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*Conceptual and Measurement Problems in Job
Vacancies: A Progress Report on the
NICB Study*

JOHN G. MYERS

NATIONAL INDUSTRIAL CONFERENCE BOARD

In June 1964, the National Industrial Conference Board began an exploratory study of the collection of job vacancy statistics. The study, financed by a grant from The Ford Foundation, will extend over an eighteen-month period. In this paper, we present a summary of what we have done in the first third of the time span.

An essential first step in exploring the feasibility of preparing a new body of statistics is to specify the possible uses of the statistics. Accordingly, we have prepared a brief list of the prospective uses of a statistical series of job vacancies, and the type of information which would be appropriate for each use. This is covered in the first section of this paper. In the second section we present a summary of the objectives of our study and a brief outline of our procedure. The remaining sections are devoted to the results we have obtained thus far. Most of them can be grouped under two headings: the definition of a vacancy and the problem of job requirements.

NOTE: The cooperation of twenty-seven firms of Rochester, New York, in a preliminary survey is gratefully acknowledged. Thanks are also due to Russell McCarthy, Executive Director of the Industrial Management Council of Rochester, for his kind assistance to this study. Daniel Creamer provided advice, guidance, and helpful criticism at all times. The tedious job of coding, editing, and tabulation of the statistical results was skillfully performed by Richard Towber. Gregory Kipnis conducted several of the interviews of employers.

*PROSPECTIVE USES OF JOB VACANCY STATISTICS AND
INFORMATION APPROPRIATE TO EACH*

1. A broad measure of excess labor demand could be used in conjunction with a measure of excess labor supply as an indicator of the level of economic activity. The total number of unfilled job vacancies, which represents the excess demand for labor, would be analogous to the number of unemployed persons in the labor force, which represents the excess supply of labor. The amount of unemployment in the economy serves as one of the guides to fiscal and monetary policy on the national level. Simultaneous readings of vacancies and unemployment would furnish a better, more sensitive guide.

2. The statistics of excess labor demand and supply would provide a measure of what has been called "maladjustment in the labor market."¹ The term "maladjustment" refers to the simultaneous existence of unfilled jobs and unemployed workers. The larger the number of unfilled jobs matched by unemployed workers, the greater the degree of maladjustment. This number would result from both frictional and structural causes. The *measure* of maladjustment, therefore, would be the smaller of the total numbers of vacancies or of unemployed persons, at a point in time, when the number of vacancies and the number of unemployed are approximately equal.² Changes in the size of this measure would aid in answering questions about structural unemployment, labor mobility, etc.

3. An analysis of the importance and specific character of structural unemployment would be aided by statistics on job vacancies

¹ J. C. R. Dow and L. A. Dicks-Mireaux, "The Excess Demand for Labour: A Study of Conditions in Great Britain, 1946-1956," *Oxford Economic Papers* (N.S.), February 1958, pp. 1-33.

² An approximation of this measure can be computed as follows. Assume that the relationship between the number of vacancies and the number of unemployed, with a constant degree of maladjustment, is a rectangular hyperbola with the axes as asymptotes and the transverse axis on the 45 degree line. The formula for this relationship will then be $c = VU$, where c is a constant, V is the number of vacancies, and U is the number of unemployed. Then the degree of maladjustment, when total vacancies and total unemployment are equal, is given by the geometric mean of the two totals, i.e., $D = \sqrt{V_t U_t}$, where D is the degree of maladjustment and U_t and V_t are the values of U and V at any point in time.

and unemployment, by occupation, region, and other characteristics.

4. Training programs, both long and short term, require accurate information on employment prospects. Job vacancy statistics classified by occupation and geographic area, together with corresponding unemployment statistics, would provide a useful guide in the planning of these programs. A persistent excess of number of vacancies over number of unemployed would furnish one indication of a shortage of workers trained in that occupation. Such information could well provide a more firm basis for planning than does information currently available.

5. Placement could be aided by job vacancy statistics in a variety of ways. First of all, the knowledge that job openings do or do not exist in substantial numbers relative to unemployment would be of value to the unemployed in their search for jobs, as well as to employers in their search for workers. The greater the occupational and geographic detail available for the vacancy and unemployment statistics, the more would placement be facilitated. The direct use of reports of job openings for placement purposes is a possibility which will, no doubt, be covered in other conference papers.

To summarize the preceding points, the first two uses could be met to a large extent by statistics on the aggregate number of job vacancies and unemployment. The other three uses would require much detail on occupation and workers' skill requirements, industry, and geographic location.

We have emphasized the necessity of using unemployment statistics in conjunction with vacancy statistics. The need for both measures in the first three uses listed above seems clear. A brief justification of our position may be appropriate for the last two uses, training and placement. Analysis of the number of vacancies alone can be quite misleading. For example, two occupations in the same labor market area might have equal numbers of vacancies yet the first have a corresponding number of unemployed and the second only half as many unemployed. In this example, the first occupation would appear to be as attractive as the second for training or placement purposes, if vacancies alone were considered, yet the second would be able to absorb an additional number of workers, while the first would not.

*OBJECTIVES OF THE NICB STUDY AND
PROCEDURAL OUTLINE*

The immediate objectives of our study are several: (1) To explore the problems of definition and measurement of job vacancy statistics for the several uses mentioned in the first section. (2) To develop new empirical data which can aid in the resolution of these problems. (3) To experiment with various survey techniques, with a view to finding efficient methods of data collection. (4) To explore the coverage of difficult areas such as independent professionals and nonprofit institutions, in order to obtain a broad measure of job vacancies. (5) To explore the collection of collateral data that might provide more insight into current labor market conditions.

Our field work is restricted to Monroe County, New York, which was coextensive, until January 1965, with the Rochester Standard Metropolitan Statistical Area and with the Rochester labor market area. This is an area with a population of 625,000 and a labor force of 290,000. The county is highly industrialized, and has many large and growing manufacturing firms and a large agricultural production as well. Rochester is a city of over 300,000 persons; it is a large shopping center and the site of a major university. The unemployment rate in Rochester is very low, 1.4 per cent of the labor force in November 1964. We would therefore expect to find a substantial number of unfilled job openings in the area; more than would be found, for the same degree of maladjustment, if the unemployment rate were higher.

Our first step was to survey the literature in order to single out those aspects of concept and measurement about which there is little information. The next step was to conduct a series of extensive interviews with twenty-seven firms (or branches of national firms with headquarters elsewhere). The interviews were designed to obtain information on the problems of concept and measurement mentioned above. Detailed statistics on the current job vacancies of these firms were also collected. An analysis of the results of the interviews and the vacancy statistics is presented in this paper. The results of the analysis have been used to plan a large sample survey, including the design of the questionnaire, the survey methods, etc.

