits and the Oklahoma City unemployment rate. This was the same finding as reported by Mackay et. al. (1971). This result shows that turnover is influenced by the tightness of the labor market. As the unemployment rate drops and there is less competition for jobs, the turnover rate increases. Although not significant, the opening of the General Motors plant was also found to be positively related to an increase in Oklahoma City manufacturing turnover rates. It can be speculated that employees in other manufacturing industries quit to obtain employment with General Motors. Contrary to the predicted relationship, a negative relationship was found to exist between Oklahoma City manufacturing quits and Oklahoma City transportation manufacturing employment. Once again, there is substantial multicollinearity even though the stepwise procedure was employed.

The final regression was used as a check on the previous regressions. A significant positive relationship was found between the opening of the General Motors plant and an increase in transportation manufacturing employment. Again, a positive although not significant relationship between the opening of the General Motors plant and an increase in Oklahoma City manufacturing quits was found. Furthermore, as predicted, a positive but not significant relationship was found between the opening

TABLE IV

REGRESSION ANALYSIS WITH OKLAHOMA CITY TRANSPORTATION

EQUIPMENT MANUFACTURING EMPLOYMENT AS THE DEPENDENT VARIABLE, STEPWISE ENTRY

<u>Variable</u>	<u>B</u>	<u>t-value</u>
Constant	-46.927	
X ₂ - OKC manufacturing employment	.530	14.168 ^a
X ₉ - Tulsa manufacturing employment	-.302	1.788 ^b
X ₁₁ - Tulsa transportation manufacturing employment	.197	.759
R ² = .96 F = 163.		
Dubin Watson = 1.419		
a = Significant at the .005 level, one-tailed test.		
b = Significant at the .05 level, one-tailed test.		

TABLE V

REGRESSION ANALYSIS WITH THE OKLAHOMA CITY UNEMPLOYMENT RATE

AS THE DEPENDENT VARIABLE, STEPWISE ENTRY

<u>Variable</u>	<u>B</u>	<u>t-value</u>
Constant	.641	
X ₁₄ - Tulsa unemployment	.630	4.066 ^a
X ₈ - dummy	-.234	1.045
X ₁₁ - Tulsa transportation manufacturing employment	.816	1.192
X ₄ - OKC transportation manufacturing employment	.895	.114
R ² = .63 F = 7.574		
Dubin Watson = 1.840		

A - Significant at the .005 level, one-tailed test.

TABLE VI
REGRESSION ANALYSIS WITH OKLAHOMA CITY TOTAL MANUFACTURING
QUITS AS THE DEPENDENT VARIABLE, STEPWISE ENTRY

<u>Variable</u>	<u>B</u>	<u>t-value</u>
Constant	7.649	
X_7 - OKC unemployment rate	-.887	1.523 ^c
X_8 - dummy	.608	.755
X_9 - OKC transportation manufacturing employment	-.732	.302

$$R^2 = .25$$

$$F = 2.147$$

$$\text{Dubin Watson} = 1.410$$

C - Significant at the .10 level, one-tailed test.

TABLE VII
REGRESSION ANALYSIS WITH THE DUMMY VARIABLE (EXISTANCE OF THE GENERAL
MOTORS PLANT IN OKLAHOMA CITY: AS THE DEPENDENT VARIABLE, STEPWISE ENTRY

<u>Variable</u>	<u>B</u>	<u>t-value</u>
Constant	-2.411	
X_4 - OKC transportation manufacturing employment	.240	3.805 ^a
X_6 - OKC manufacturing quits	.602	.967
X_3 - OKC non-manufacturing quits	.367	.463

$$R^2 = .80$$

$$F = 25.549$$

$$\text{Dubin Watson} = .960$$

a = Significant at the .005 level, one-tailed test.

of the General Motors plant and Oklahoma City nonmanufacturing quits. It can be speculated that a lesser amount of employees working for non-manufacturing industries also quit to obtain employment at the new General Motors plant. Eighty percent of the variance was explained by Oklahoma City transportation equipment manufacturing employment, Oklahoma City manufacturing quits, and Oklahoma City nonmanufacturing quits. Unfortunately, the low Durbin Watson value of .960 indicates substantial serial correlation.

Delphi Results

The third and final phase of the analysis consisted of the Delphi study. The results are contained in Table 8. Little change in estimates occurred between round I and round II, and no change occurred for any of the respondents between round II and round III.

For question 1, the estimates of the Oklahoma City SMSA unemployment rate for 1985 ranged from 2.3 to 5.5 percent. No respondent changed an estimate from that given in the first round.