In the second half of February 1965, a probability sample survey of 300 or more establishments will be conducted in Monroe County. This survey will be preceded by a pretest of the questionnaire and of the interview techniques, and will be followed by a quality check. The survey will be repeated twice, at three-month intervals. The questionnaire and survey techniques will be varied in accordance with experience.

DEFINING A JOB VACANCY

A decision to hire an employee is analogous in many respects to a decision to seek employment. The decision by the individual is affected by his knowledge of potential earnings and conditions of work, his expected expenses in money, time, and irksomeness in seeking work, and by the alternatives available to him. The alternatives include retaining present employment, social insurance and welfare payments, the labor force participation of other family members, nonmarket work in the house, garden, or farm, and the often ridiculed choice of leisure. The employer's decision to hire is affected by his knowledge of prospective wage and related payments, recruiting, hiring, and training costs, and by the alternatives available. The latter include retaining present employees, more or less production, overtime, incentive systems to induce greater output by present employees, varying the capital-labor ratio, and the use of contract services.

Cataloguing the influences on the job seeker and the hiring center brings out their similarities. Some concern has been expressed over the "instability" or "elusiveness" of a job vacancy as a measurable phenomenon. While a mere listing of analogies will hardly suffice to allay such fears, it may serve to indicate that the problems of identifying and counting job vacancies are not different in kind from those already encountered in measuring labor force status. Job vacancies may be more volatile than unemployment, yet our interviews suggest that the difference is easily exaggerated. Most employers understood the concept after a brief explanation and there was relatively little uncertainty regarding the number of workers sought.

An ideal definition of a job vacancy would have the following attributes: (1) The definition would be appropriate to the uses of the statistics for analysis, training, and placement discussed above. (2) The definition would be operationally efficient. It could be readily understood by employers, and accurate information which matched the definition could be obtained at reasonable cost.

A working definition will of necessity require some compromise between the requirements of each of the various uses and also between desired information and the practical problems of data gathering. In our exploratory work, we have attempted to obtain empirical information which would aid in making a good compromise.

For many analytic purposes, it is desirable that a definition of a job vacancy be chosen which is comparable with the customary definition of unemployment. This is apparent when the techniques of excess-supply—excess-demand are considered. The quantities shown by job vacancies as a measure of the excess demand for labor and the quantities shown by unemployment as a measure of the excess supply of labor should be similarly defined. The construction of a definition of job vacancies analogous with the definition of unemployment has been carefully studied by Irvin Wingard of the U.S. Bureau of Labor Statistics in an unpublished memorandum. This paper was very helpful to us in planning our exploratory work. We have singled out some of the conceptual problems for study in our interviews, which we discuss later. These include: vacancies to be filled from inside or outside the plant or firm, dual job occupancy, recruiting efforts, the duration of the vacancy, and the starting date for the prospective worker.

THE PRELIMINARY SURVEY

During September and October 1964, we conducted a series of twenty-seven interviews in which we asked firms about hiring practices, record-keeping, and the kind of information they would find useful for their own purposes. The persons interviewed were usually employment managers of large and medium-sized firms and the executive most directly associated with hiring in small firms. In

every case, we attempted to interview the person or persons who were well informed about both day-to-day hiring operations and relevant management decisions on employment. All these interviews were oral. The questionnaire used is shown in Appendix A. At the same time, we asked each of the firms for their job vacancies and workers on recall as of the date of the interview. The vacancy definition used in the preliminary survey was very broad. All workers sought from outside the firm were to be listed. Part-time and temporary jobs, as well as those with a later starting date, were included. In most cases, the information was transcribed by the interviewer on the spot. About ten firms furnished the information on current vacancies by mail. The form on which the vacancy information was collected is shown in Appendix B, together with a brief set of instructions for completing the form.

The twenty-seven firms were not selected in a random fashion, but rather on the basis of size, our acquaintance with management personnel, and industry division. Nineteen firms (or plants) had 500 or more employees; the total employment of the twenty-seven was over 73,000, or about one fourth of the total employment in Monroe County. Of the total, thirteen were in durable manufacturing, five in nondurable manufacturing, and the remainder divided about equally among public utilities, trade, finance, and services. The interviews were conducted, and the job vacancy information collected, during the months of September and October 1964. This means that some seasonal variation is present in the results. Employment was rising and unemployment falling during this period in the Rochester labor market area. Although our results cannot be taken as representative of the region, as they might be if a carefully designed probability sample had been selected, we feel that they do permit some important tentative generalizations. This is especially true owing to the paucity of data in job vacancy research in the United States.

The results may be summarized as follows. A total of 1,436 job vacancies were reported by the twenty-seven firms we interviewed, but only twenty-seven recalls (which were subsequently ignored). This total represented two vacancies for every 100 employees, which contrasts with an estimated unemployment rate of 1.4 per cent for

TABLE 1
Summary Results from Interviews, September–October, 1964

	Number of Firms (1)	Number Employed (2)	Number of Vacancies (3)	Total (col. 2 + col. 3) (4)	Vacancies as Per Cent of Total (5)
Employment size					
Under 500	8	609	9	618	1.5
500–999	5	3,383	77	3,460	2.2
1,000–2,499	7	13,143	181	13,324	1.4
2,500 and over	7	55,993	1,169	57,162	2.0
Total	27	73,128	1,436	74,564	1.9
Industry type					
Durable	13	57,053	1,196	58,249	2.1
Nondurable	5	4,482	70	4,552	1.5
Other	9	11,593	170	11,763	1.4
Total	27	73,128	1,436	74,564	1.9
Occupation					
		Number of Vacancies		Percentage Distribution	
Professional, semi- professional, managerial		657		46.3	
Clerical and sales		129		9.1	
Service		29		2.0	
Skilled		353		24.9	
Semiskilled		215		15.2	
Unskilled		35		2.5	
Subtotal		1,418		100.0	
Unclassified		18			
Total		1,436			

Monroe County in November 1964. As shown in Table 1, vacancies were relatively more numerous in durable manufacturing firms (or plants) than in other industry divisions, but did not seem to be related to size of firm in any stable fashion. Almost one half of the vacancies were for professional, semiprofessional, or managerial workers, while nearly one fourth were for skilled workers.

SOME ASPECTS OF HIRING PRACTICES RELEVANT TO JOB VACANCIES

It may be helpful to begin with a review of some of the alternatives open to an employer who has decided to recruit a worker. The employer can seek a worker for the position in which a replacement is needed or a new worker is to be added, or he can fill the

opening by transfer of a present employee and recruit for the job vacated (several transfers within the firm could occur for one vacancy). A wide range of choice is also open on the type of person sought. The amount of on-the-job training needed to equip a prospective employee to perform the work required is one aspect of the employer's choice. Another is the potential for advancement of the prospective employee. Several types of worker may be under consideration simultaneously. The employer will decide on one rather than another according to his evaluation of the worker's ability relative to the cost of obtaining his services. This practice causes difficulty when job vacancies are classified by occupation, experience, etc. (see the discussion in a later section).