Question 2 concerned the amount of change in the number of NLRB representational elections held in Oklahoma City. Only one respondent changed estimates from that given in the initial round. Final estimates ranged from a decrease of 5 percent to an increase of 45 percent. All but one respondent believed there would be an increase in the number of elections held. Also as would be expected, union officials had two of the higher estimates.

Question 3 was concerned with the increase in successful representational elections within the next five years. Estimates of the degree of private sector unionization ranged from an increase of 15 to 23.5 percent.

TABLE 8

Results of the Delphi Study

Question 1 - The December 1979 unemployment rate in the Oklahoma City

SMSA was 2.9%. In December 1985, the unemployment rate for the Oklahoma City SMSA will be ____%.

Respondents	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	2.7%	2.3%	3.0%	4%	5.5%
Round II	Same	Same	Same	Same	Same
Round III	Same	Same	Same	Same	Same

Question 2 - Due to the introduction of several large unionized companies in the Oklahoma City area, union representation elections (including both successful and unsuccessful) in Oklahoma City will increase/decrease by ____ %.

Respondents	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	Inc. 59%	Inc. 38.29%	Inc. 20%	Inc. 25%	Dec. 5%
Round II	Inc. 45%	Same	Same	Same	Same
Round III	Same	Same	Same	Same	Same

Question 3 - From May 1973-May 1975, 10% of all Oklahoma City private sector workers and 18% of Oklahoma City production workers were unionized. In 1985, ____% of Oklahoma City private sector workers and ____% of Oklahoma City production workers will be unionized.

Respondents	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	15%-43%	23.5%-26%	20%-30%	20%-30%	20%-28%
Round II	Same	Same	Same	Same	Same
Round III	Same	Same	Same	Same	Same

Question 4 - In 1985, what employment skills will be in short supply?

Respondent	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	Secretary Typists	Building trade, machinist	machinists Electronic and computer technicians	technical, highly skilled	engineers, accountants, machinists, programmers, tool & die makers, Doctors, nurses
Round II	Same	Same	Same as above plus tool designers	Same	Same
Round III	Same	Same	Same	Same	Same

Question 5 - In 1985, there will be a surplus of what types of employment skills?

Respondent	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	Aeronautical engineers, manual labor	unskilled, farm workers	assembly line, unskilled	construction	teachers
Round II	Same	Same	Same	Same	Same
Round III	Same	Same	Same	Same	Same

Question 6 - What can the Oklahoma City government or the private sector do to help these problems?

Respondent	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	job enrichment, attitude change	training	training	training	training

Question 7 - In January 1980, Oklahoma City area manufacturing workers earned an average of \$7.32 an hour. Between 1980-1985, real wages (excluding for the effects of inflation) will increase/decrease ____%.

Respondent	(Manpower) (Agency)	(Union)	(Personnel Mgr.)	(Union)	(Personnel Mgr.)
Round I	Inc. 62.1%	Inc. 46%	Inc. 5%-10%	Inc. 20%	Inc. 20%
Round II	Inc. 50%	Inc. 40%	Same	Inc. 30%	Inc. 35%
Round III	Same	Same	Same	Same	Same

Estimates for unionized production workers ranged from an increase of 26 to 43 percent. One respondent attributed this increase to the new industries moving into the area.

Questions 4 and 5 involved the prediction of skills which would be in surplus and shortage by 1985. As predicted, skills such as machinists and tool and die makers were listed several times. One of the personnel managers commented that these were skills difficult to obtain at the present time. Occupations listed as being in surplus such as teachers and aeronautical engineers are skills that have been in surplus in the past.

More attempt was made to achieve a consensus in question 7 than in any other question. Four out of the five respondents changed their estimate in the second round. Final estimates ranged from an increase in real wages of from 5 to 50 percent by 1985.

SUMMARY AND CONCLUSIONS

The purpose of this study was to discover relationships between the opening of the General Motors plant in Oklahoma City and various manpower indicators such as turnover, changes of employment between industries, and potential changes in unionization. As Mackay et. al. (1971) and Slifman (1976) have found, a significant negative relationship was found to exist between Oklahoma City total manufacturing quits and the Oklahoma City unemployment rate. Therefore, when economic conditions exist so that the labor market is tight, a greater turnover rate will result. This study also found an indication of a relationship between the opening of the General Motors plant and an increase in both manufacturing and nonmanufacturing turnover in the Oklahoma City SMSA. It may be speculated that this turnover was due in part to the availability of positions at the General Motors plant at a higher wage rate than that paid by other Oklahoma City firms. Finally, expected significant positive relationships were found to exist between (1) the opening of the General Motors plant and an increase in transportation equipment manufacturing employment, and between (2) the opening of the plant and a decrease in the Oklahoma City unemployment rate. The reader should be cautioned, however, that there is a lack of significance of the GM variable, that there are problems of multicollinearity, and that in the final regression there is substantial serial correlations. Nonetheless, the multicollinearity problems are probably a result of overspecification