Intrafirm Transfer

Promotion from within is a policy widely practiced by the twenty-seven firms we interviewed. Eighty-five per cent said that for all vacancies above the entrance level, an attempt is made to fill the vacancy from within the plant before recruiting from outside. The techniques vary widely, from formal posting and bidding for openings (generally in strongly organized plants) to a review by supervisory personnel of the abilities of present employees. Four firms, the balance of the sample responding to the question, stated that they sought to fill at least part of their vacancies from without at the same time as from within the firm. This practice could lead to instability in reported vacancies. If the position were filled from within the firm after it was reported as a vacancy, one of three consequences would likely follow: (1) the vacancy would disappear altogether; (2) the vacancy would be replaced by another vacancy, probably at a lower level of skill; or (3) the vacancy would be replaced by another vacancy, but only after some time had elapsed, so that the total number of vacancies would be reduced for a time and then increased again. The first would be likely to coincide with a reduction in total employment, the second and third with expanding or stable employment. The first of these possibilities would clearly distort a series of job vacancy statistics, while the third would make the series unstable.

We have not attempted to measure the magnitude of error in reported job vacancies which these practices would introduce. Measurement would of course be possible with a carefully designed follow-up study. It is worthwhile noting, however, that the same "errors" could flow from other sources. For example, a re-evaluation of labor requirements by management can result in the expansion or contraction of total vacancies, their redistribution by occupation, postponement of recruiting, etc. The second consequence cited above, replacement of a reported vacancy by another at a different skill level, would be the result of many placements in which the employer is willing to fill a vacancy in a number of ways, according to the aptitudes and costs of applicants.

Dual Occupancy

By analogy with an unemployed person, it has been suggested that job vacancies should be restricted to unfilled jobs, that is, jobs which are not occupied by a worker. This proposal does not have much merit in our eyes. The position may be filled while recruiting is in progress because it is essential to operations, for example; the present occupant will move to another vacant position later. Other possibilities are that a new employee will be trained by the present occupant or that the present occupant is staying with the firm until a replacement is found. The first possibility mentioned is a variation on the transfer-outside hiring problem already discussed. In the second case, it can be said that an additional vacant job exists, that of trainee. Ten of the twenty-seven firms interviewed stated that frequently workers who are leaving positions, through promotion, transfer, etc., train their replacements on the job. This practice was reported to be most common for office workers, with production workers second in frequency. Another measure of the dual occupancy problem is furnished by a classification of vacancies by new position or replacement, with the latter further classified by "worker gone" or "worker still there." Of 1,034 vacancies classified, 60 per cent were for new positions, 30 per cent for replacement-worker gone, and only 10 per cent for replacement-worker still there. The omission of vacancies that if filled would result in dual occupancy is, in our view, not defensible from the

point of view of the operations of employers, and is numerically of secondary importance.

An extension of the dual occupancy concept is found in hiring in anticipation of turnover. Eight of the twenty-seven firms stated that they followed this practice, while seventeen stated that they did not (two firms did not respond). There was no clear relationship between anticipatory hiring for this reason and size of firm (or plant). However, no firm with less than 100 employees reported this practice. Hiring in anticipation of turnover is, of course, only one aspect of manpower planning, which is likely to be found only in larger firms.

RECRUITING EFFORTS

One method of attempting to pin down job vacancies by eliminating tentative or conditional openings is to accept only those vacancies for which employers are "actively recruiting." The justification for this procedure is that employers will not incur expenses in money and time to recruit employees unless they actually have a position which they wish to fill. This line of reasoning is analogous to the restriction of the unemployed to those persons actively seeking work. In practice, very little activity will satisfy the requirement for either worker or employer. A periodic scanning of want ads will qualify an individual as unemployed, while the acceptance of employment applications will qualify a prospective position as a job vacancy.

We experimented with asking employers to indicate the hiring channels they were using to fill vacancies, as a check on active recruitment. The results of this experiment were not promising. Response tended to be mechanical or perfunctory. Further, respondents tended to give the channels they "would use" rather than those they "do use," which certainly limited the value of the check. The results of this aspect of our inquiry may be of some independent interest, however, so we present a brief summary in the following paragraphs.

In our interviews, we asked representatives of the twenty-seven firms about the hiring channels they employed, in order of im-

portance as sources of hires (Appendix A).³ As shown in Table 2, walk-in or gate hiring was most often cited as the major source of engaged workers, followed at a distance by private employment agencies, newspaper advertising, and employee referrals. Another aspect of the importance of these hiring channels is the relative frequency with which each channel is used in attempting to fill vacancies, rather than the relative importance of each channel in making an actual hire. Examples are the number of vacancies listed with the various types of employment agencies, advertised in newspapers, etc. We have obtained a measure of this aspect by asking, for each vacancy reported, the hiring channels employed, up to three in number. A tabulation of the hiring channel listed first, for each vacancy, is shown in Table 3. Walk-in or gate hiring is again the most frequently used choice for practically all occupation groups. School or college placement bureaus are next in importance, owing to the heavy use of this channel for the professional, managerial, and technical group and to the large percentage of all vacancies reported which were in those occupations. The third most important channel, in terms of first listing, is private employment agencies (second as a source of hires). If frequency of mention, regardless of order of listing, is used, we find that walk-in or gate hiring is again first in importance, followed by school or college placement bureaus and the state employment agency.

The responses to the question on the importance of hiring channels as sources of hires (Table 2) were rather impressionistic, and perhaps a great deal of importance should not be attached to them. It is interesting, nevertheless, to speculate on the reasons for the divergence between the rankings of hiring channels furnished from the two sources. One possibility is that vacancies in clerical, sales, and some blue collar jobs are filled promptly, while those in professional, technical, and highly skilled blue collar jobs are filled only after some delay. Thus, channels through which groups with short hiring periods and high turnover are obtained will have a low representation when a tabulation is made of hiring channels for unfilled vacancies at a point in time. That is to say, the difference

³ It is not the practice of large firms in the Rochester area to advertise for help in the local newspapers.

TABLE 2
*Importance of Hiring Channels as Sources of Hires,
 Ranking by Twenty-Seven Firms*

Hiring Channel	Ranking by Importance		
	First	Second	Third
A Private employment agencies	4	5	0
B Rochester Machine Industries Placement Service	2	2	1
C Executive or advanced prof. search organizations	0	0	0
D State employment agencies	3	1	7
E Schools or college placement bureaus	2	4	2
F Unions	1	1	0
G Prof. or employee associations	0	1	1
H Employer associations	0	1	2
I Newspaper advertising	3	2	1
J Other advertising (radio, TV, etc.)	0	0	1
K Walk-in, gate hiring, interviewing, file search and contact, etc.	9	5	4
L Employee referrals	3	4	3
M Other	1	0	0
Total ^a	28	26	22

^a The columns do not add to twenty-seven because some firms indicated more than one hiring channel as a first choice for a specific job, while other firms indicated only one or two choices of hiring channels instead of the requested three.

between the two sets of rankings is explained by differential turn-over rates and periods of search between the occupations hired through the various channels. Some support for this speculation can be found in the responses of a few firms to a question about the length of the hiring period or period of search (Appendix A). It was frequently mentioned that the hiring of professional workers requires a long time.