of the model and would not be involved with entry of the GM variable in more simple models. The Delphi study further predicted a shortage of skills which, not coincidentally, are those required by General Motors, as well as increases in real wages and unionization in the Oklahoma City SMSA. It appears that the General Motors plant may have had considerable impact on the Oklahoma City labor market for the foreseeable future.

Several factors may have limited the effect of this study. The predominant factor is that of the present state of the economy. A recession has had major impact on the operation of the automobile industry in recent months, with a resulting layoff of thousands of experienced automobile workers. These General Motors employees are eligible to transfer to any opening which might occur in the Oklahoma City plant. Other Oklahoma City employees may have decided they have more job security at their current position. These two factors may have resulted in a lower Oklahoma City turnover rate than would otherwise have been the case.

A second complication may have been the use of the available turnover data. Employees who account for a disproportionate amount of turnover may bias the quit and assessment data which are readily available.

A final factor which may have influenced the results of this study is the short time during which the General Motors plant has been open. This precluded the availability of any information on some topics and limited the amount of data available on others. A study done at a later date and during different economic conditions might show a more substantial increase in the impact of General Motors on the Oklahoma City labor market than that shown by this study.

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APPENDICES

APPENDIX I
LABOR MARKET DATA

Unemployment Data (in thousands)

Date	<u>Labor Force</u>		<u>Number Unemployed</u>		<u>Per Cent of Labor Force Unemployed</u>	
	OKC	TULSA	OKC	TULSA	OKC	TULSA
12-77	369,700	296,900	12,900	12,600	3.5	4.2
1-78	363,500	291,900	13,600	12,500	3.1	4.3
2-78	367,100	293,700	16,200	15,000	4.4	5.1
3-78	370,300	296,300	13,100	11,500	3.5	3.9
4-78	373,000	297,100	11,600	10,800	3.1	3.6
5-78	379,300	300,700	12,400	10,800	3.3	3.6
6-78	386,600	304,600	14,700	11,500	3.8	3.8
7-78	383,800	305,000	13,300	11,100	3.5	3.6
8-78	383,000	304,900	12,400	10,000	3.2	3.3
9-78	387,700	303,400	12,600	10,300	3.2	3.4
10-78	388,300	301,800	12,500	10,100	3.2	3.3
11-78	387,000	302,700	12,900	10,800	3.3	3.6
12-78	390,200	302,700	12,200	9,700	3.1	3.2
1-79	381,400	297,700	13,900	11,700	3.6	3.9
2-79	386,100	299,100	15,600	10,900	4.0	3.6
3-79	390,000	300,700	12,100	10,100	3.1	3.4
4-79	393,900	300,600	12,600	10,400	3.2	3.5
5-79	396,400	302,100	11,300	8,800	2.9	2.9
6-79	405,800	307,200	12,900	10,500	3.2	3.4
7-79	403,800	308,400	12,800	10,900	3.2	3.5
8-79	401,900	304,700	12,200	9,500	3.0	3.1
9-79	406,400	303,700	12,500	9,100	3.1	3.0
10-79	409,500	303,800	12,900	9,700	3.2	3.2
*11-79	412,600	306,800	12,100	9,900	2.9	3.2

*Preliminary

1978 BENCHMARKS

OKLAHOMA CITY EMPLOYMENT BY INDUSTRY

Date	Total	Mining	Contract Construction	Total Mfg.	Finance Transportation Wholesale & Insurance & & Public Util. Retail Trade Real Estate Service Gov. Non-Mfg.					
12-77	348,000	11,500	17,700	45,300	20,800	88,100	21,500	58,500	84,600	
1-78	342,900	11,600	16,200	45,500	21,400	84,400	21,600	58,400	83,800	297,400
2-78	343,400	11,600	14,900	45,700	20,900	84,500	21,700	59,000	85,100	297,700
3-78	349,500	11,800	17,300	46,200	21,100	85,800	21,800	59,900	85,600	303,300
4-78	353,100	12,000	18,300	46,100	21,400	87,100	22,300	60,200	85,700	307,000
5-78	357,300	12,200	19,400	46,600	21,600	87,600	22,600	60,700	86,600	310,700
6-78	360,400	12,400	20,100	47,300	21,600	87,600	23,100	62,400	85,900	313,100
7-78	360,300	12,600	20,500	47,400	21,600	87,500	23,200	62,600	84,900	312,900
8-78	362,800	12,800	21,500	47,700	21,700	88,100	23,300	62,400	85,300	315,100
9-78	369,000	12,800	21,500	47,700	21,900	90,000	23,100	62,800	89,200	321,300
10-78	369,800	12,800	21,000	48,400	21,900	89,600	23,000	63,000	90,100	321,400
11-78	370,200	12,600	20,700	48,900	22,000	90,600	23,100	63,400	88,900	321,300
12-78	373,800	13,200	20,200	49,000	21,900	93,300	23,200	63,700	89,300	324,800
1-79	369,600	13,500	18,300	49,300	21,900	90,700	23,300	63,800	88,800	320,300
2-79	370,500	13,500	18,000	48,800	22,200	90,200	23,200	64,300	90,300	321,700
3-79	376,500	13,600	18,800	50,700	22,500	92,000	23,200	65,200	90,500	325,800
4-79	381,000	13,800	19,300	52,100	22,700	93,000	23,700	65,200	91,200	328,900
5-79	383,300	13,000	20,300	52,500	22,700	93,800	23,900	65,900	91,200	330,800
6-79	387,900	13,200	21,000	53,400	22,700	94,500	24,400	67,300	91,400	334,500
7-79	386,500	13,300	21,300	53,400	22,800	94,800	24,400	67,800	88,700	333,100
8-79	389,000	13,500	21,400	54,000	22,800	95,900	24,400	68,000	89,000	335,000
9-79	393,400	13,500	21,000	54,200	22,000	96,800	24,400	67,700	93,800	339,200
10-79	397,200	13,600	20,800	55,700	22,500	96,800	24,400	67,900	95,500	341,500
*11-79	400,400	13,700	20,800	57,000	22,700	97,800	24,300	68,000	95,00	342,800

*Preliminary

1978 BENCHMARKS

OKLAHOMA CITY EMPLOYMENT IN MANUFACTURING INDUSTRIES

Date	Total Mfg.	Durable Goods	Primary & Fabricated Metals	Machinery	Transportation Equipment	Nondurable Goods	Food and Kindred Products	Printing and Publishing
12-77	45,300	28,300	5,800	14,500	4,100	17,000	6,700	3,900
1-78	45,500	28,300	5,700	14,600	4,300	17,200	6,700	3,900
2-78	45,700	28,700	5,700	14,700	4,300	17,000	6,700	3,900
3-78	46,200	29,000	5,700	14,900	4,400	17,200	6,700	4,000
4-78	46,100	28,900	5,700	15,100	4,000	17,200	6,700	4,000
5-78	46,600	29,400	5,700	15,200	4,300	17,200	6,800	4,000
6-78	47,300	29,700	5,800	15,100	4,500	17,600	6,900	4,000
7-78	47,400	29,900	5,700	15,200	4,600	17,500	7,000	4,000
8-78	47,700	30,100	5,900	15,300	4,500	17,600	7,000	3,900
9-78	47,700	30,100	5,900	15,200	4,500	17,600	7,000	4,000
10-78	48,400	30,600	5,900	15,500	4,600	17,800	7,100	4,000
11-78	49,100	31,000	5,800	15,800	4,400	18,100	7,100	3,800
12-78	49,000	31,000	5,900	15,800	4,600	18,000	7,100	4,000
1-79	49,300	31,300	6,000	15,800	4,900	18,000	7,100	4,000
2-79	48,800	30,900	6,000	14,800	5,200	17,900	7,000	4,000
3-79	50,700	32,500	6,000	15,900	5,700	18,200	7,100	4,100
4-79	52,100	33,600	6,000	16,100	6,600	18,500	7,100	4,100
5-79	52,500	33,900	6,000	16,200	6,700	18,600	7,100	4,200
6-79	53,400	34,500	6,100	16,300	7,000	18,900	7,100	4,200
7-79	53,400	34,600	6,000	16,500	7,000	18,800	7,200	4,200
8-79	54,000	35,000	6,200	16,600	7,700	19,000	7,200	4,200
9-79	54,200	35,200	6,200	16,500	7,300	19,000	7,300	4,200
10-79	55,700	36,400	6,200	16,500	8,300	19,300	7,500	4,200
*11-79	57,600	38,100	6,300	16,500	9,800	19,500	7,500	4,200