THE ELEMENT OF TIME IN JOB VACANCIES

Role in Definition of Vacancy

A person is classified as unemployed only if he has been without work for a full week and he is willing to accept employment immediately. An analogous requirement for a job vacancy would be that the employer had been recruiting for at least one week and that he would be willing for a new worker to begin work at once. In order to evaluate the relative importance of openings of less

TABLE 3
*Frequency with Which Hiring Channels Were Listed
 by Employers, Twenty-Seven Firms*
 (per cent)

Job Classification	Hiring Channel ^a													Total
	A	B	C	D	E	F	G	H	I	J	K	L		
	LISTED FIRST													
Prof., semiprof., mgr.	27.2	1.8	2.9	0.6	32.3	0	0.2	0.2	2.3	1.5	30.7	0.3	100.0	
Clerical and sales	18.6	3.1	0	4.7	2.3	0	0	0	0.8	0	69.8	0.8	100.0	
Service	0	0	0	11.5	0	0	0	0	3.8	0	84.6	0	100.0	
Skilled	0.8	19.0	0	23.8	1.4	0	0	0	14.7	0.3	39.9	0	100.0	
Semiskilled	1.4	17.7	0	11.6	1.4	0	0	0	10.2	0	57.7	0	100.0	
Unskilled	0	34.3	0	8.6	0	0	0	0	0	0	57.1	0	100.0	
Unclassified	38.9	0	0	0	0	0	0	0	5.6	0	55.6	0	100.0	
Total	15.0	9.3	1.3	8.9	15.5	0	0.1	0.1	6.4	0.8	42.4	0.2	100.0	
	LISTED IN ANY POSITION													
Prof., semiprof., mgr.	30.3	7.9	12.5	6.2	67.4	0	3.7	0.8	30.1	11.9	65.4	0.8	237.0 ^b	
Clerical and sales	35.7	6.2	2.3	56.6	38.0	0	0	0	9.3	0.8	76.7	3.1	228.7 ^b	
Service	0	0	0	96.2	0	0	0	0	84.6	0	88.5	0	269.2 ^b	
Skilled	2.8	51.8	0	45.6	3.7	9.6	0	7.6	25.8	0.8	64.0	9.9	221.8 ^b	
Semiskilled	2.8	44.0	0	38.0	5.6	7.9	1.9	6.5	10.6	0.5	77.3	16.2	211.1 ^b	
Unskilled	2.9	45.7	0	22.9	5.7	0	0	0	8.6	0	65.7	31.4	182.9 ^b	
Unclassified	41.2	0	0	5.9	0	0	0	0	47.1	0	47.1	0	141.2 ^b	
Total	18.7	24.9	5.9	27.4	36.1	3.6	1.9	2.5	25.1	5.8	68.0	6.3	226.8 ^b	

^a For identification of letters, see stub of Table 2.

^b Entries in the total column reflect variations in the number of hiring channels listed for each vacancy. If three channels had been mentioned for each vacancy, all entries in this column would be 300.0.

than one week duration and those with a later starting date, we collected pertinent information for the 1,400 job openings reported by the twenty-seven firms interviewed (Appendix B).

Nine per cent of the job openings reported were of less than one week duration, while another 9 per cent were for a later starting date (Tables 4 and 5). Since there was little overlap between these

TABLE 4
Relation of Duration and Number of Vacancies

Duration in Weeks	Number of Vacancies	Percentage Distribution
Less than 1	122	8.7
1	67	4.8
2	57	4.1
3	67	4.8
4	462	32.8
5	33	2.3
6-12	309	22.0
13	36	2.6
14-25	125	8.9
26	29	2.1
27-38	51	3.6
39	3	0.2
40-51	9	0.6
52	15	1.1
More than 52	22	1.6
Subtotal	1,407	100.0
Not available	29	
Total	1,436	

TABLE 5
*Relation of Earliest Starting Date to
Number of Vacancies*

Earliest Starting Date	Number of Vacancies	Percentage Distribution
Now	1,304	90.8
Less than 1 week	59	4.1
1 to 2 weeks	0	0
2 weeks to 3 months	73	5.1
Total	1,436	100.0

categories, 18 per cent of the 1,400 vacancies would be excluded from the total number of vacancies on these two counts. We have not done so, thus including vacancies of short duration and those for later starting dates in our definition of job vacancies. Our rea-

soning was based on the desirability of a wider measure of labor demand and on the difficulties met in obtaining accurate information necessary to the application of a more restrictive definition. On the first point (the uses of job vacancy statistics for analysis), the planning of training programs, as well as placement, may be better served if a broader definition is employed. This point seems defensible even at the expense of some divergence from strict comparability with the definition of unemployment.

Secondly, the employers we interviewed experienced much difficulty in providing information on these two aspects. In regard to duration, the precise date on which recruiting began is not easily obtainable in most employment offices; in order to provide exact information, firms would have to keep individual records for each position to be filled, rather than a statistical summary. Further, there is some ambiguity in the concept of the duration of a vacancy. Some examples we have encountered may suffice to clarify this point. A person is frequently hired on a trial basis to fill a vacancy, found unsatisfactory, and then released. For statistical purposes, the vacancy should probably date from the time the (last) trial occupant left the job. However, most employers we interviewed considered the vacancy unfilled from the date recruiting originally began.

Future starting dates for job openings seem to arise mainly for three reasons. The new worker may replace a worker scheduled to depart at a specified date in the future; for example, because the latter is retiring. Some firms have a policy of asking new workers to report only at the beginning of the week or the pay period; four of the twenty-seven firms we interviewed stated that they had such an employment policy (Appendix A). Finally, many firms operate training programs which begin on specific dates; workers hired for such training programs are often told to report at the beginning of the next training session. Many large firms recruit high-school, trade-school, and especially college graduates over a period lasting several months, to begin work shortly after graduation. Large-scale training programs start in June, as a consequence, and smaller operations in late August and February. The starting date for these positions would normally coincide with the beginning of the regularly scheduled training programs. Some of the firms we interviewed

stated that they would be willing to put trainees to work immediately, however, owing to the tightness of the labor market.

Turning to a distribution of the reported openings by starting date, we see that 4 per cent of the total were for a commencement date within a week, probably reflecting beginning-of-week or pay-period policies. Five per cent of reported openings were for jobs to begin from two weeks to three months in the future; these openings probably result from departing employees and the commencement dates of training programs (we are unable to date these openings more precisely).