*Preliminary

1978 Benchmarks

TULSA EMPLOYMENT BY INDUSTRY

Date	Total	Total Mfg.	Total Non-Mfg.	Transportation Equipment
1-78	259,700	54,600	205,100	4,800
2-78	257,100	52,100	205,000	3,000
3-78	262,800	53,500	209,300	3,000
4-78	263,900	53,500	210,400	2,900
5-78	268,400	56,100	212,300	5,500
6-78	270,600	56,700	213,900	5,500
7-78	271,800	57,000	214,800	5,600
8-78	274,000	57,100	216,900	5,500
9-78	272,900	56,700	216,200	5,700
10-78	272,700	57,000	215,700	5,800
11-78	273,900	57,500	216,400	6,000
12-78	274,700	57,700	217,000	6,000
1-79	272,000	57,600	214,400	6,100
2-79	273,100	58,700	214,400	6,500
3-79	274,700	58,700	216,000	6,600
4-79	274,600	58,200	216,400	6,600
5-79	276,800	58,300	218,500	6,600
6-79	277,500	58,500	219,000	6,700
7-79	278,400	58,800	219,600	6,900
8-79	279,200	59,400	219,800	7,200
9-79	279,600	59,000	220,600	7,300
10-79	279,800	59,500	220,300	7,500
*11-79	280,800	60,100	220,700	7,700

*Preliminary

1978 Benchmarks

OKLAHOMA CITY LABOR TURNOVER RATE IN MFG (per 100 employees)

51

Date	Accession Rates								Separation Rates											
	Total				New Hires				Total				Quits				Layoffs			
	Total Mfg	Metal Proc	Mach	Trans Equip	Total Mfg	Metal Proc	Mach	Trans Equip	Total Mfg	Metal Proc	Mach	Trans Equip	Total Mfg	Metal Proc	Mach	Trans Equip	Total Mfg	Metal Proc	Mach	Trans Equip
12-77	3.6	5.2	1.9	2.3	3.0	4.7	1.9	1.8	3.7	4.4	1.6	1.6	2.5	3.0	1.2	1.0	.5	<.05	<.05	<.05
1-78	5.5	6.5	4.3	4.9	4.9	6.3	4.1	4.2	4.9	5.	3.	3.	3.6	4.3	2.2	1.6	.4	<.05	<.05	.2
2-78	4.5	5.6	3.6	2.7	4.1	5.5	3.5	2.3	4.4	5.3	2.4	2.9	3.1	4.2	1.7	1.7	.3	<.05	<.05	.1
3-78	5.9	6.8	4.3	2.9	5.3	6.7	4.1	2.7	6.3	7.0	3.2	13.7	4.0	5.7	2.4	2.8	1.2	<.05	<.05	9.5
4-78	6.0	6.1	4.2	12.9	4.7	6.0	4.1	2.9	5.2	5.7	3.1	3.1	4.0	4.8	2.5	2.7	.3	<.05	<.05	<.05
5-78	6.9	10.8	4.2	3.7	6.3	10.7	3.9	3.5	5.6	6.4	3.6	3.4	4.1	5.3	2.3	2.6	.5	<.05	.4	<.05
6-78	6.5	8.7	3.5	4.3	5.8	8.6	3.2	4.1	6.3	7.0	4.5	4.1	4.3	6.0	2.4	2.5	.9	<.05	1.1	.6
7-78	6.1	6.4	2.4	4.8	5.6	6.3	2.4	4.6	6.0	7.0	2.8	5.7	4.8	6.2	2.0	3.6	.4	<.05	<.05	1.2
8-78	8.2	10.8	5.1	5.4	7.3	10.4	4.2	5.1	8.6	9.8	5.4	6.5	6.8	8.0	3.9	3.5	.4	<.05	<.05	.2
9-78	7.3	9.3	4.5	6.9	6.5	9.1	4.0	6.7	6.7	8.8	3.7	4.9	5.3	6.7	2.9	2.6	.4	1.1	<.05	.1
10-78	7.3	8.6	5.3	5.8	6.7	8.3	5.2	5.6	6.3	7.1	3.6	7.2	4.7	6.1	2.6	2.4	.5	<.05	<.05	2.2
11-78	5.7	6.6	3.5	2.7	5.2	6.1	3.4	2.6	5.8	5.8	2.8	4.2	4.3	4.4	1.9	1.9	.5	.1	<.05	.1
12-78	4.0	3.3	2.1	2.2	3.4	3.0	1.8	2.1	4.9	4.8	2.4	6.5	3.3	3.7	1.5	1.3	.6	<.05	.1	2.7
1-79	5.9	6.3	3.9	3.7	5.3	5.9	3.7	3.3	5.3	5.6	3.0	4.0	3.6	4.5	1.7	1.8	.5	<.05	.2	.2
2-79	5.3	6.3	3.3	1.6	4.8	6.0	3.2	1.5	5.2	5.4	3.1	3.6	3.7	4.5	2.0	1.7	.5	.1	<.05	.9
3-79	7.0	7.2	4.9	4.2	6.2	6.7	4.5	4.1	7.1	7.9	4.2	7.9	5.0	6.2	3.3	2.8	.8	<.05	<.05	3.4
4-79	6.6	6.5	5.3	3.4	5.9	6.2	5.1	3.2	6.3	6.9	4.4	3.3	4.9	5.7	3.4	2.3	.5	.1	<.05	<.05
5-79	7.7	8.9	6.2	4.7	7.1	8.6	6.1	3.6	6.3	8.0	4.6	4.4	5.0	6.6	3.7	2.9	.3	<.05	<.05	.2
6-79	7.2	9.0	4.9	3.6	6.2	8.3	4.7	3.0	6.8	8.2	4.1	4.0	4.9	7.4	3.0	2.8	.4	<.05	<.05	.1
7-79	7.0	7.1	4.6	4.9	6.4	6.9	4.5	4.3	5.8	6.9	3.6	2.1	4.4	6.0	2.7	1.0	.3	<.05	<.05	.2
8-79	7.3	8.9	4.8	3.1	6.6	8.5	4.6	2.1	8.1	9.9	4.8	2.9	6.5	8.9	3.8	2.1	.4	<.05	<.05	<.05
9-79	7.5	9.9	4.8	5.9	6.6	9.3	4.7	4.4	6.4	7.3	4.5	2.3	4.6	5.7	2.9	1.3	.5	<.05	.4	.7
10-79	10.5	9.9	4.6	27.1	9.5	9.6	4.5	23.2	6.6	8.1	4.3	3.3	5.3	6.8	3.4	2.6	.2	<.05	.1	<.05
11-79	5.9	7.8	4.1	2.1	5.3	7.5	3.9	1.3	5.7	6.7	3.8	2.7	4.2	5.4	2.2	1.8	.5	<.05	6	5

1978 Benchmarks

TULSA LABOR TURNOVER RATES IN MFG (per 100 employees)

Date	Accession Rates				Separation Rates			
	Total		New Hires		Total		Quits	
	Total Mfg	Trans Equip	Total Mfg	Trans Equip	Total Mfg	Trans Equip	Total Mfg	Trans Equip
12-77								
1-78	5.3	3.0	5.0	2.5	5.1	4.7	3.1	2.0
2-78	5.0	3.5	4.5	2.9	5.8	4.0	3.3	1.7
3-78	6.0	2.4	5.5	2.1	6.4	7.9	3.7	2.0
4-78	6.8	4.2	5.7	2.7	6.4	4.9	4.1	2.6
5-78	7.3	5.0	6.4	3.2	5.9	2.0	4.0	1.2
6-78	6.8	4.7	6.2	3.3	5.8	2.4	4.3	1.7
7-78	7.3	5.6	6.8	4.2	7.0	2.6	5.0	1.4
8-78	8.6	5.1	7.6	4.1	8.8	1.9	6.7	1.4
9-78	7.5	5.9	7.0	4.8	7.3	2.2	4.9	1.5
10-78	7.3	5.7	6.8	4.7	6.1	2.2	4.2	1.5
11-78	5.5	3.2	5.1	2.7	6.2	1.8	4.2	1.4
12-78	4.2	1.6	3.9	1.5	4.9	1.3	3.0	.7
1-79	6.7	6.0	6.0	5.0	5.5	2.1	3.4	1.2
2-79	6.5	6.6	6.1	5.6	5.2	1.8	3.4	1.1
3-79	6.2	5.2	5.7	4.4	6.1	2.8	4.1	2.0
4-79	6.1	2.9	5.6	2.5	5.9	2.3	4.0	1.1
5-79	7.1	2.6	6.4	2.4	6.6	2.7	4.6	1.6
6-79	5.6	2.9	5.2	2.5	6.0	1.6	4.0	1.3
7-79	5.4	4.0	4.9	3.4	5.4	2.2	3.6	1.7
8-79	8.0	6.6	7.4	5.5	8.2	2.5	6.1	1.8
9-79	6.5	4.6	5.8	3.5	6.2	2.1	4.2	1.4
10-79	7.3	4.3	6.8	3.3	6.0	2.0	4.0	1.4
*11-79	5.1	3.7	4.7	3.3	5.1	1.5	3.1	1.0