Duration of Vacancy and Hard-to-Fill Jobs

The distribution of the number of vacancies by duration is of interest for analysis. The median weeks of duration for the 1,400 reported vacancies was 4.8. As shown in Table 4, 60 per cent of the vacancies were of one to three months duration, 22 per cent less than one month, and 18 per cent more than three months. The median duration was greatest for skilled workers, 8.5 weeks, followed closely by semiskilled, 7.3 weeks (Table 6). Vacancies for

TABLE 6
Vacancies: Duration Related to Occupation

Occupation Group	Duration of Vacancy (weeks)						Total	Median (weeks)
	Less Than 1	1-3	4	5-12	13-25	26 or More		
A. % DISTRIBUTION OF VACANCIES BY DURATION FOR EACH OCCUPATION								
Prof., semiprof., mgr.	7.6	2.7	58.0	14.0	10.5	7.2	100.0	4.8
Clerical and sales	3.4	52.1	23.5	15.2	1.6	4.2	100.0	2.9
Service	7.7	61.5	3.8	19.3	3.8	3.8	100.0	--
Skilled	13.8	10.5	8.4	43.7	16.2	7.5	100.0	8.5
Semiskilled	7.9	17.2	8.8	32.6	11.2	22.3	100.0	7.3
Unskilled	8.6	45.7	5.7	5.7	28.6	5.7	100.0	--
Total	8.7	13.6	32.8	24.3	11.4	9.2	100.0	4.8
B. % DISTRIBUTION OF VACANCIES BY OCCUPATION FOR EACH DURATION								
Prof., semiprof., mgr.	41.0	9.7	82.8	27.6	43.1	36.7	46.3	
Clerical and sales	3.3	33.3	6.1	5.4	1.2	3.9	9.1	
Service	1.6	9.7	0.4	1.5	0.6	0.8	2.0	
Skilled	37.7	18.8	6.1	43.8	33.8	19.5	24.9	
Semiskilled	13.9	19.9	4.1	21.0	15.0	37.5	15.2	
Unskilled	2.5	8.6	0.4	0.6	6.2	1.6	2.5	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

SOURCE: See text and Appendix B.

professional, semiprofessional, and managerial workers had a median duration just equal to the average,⁴ while openings for other occupations were generally of shorter average duration. A classification of vacancies by duration and by minimum number of years of related experience required for the job confirms the finding for skilled and semiskilled workers (Table 7). Average duration gen-

TABLE 7
Vacancies: Duration Related to Years of Experience Required

Years of Experience Required	Duration of Vacancy (weeks)						Total	Median (weeks)
	Less Than 1	1-3	4	5-12	13-25	26 or More		
A. % DISTRIBUTION OF VACANCIES BY DURATION FOR EACH YEAR OF EXPERIENCE								
Less than 1	8.6	15.7	56.5	11.6	3.3	4.2	100.0	4.5
1	5.2	30.2	9.4	43.7	6.2	5.2	100.0	5.6
2	1.4	13.7	15.1	19.8	34.2	15.8	100.0	13.0
3	36.8	5.1	1.5	19.1	20.6	16.9	100.0	7.8
4	2.4	11.9	6.0	39.2	27.4	13.1	100.0	10.7
5	0	1.8	14.3	39.3	17.9	26.8	100.0	
6 or more	0	5.7	1.3	67.1	12.7	13.3	100.0	9.8
Total	8.7	13.6	32.8	24.3	11.4	9.2	100.0	4.8
B. % DISTRIBUTION OF VACANCIES BY YEAR OF EXPERIENCE FOR EACH DURATION								
Less than 1	51.6	60.2	89.6	24.8	14.9	24.0	52.9	
1	4.1	15.2	2.0	12.2	3.7	3.9	6.3	
2	1.6	10.5	4.8	8.5	31.1	17.8	10.2	
3	41.0	3.7	0.4	7.6	17.4	17.8	9.5	
4	1.6	5.2	1.1	9.6	14.3	8.5	6.5	
5	0	0.5	1.7	6.4	6.2	11.6	3.9	
6 or more	0	4.7	0.4	30.9	12.4	16.3	10.4	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

SOURCE: See text and Appendix B.

erally increases with years of experience required. Average duration of vacancy does not vary in any systematic way with minimum number of years of schooling required (Table 8). The highest median duration is for the group of vacancies with the lowest schooling requirement, less than eight years of formal education; this again reflects the longer average duration of vacancies for skilled workers which make up over one half of those with minimal or no schooling requirement.

⁴ It should be noted that most of the vacancies in this group were at the entrance grade, requiring no experience (see Table 11). This may serve to explain part of this unexpected result.

The length of time required to fill a vacancy, or the period of search, is related to the concept of a hard-to-fill vacancy. The twenty-seven firms furnishing vacancy data were asked to indicate whether or not each vacancy was hard to fill and if so, the reason why (Appendix B). Sixty-two per cent of the vacancies were designated hard to fill (Table 9). The reasons given were not too inform-

TABLE 8
Vacancies: Duration Related to Years of Schooling Required

Years of Schooling Required	Duration of Vacancy (weeks)							Median (weeks)
	Less Than 1	1-3	4	5-12	13-25	26 or More	Total	
A. % DISTRIBUTION OF VACANCIES BY DURATION FOR EACH YEAR OF SCHOOLING								
8 or less	4.4	16.7	5.0	38.3	8.9	26.7	100.0	10.1
9 or 10	9.2	40.8	3.9	30.3	11.8	3.9	100.0	4.0
11 or 12	6.2	20.5	16.5	35.9	13.9	7.0	100.0	6.5
13 or 14	22.2	19.7	4.3	27.4	11.9	14.5	100.0	6.2
15 or 16	9.1	2.4	66.7	6.7	9.2	6.0	100.0	4.2
More than 16	0	0	0	36.4	27.3	36.4	100.0	--
Total	8.7	13.6	32.8	24.3	11.4	9.2	100.0	4.8
B. % DISTRIBUTION OF VACANCIES BY YEAR OF SCHOOLING FOR EACH DURATION								
8 or less	6.7	15.8	2.0	20.8	10.1	34.0	10.4	
9 or 10	5.9	16.3	0.7	6.9	5.7	2.1	8.1	
11 or 12	23.5	48.9	16.3	49.1	39.6	22.7	30.9	
13 or 14	21.8	12.1	1.1	9.6	8.8	12.1	9.0	
15 or 16	42.0	6.8	80.0	11.1	32.1	23.4	39.6	
More than 16	0	0	0	2.4	3.8	5.7	2.0	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

SOURCE: See text and Appendix B.

ative. "Tight labor market" and "shortage of skill" were typical answers. Vacancies designated hard to fill were not of much longer duration, 6 weeks, than those not so labeled, 4.4 weeks. The percentage of vacancies classified as hard to fill rises with duration. However, 13 per cent of the vacancies existing six months or longer were not so classified. Criteria other than duration of vacancy are obviously in use by respondents.