*Preliminary

1978 Benchmarks

APPENDIX II
DELPHI QUESTIONNAIRES

ROUND I, OKLAHOMA CITY LABOR MARKET

NAME: _____

In the last few years, the Oklahoma City area has experienced the introduction of several large companies such as the General Motors Assembly Plant and Dayton Tire and Rubber. These companies have affected the economy of the Oklahoma City area in general as well as the specific effects of employing large numbers of people. A side light has been the recent unionization of some of these companies. The General Motors workers elected the United Auto Workers as their union representative in August 1979 by a vote of 1,479 for the union to 658 against. Dayton Tire and Rubber was unionized by an NLRB election in January 1980 by 33 votes. Taking this information into consideration, and with your own general knowledge, please answer the following questions. Please note: Answers can be 0%.

(1) The December 1979 unemployment rate in the Oklahoma City SMSA was 2.9%. In December 1985, the unemployment rate for the Oklahoma City SMSA will be _____ %.

(2) Due to the introduction of several large unionized companies in the Oklahoma City area, union representational elections (including both successful and unsuccessful) in Oklahoma City will increase/decrease (circle the correct) by _____ %.

(3) From May 1973-May 1975, 10% of all Oklahoma City private sector workers and 18% of Oklahoma City production workers were unionized. In 1985, _____ % of Oklahoma City private sector workers and _____ % of Oklahoma City production workers will be unionized.

(4) In 1985, what employment skills will be in short supply?

(5) In 1985, there will be a surplus of what types of employment skills?

(6) What can the Oklahoma City government or the private sector do to help these problems?

(7) In January 1980, Oklahoma City area manufacturing workers earned an average of \$7.32 an hour. Between 1980-1985, real wages (excluding for the effects of inflation) will increase/decrease (circle the correct) _____ %.

OKLAHOMA CITY LABOR MARKET, ROUND II

NAME: _____

Thank you for your decision to participate in the Delphi study on the Oklahoma City labor market. This questionnaire is based on the estimates that you and the other participants made on the questions in Round I. Your task for this round will be to reconsider your answers to the questions in Round I and to furnish some additional information concerning the basis for your estimates. Please return this questionnaire by Saturday, May 3, 1980.

(1) The December 1979 unemployment rate in the Oklahoma City SMSA was 2.9%. In December 1985, the unemployment rate for the Oklahoma City SMSA will be _____%.

Participants in Round I gave estimates ranging from 2.3% to 5.5%. The average estimate was 3.5%.

(a) Your estimate in Round I was that the unemployment rate would be _____. Please make a new estimate. (Your answer may be the same as in Round I. _____%.

(b) Briefly explain your reasons for this estimate.

(2) Due to the introduction of several large unionized companies in the Oklahoma City area, union representational elections (including both successful and unsuccessful) in Oklahoma City will increase/decrease (circle the correct) by _____.%

Estimates given by all participants ranged from decrease 5 % to increase 59 %. The average estimate was 27.5 % increase.

(a) Your estimate in Round I was that representation elections would increase/decrease by _____. Please make a new estimate. Your estimate may be the same as in Round I. Union representation elections will increase/decrease (circle the correct) by _____.%

(b) Briefly explain you reasons for this estimate.

(3) From May 1973-May 1975, 10% of all Oklahoma City private sector workers and 18% of Oklahoma City production workers were unionized. In 1985, _____% of Oklahoma City private sector workers and _____% of Oklahoma City production workers will be unionized.

Estimates concerning unionized private sector workers ranged from 15 % to 30 %. The average estimate was 20 %. Participants estimated that unionized production workers would range from 26 % to 43 %. The average estimate was 31 %.

- (a) Your estimate in Round I was that in 1985, _____% of Oklahoma City private sector workers and _____% of Oklahoma City production workers would be unionized. Please make a new estimate. Your answer may be the same as in Round I. _____% of private sector workers and _____% of production workers in Oklahoma City will be unionized by 1985.

- (b) Briefly explain your reasons for these estimates.

(4) In 1985, what employment skills will be in short supply? Participants listed the following skills: Engineers including mechanical, electrical, chemical petroleum, and nuclear; cost accountants; machinists; tool and die makers; doctors and nurses; computer programmers and technicians; electronic technicians; technical and highly skilled workers, excretaries, typists.

- (a) Your answer in Round I was:

After reconsidering your answer, in 1985, what employment skills will be in short supply? Your answer may be the same as in Round I.