We explored the notion of hard-to-fill vacancies at some length with each of the twenty-seven firms interviewed (Appendix A). Some respondents stated that all jobs were hard to fill in Rochester, owing to the shortage of labor, while others stated that all those jobs requiring specific skills acquired through on-the-job training

TABLE 9
Hard-to-Fill Vacancies, by Duration of Vacancies

Duration of Vacancy (weeks)	Percentage Distribution by Duration			Percentage of Total Va- cancies by Duration		
	Hard to Fill	Not Hard to Fill	Total	Hard to Fill	Not Hard to Fill	Total
Less than 1	6.5	12.0	8.7	47.5	52.5	100.0
1 - 3	8.5	22.1	13.6	39.3	10.7	100.0
4	27.5	42.0	32.8	52.3	47.7	100.0
5 - 12	31.5	11.6	24.3	82.0	18.0	100.0
13 - 25	13.3	9.1	11.4	70.9	29.1	100.0
26 or more	12.7	3.2	9.2	86.8	13.2	100.0
Total	100.0	100.0	100.0	61.3	38.7	100.0

were hard to fill. Of the nineteen firms which had hard-to-fill vacancies, twelve stated that successful recruiting for these same occupations or positions is consistently difficult, a continuing problem. Seven firms, of eighteen responding to this question, replied that they were not recruiting for all their hard-to-fill openings, indicating some withdrawal from the market. Of the eleven continuing to recruit, eight stated that they had increased their recruiting efforts. Out of the same eleven firms, seven had raised wages for some or all their hard-to-fill openings, while three stated that they paid "prevailing wages."

A definition of "hard to fill" advanced by one employment manager was the following. If recruiting for a job is conducted through several channels, and a worker is not obtained in a "reasonable" length of time, the job is hard to fill. This definition contains elements of both cost and duration criteria, since recruiting through several channels usually raises hiring costs. Another employment manager suggested a pure cost definition. If hiring costs, employing a rather broad measure of these costs, exceed "X" per cent of one year's wage or salary, the vacancy is hard to fill. "X" would be determined by the experience of the firm and would vary with the average period of service in the job.

Two other time dimensions of job vacancies are the full-time or part-time nature and the expected duration of the job. Only 9 of the 1,436 vacancies reported were for part-time jobs. Further, all of the vacancies were for jobs expected to last more than one full week.

WORKER QUALIFICATIONS AND JOB OPENINGS

For many analytic purposes, and certainly for training and placement, it is essential to obtain detailed information on the qualifications required to fill job vacancies. The accepted method of classifying jobs is by occupation. We feel that there are weaknesses in the exclusive use of this method, both in the inability of a standard occupational grouping to indicate job requirements, and in the difficulty of obtaining adequate information to permit accurate, consistent classification of reported vacancies. We have, therefore, attempted to add two more dimensions to knowledge of job requirements. These are the minimum number of years of related experience and the minimum number of years of schooling which the employer requires of prospective employees.

One obvious difficulty with this procedure arises immediately. The three measures of worker ability—occupation, schooling, and experience—are substitutes, to some extent. Schooling and work experience are obvious examples. Insofar as occupation reflects a degree of skill, schooling may also be a substitute. Thus, an employer might be willing to hire a time-study man with a high-school education and two years of experience, or a trainee with two years of college study and no experience. Some job vacancies were reported to us in this way, and we understand that orders to employment agencies are sometimes placed as alternatives. As an admittedly arbitrary rule to classify vacancies which were reported with alternative requirements, we have used the most specific occupation and the alternative with the lower level of formal schooling.

Problems in Using Job Titles

It was asserted above that occupational classifications alone do not furnish sufficient information on job requirements. This results from the wide range of skills included under one job title. For example, the *Dictionary of Occupational Titles (DOT)*,⁵ together with the 1955 Supplement, lists over 23,000 jobs. There is

⁵ United States Employment Service, U.S. Department of Labor, *Dictionary of Occupational Titles*, Second Edition, Washington, D.C., 1949; also *Supplement 1*, March 1955.

only one job title for electrical engineer. One of the firms we interviewed, however, recruits for at least five titles for electrical engineers, reflecting differing levels of skill. Many other examples could easily be cited, including occupations in the machine trades. Further, the nature of the work performed by workers in many occupations changes over time. The occupational title is not sufficient to indicate the educational requirements which may be necessary for some of the new functions. Finally, there are a large number of "entrance" jobs, requiring no related experience, which can be easily concealed by occupational titles. These entrance jobs are readily identified when vacancies are classified by occupation and experience required.

Serious problems are encountered in translating employer or "plant" titles into a standardized occupational classification. Imprecise, vague titles (to the outsider) are used in many firms. These titles vary widely from firm to firm, may vary from plant to plant within a firm, and even vary between divisions within a plant. If a regular reporting system were in operation, persons handling the reports of a number of firms could presumably become familiar with the employer titles used. A not insignificant amount of error in classification would probably remain, however.

We tested the accuracy of our classification of several hundred job vacancies, using the *DOT*, by asking the reporting employers to review our classification. The professional, semiprofessional, and managerial classifications were found to be generally acceptable by the employers. About 25 per cent of the job vacancies in other occupational groups were considered to be incorrectly classified, however. Criticism of our classification arose from three sources. The first was pure error on our part. The second was insufficient information furnished by the employer, followed by incorrect guessing on our part. The third was disagreement with the *DOT* itself; for example, a job title might be classified as "skilled" in the *DOT*, while the employer considered it to be semiskilled. The problems encountered in classifying vacancies by occupation emphasize the desirability, in our view, of broadening the measurement of job requirements.

Minimum Schooling and Experience Requirements

In asking employers for experience and schooling requirements, we took pains to obtain minimum rather than ideal levels. This required some probing on our part, and might be difficult to carry out in a large-scale survey. The use of minimal requirements is designed expressly to avoid the setting of unrealistic requirements by employers. Job vacancy statistics classified by these minimum measures will furnish indications of experience and schooling needed to fill the jobs. They have a weakness, however, in that they will not show precise information for workers more experienced or educated than the minimums. For example, an employer seeking a machinist might be willing to hire a journeyman who had just completed his apprenticeship, but would also be willing, or might very well prefer, to hire a worker with much more skill and experience. The classification of this vacancy by the minimum levels would not furnish an accurate guide to the existence of a job opening for the more highly skilled worker. This is true, of course, because another employer asking for the same minimum requirements might not be willing to hire a more highly skilled worker. Our classifications attempt to measure only entrance requirements. Further, they tend to show who could get a job, at a point in time, rather than what employers want. A weakness of this scheme is that the experience and schooling which employers actually require move inversely with the level of unemployment; employers are less demanding as the pool of unemployed workers is reduced. Since reported figures would vary somewhat over time, this lessens the value of these two measures for training programs. On the other hand, variations over time add information on the relative tightness of the labor market.

Two additional job qualifications which we explored briefly are age and sex (Appendix A). While some employers consider age to be an important characteristic for certain jobs, the New York State law against discrimination makes it impractical, we feel, to attempt to collect vacancy data classified by age. Legal requirements on hiring according to sex are less stringent. The employers we inter-

viewed seemed willing to furnish this information and expressed interest as consumers of the statistics. We plan to ask for classification of vacancy by sex of worker on future surveys.

*PRELIMINARY SURVEY RESULTS ON JOB VACANCIES
BY OCCUPATION, EXPERIENCE, AND
SCHOOLING REQUIREMENTS*

Over one third of the 1,400 job vacancies surveyed were for professional occupations (Table 10). The occupation with the most vacancies was engineer. Openings for various types of engineer accounted for 22 per cent of all vacancies. Chemists and other physical scientists were also important, each accounting for about 5 per cent of all vacancies. Semiprofessional and managerial occupations were less well represented, accounting for only 8 per cent of all vacancies together.

Vacancies for skilled occupations were second to professionals in importance. Specific occupations in large demand were those in machine shops, electrical equipment, mechanics, and tailors, in that order. Semiskilled occupations accounted for 11 per cent of all vacancies, with machine shop activities of most importance.

The total number of vacancies in clerical and sales, service, and unskilled occupations represented only 13 per cent of all vacancies, of which more than one half were in the clerical group. This distribution reflects the industrial composition of the sample and variations in the period of search between occupations, as well as relative scarcities of workers. Further, it should again be emphasized that valid conclusions about the demand and supply situations cannot be drawn from vacancy data alone, but must be accompanied by corresponding data on unemployment.

When we asked for the experience requirements for job vacancies, the finest breakdown used was an entire year. This is deficient as a measure, particularly for those vacancies requiring some experience but less than one full year of it. When one interprets the accompanying statistics, it is important to keep in mind that the vacancies classified with an experience requirement of zero years include

TABLE 10
Number and Percentage of Vacancies, by Occupation

Major Groups and Selected Components	Number of Vacancies	Percentage Distribution
I. Professional occupations	512	36.1
Chemists	70	4.9
Engineers	315	22.2
Chemical	31	2.2
Electrical	112	7.9
Industrial	27	1.9
Mechanical	128	9.0
Physical scientists, n.e.c. (physicist, statistician, mathematician)	75	5.3
II. Semiprofessional occupations	81	5.7
Laboratory technicians and assistants	32	2.3
Semiprofessional occupations, n.e.c. (production planner, time-study man, estimator)	33	2.3
III. Managerial and official occupations	35	2.5
Junior executive	33	2.3
IV. Other professional, semiprofessional, and managerial occupations	29	2.0
V. Clerical and kindred occupations	120	8.5
General office clerks	26	1.8
VI. Sales and kindred occupations	9	0.6
VII. Service occupations (cooks, guards, janitors)	29	2.0
VIII. Skilled occupations	353	24.9
Tailors and tailoresses	34	2.4
Machinists	30	2.1
Machine shop and related occupations, n.e.c. (lathe operator, inspector, sheet-metal worker)	103	7.3
Occupations in manufacture of miscellaneous electrical equipment (assembler, planer operator, instrument maker)	68	4.8
Mechanics and repairmen, n.e.c. (maintenance man)	36	2.5
IX. Semiskilled occupations	215	15.2
Machine shop and related occupations, n.e.c. (lathe operators, assemblers)	59	4.2
Occupations in manufacture of profes- sional and scientific apparatus, n.e.c.	42	3.0
Apprentices	31	2.2
X. Unskilled occupations	35	2.5
Subtotal	1,418	100.0
XI. Unclassified	18	
Total	1,436	

NOTE: Occupations are from the *Dictionary of Occupational Titles*.

some with an actual requirement of, for example, three, six, or nine months of experience. We plan to rectify this in future surveys.

Over one half of all vacancies required no experience (strictly, less than one year), while only 30 per cent required three or more years of experience (Table 11). The skilled occupations were the only group with substantial experience requirements; the median number of years of related experience demanded was three. A few

TABLE 11
Vacancies: Occupation Related to Years of Experience Required

Occupation Group	Years of Experience Required							
	Less Than 1	1	2	3	4	5	6 or More	Total
A. % DISTRIBUTION OF VACANCIES BY YEAR OF EXPERIENCE FOR EACH OCCUPATION								
Prof., semiprof., mgr.	61.5	2.4	5.4	13.8	2.3	6.2	8.4	100.0
Clerical & sales	64.0	19.2	10.4	5.6	0.8	0	0	100.0
Service	92.3	0	3.8	0	3.8	0	0	100.0
Skilled	21.7	7.3	19.9	4.1	18.5	2.3	26.1	100.0
Semiskilled	56.9	10.9	12.3	9.5	5.2	2.8	2.4	100.0
Unskilled	97.1	2.9	0	0	0	0	0	100.0
Total	52.9	6.3	10.2	9.5	6.5	3.9	10.4	100.0
B. % DISTRIBUTION OF VACANCIES BY OCCUPATION FOR EACH YEAR OF EXPERIENCE								
Prof., semiprof., mgr.	55.0	18.0	25.0	69.2	16.5	74.5	37.3	47.3
Clerical & sales	10.8	27.0	9.0	5.3	1.1	0	0	8.9
Service	3.6	0	0.7	0	1.1	0	0	1.9
Skilled	10.0	28.1	47.2	10.5	69.2	14.5	59.3	24.3
Semiskilled	16.2	25.8	18.1	15.0	12.1	10.9	3.3	15.0
Unskilled	4.4	1.1	0	0	0	0	0	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: See text and Appendix B.

professional vacancies carried significant experience requirements; these were mostly for supervisory positions in engineering. The low average experience requirements for these vacancies reflect the professed policy of the firms of hiring at the entrance grade and promoting from within, wherever possible.

One important weakness of a system of classification by years of experience should be noted. An experience requirement is a device for measuring a skill level. The amount of skill acquired in a given period of time can, of course, vary widely. The proportion of time spent in training courses, the amount of instruction received from

supervisors and more experienced workers, and the quality of equipment used, are factors determining the "productiveness" of a worker's experience. This measurement problem is similar to that found in evaluating years of schooling.