- (b) Briefly, explain your reasons for the above answer.

(5) In 1985, there will be a surplus of what types of employment skills? Participants listed the following skills: teachers, assembly line workers, unskilled labor, construction workers, farm workers, aeronautical engineers.

- (a) Your answer in Round I was:

After reconsidering your answer, in 1985, there will be a surplus of what types of employment skills? Your answer may be the same as in Round I.

- (b) Briefly, explain your reasons for the above answer.

(6) In January 1980, Oklahoma area manufacturing workers earned an average of \$7.32 an hour. Between 1980-85, real wages (excluding for the effects of inflation) will increase/decrease (circle the correct) ____%.

The range of estimates from all participants was from increase 5 % to increase 62.1 %. The average estimate was increase 30.6 %.

(a) Your answer in Round I was that real wages will increase/decrease ____% between 1980 and 1985. Please make a new estimate. Your answer may be the same as in Round I. Real wages (excluding for inflation) will increase/decrease (circle the correct) ____%.

(b) Please give your reasons for the above estimate.

ROUND III, OKLAHOMA CITY LABOR MARKET

NAME: _____

This questionnaire is based on the estimates that you and the other participants made on the questions in Round II. Your task for this round will be to reconsider your answers to the questions in Round II and to furnish a final estimate.

(1) The December 1979 unemployment rate in the Oklahoma City SMSA was 2.9%. In December 1985, the unemployment rate for the Oklahoma City SMSA will be ____%.

Participants in Round II gave estimates ranging from 2.3 % to 5.5%. The average estimate was 3.5%.

(a) Your estimate in Round II was that the unemployment rate would be ____%. Please make a new estimate. (Your answer may be the same as in Round II.

(2) Due to the introduction of several large unionized companies in the Oklahoma City area, union representational elections (including both successful and unsuccessful) in Oklahoma City will increase/decrease (circle the correct) by ____%.

Estimates given by all participants ranged from decrease 5 % to increase 45 %. The average estimate was increase 24.7 %.

(a) Your estimate in Round II was that representational elections would increase/decrease by ____%. Please make a new estimate. Your estimate may be the same as in Round II. Union representational elections will increase/decrease (circle the correct) by ____%.

(3) From May 1973-May 1975, 10% of all Oklahoma City private sector workers and 18% of Oklahoma City production workers were unionized. In 1985, ____% of Oklahoma City private sector workers and ____% of Oklahoma City production workers will be unionized.

Estimates concerning unionized private sector workers ranged from 15 % to 30 % in Round II. The average estimate was 20 %. Participants estimated that unionized production workers would range from 26 % to 43 %. The average estimate was 31 %.

(a) Your estimate in Round II was that in 1985, ____% of Oklahoma City private sector workers and ____% of Oklahoma City production workers would be unionized. Please make a new estimate. Your answer may be the same as in Round II. ____% of private sector workers and ____% of production workers in Oklahoma City will be unionized by 1985.

(4) In 1985, what employment skills will be in short supply? Participants listed the following skills: Engineers including mechanical, electrical, chemical, petroleum, and nuclear; cost accountants; machinists; tool and die makers; doctors and nurses; computer programmers and technicians; electronic technicians; technical and highly skilled workers, secretaries, typists.

(a) Your answer in Round II was:

After reconsidering your answer, in 1985, what employment skills will be in short supply? Your answer may be the same as Round II.

(5) In 1985, there will be a surplus of what types of employment skills? Participants listed the following skills: teachers, assembly line workers, unskilled labor, construction workers, farm workers, aeronautical engineers.

(a) Your answer in Round II was:

After reconsidering your answer, in 1985, there will be a surplus of what types of employment skills? Your answer may be the same as in Round II.

(6) In January 1980, Oklahoma City area manufacturing workers earned an average of \$7.32 an hour. Between 1980-1985, real wages (excluding for the effects of inflation) will increase/decrease (circle the correct) _____%.

The range of estimates from all participants was from increase 5 % to increase 50 %. The average estimate was increase 32 %.

(a) Your answer in Round II was that real wages will increase/decrease _____% between 1980 and 1985. Please make a new estimate. Your answer may be the same as in Round II. Real wages (excluding for inflation) will increase/decrease (circle the correct) _____%.

VITA

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Candidate for the Degree of

Master of Business Administration

Report: SELECTED LABOR MARKET INDICATORS AND THE INTRODUCTION OF A
LARGE GENERAL MOTORS ASSEMBLY PLANT INTO THE OKLAHOMA CITY SMSA

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