The classification scheme by years of schooling employed in this report is not customary. The groupings are "8 or less," "9 or 10," "11 or 12," "13 or 14," "15 or 16," and "Over 16." These groupings were chosen to better show entrance requirements, as discussed above. A job vacancy classified as requiring "9 or 10 years" of schooling will not require more than two years of high school, for example. Similarly, the "13 or 14" grouping covers vacancies requiring some college training but not more than two years. Most vacancies carry schooling requirements of even numbers of years, such as 8, 10, 12, etc. However, the numbers of vacancies requiring odd numbers of years was large enough to preclude ignoring them.

A very high proportion, 40 per cent, of all vacancies were for persons with three or more years of college training (Table 12).

TABLE 12
Vacancies: Occupation Related to Years of Schooling Required

Occupation Group	Years of Schooling Required						Total
	8 or Less	9-10	11-12	13-14	15-16	Over 16	
A. % DISTRIBUTION OF VACANCIES BY YEAR OF SCHOOLING FOR EACH OCCUPATION							
Prof., semiprof., mgr.	0	0	4.6	7.2	84.0	4.3	100.0
Clerical & sales	0	2.3	74.6	17.7	5.4	0	100.0
Service	80.8	11.5	7.7	0	0	0	100.0
Skilled	20.8	8.5	54.2	15.9	0.5	0	100.0
Semiskilled	22.5	26.0	51.5	0	0	0	100.0
Unskilled	14.3	65.7	20.0	0	0	0	100.0
Total	10.4	8.1	30.9	9.0	39.6	2.0	100.0
B. % DISTRIBUTION OF VACANCIES BY OCCUPATION FOR EACH YEAR OF SCHOOLING							
Prof., semiprof., mgr.	0	0	6.9	36.7	98.4	100.0	46.3
Clerical & sales	0	2.6	22.2	18.0	1.2	0	9.1
Service	14.3	5.2	0.4	0	0	0	2.0
Skilled	51.7	27.0	45.3	45.3	0.4	0	24.9
Semiskilled	30.6	45.2	23.6	0	0	0	15.2
Unskilled	3.4	20.0	1.6	0	0	0	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: See text and Appendix B.

TABLE 13
*Vacancies: Years of Experience Related to Years of
 Schooling Required*

Years of Experience Required	Years of Schooling Required						Total
	8 or Less	9-10	11-12	13-14	15-16	More Than 16	
A. % DISTRIBUTION OF VACANCIES BY YEAR OF SCHOOLING FOR EACH YEAR OF EXPERIENCE							
Less than 1	10.6	6.9	22.0	9.1	50.7	0.8	100.0
1	12.0	1.1	70.7	12.0	4.3	0	100.0
2	10.4	4.2	59.7	6.2	19.4	0	100.0
3	15.5	2.0	8.8	20.3	53.4	0	100.0
4	12.1	13.2	50.5	8.8	15.4	0	100.0
5	14.6	6.2	10.4	6.2	56.2	6.2	100.0
6 or more	26.6	0	40.3	1.3	20.8	11.0	100.0
Total	13.1	5.4	31.0	9.2	39.4	1.8	100.0
B. % DISTRIBUTION OF VACANCIES BY YEAR OF EXPERIENCE FOR EACH YEAR OF SCHOOLING							
Less than 1	41.9	67.1	36.9	51.5	67.0	23.1	52.2
1	5.9	1.3	14.8	8.5	0.7	0	6.5
2	8.1	7.9	19.6	6.9	5.0	0	10.2
3	12.4	3.9	3.0	23.1	14.2	0	10.5
4	5.9	15.8	10.5	6.2	2.5	0	6.4
5	3.8	3.9	1.1	2.3	4.8	11.5	3.4
6 or more	22.0	0	14.1	1.5	5.7	65.4	10.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: See text and Appendix B.

These vacancies are concentrated in the professional, semiprofessional, and managerial group, of course. Only 10 per cent of all the vacancies were available to persons who had not gone beyond an eighth grade education, and only 18.5 per cent of those who had not gone beyond the tenth grade. This may point up the problem faced by the school "dropout." The outlook is worsened when the experience requirement is added, for more than one half of these vacancies, available for persons with not more than ten years schooling, require one or more years of experience (Table 13).

SOME SOURCES OF BIAS IN JOB VACANCY STATISTICS

Several sources of bias or error have been discussed in the preceding paragraphs. At this point, we wish to summarize these possible distortions and to mention briefly some others which should be noted. Some evaluation of the magnitude of the sources of bias is

also presented, when it seems warranted by the results of our study up to this time. In all these cases, the bias is that which causes the measure of vacancies to fail to correspond with the measure of unemployment, so as to make the demand function differ from the supply function.

1. If reported vacancies are to be filled from within the firm, the result will be either an overstatement of total vacancies or possibly an error in the distribution by worker qualifications. The first alternative will occur when recruiting does not commence immediately for a replacement for the transferred worker. The second will occur when recruiting for a replacement begins immediately, but at a lower level. In our opinion, the magnitudes of both types of error from this source will not be large.

2. Hiring in anticipation of turnover can inflate the number of vacancies reported. If employers begin to recruit in advance, not for present needs but rather in accordance with their experience of the length of time needed to hire workers, the total number of vacancies can be inflated, and the composition of vacancies by worker requirements distorted. Since anticipatory hiring is more likely among large firms than small, the vacancies of large firms will be exaggerated relative to those of small firms.

The inflation of the total number of vacancies results from the lack of comparability between search by employers, reflected in vacancies, and search by workers, reflected partly in unemployment. For example, an employer may begin to recruit an engineer three months before he expects to need him, because the employer knows that it takes an average of three months of search to obtain an engineer. This will appear as a job vacancy, if the employer states that he will accept an applicant immediately. However, an engineer who knows that his job will end, say, three months hence and begins to search for another job, will not be counted as unemployed even if he is willing to start work at a newly found post immediately. It is clear, therefore, that anticipatory hiring will inflate the number of job vacancies relative to the number of unemployed and, therefore, introduce a bias in that sense.

The composition of the distribution of job vacancies by occupation or other measure of skill will be distorted, in the same sense,

because anticipatory hiring will be more likely for those occupations (or skills) which have a long average period of search or for firms which are large enough to permit successful actuarial treatment of turnover. We do not have sufficient information to permit evaluation of the magnitude of these possible biases.

3. A closely related problem is concerned with recruiting school graduates. This type of recruiting usually begins in the fall of each year for college graduates. Therefore, the number of graduates needed is often determined by late summer or early fall, when recruiting begins. The number sought is reduced steadily over the year, as future graduates are "signed up." If these openings are included in the total number of vacancies, they should cause a definite seasonal variation: a large increase in vacancies around September and a gradual reduction over the year.⁶ If the openings were definitely for future occupancy, they should perhaps be excluded from the vacancy total, or at least shown separately. Most of the firms we interviewed, however, stated that they would take all the graduates, for which they were recruiting, immediately, and further noted that they do employ many persons during the year to fill these openings. The size of the total bias from this source can be large, we suspect. On the supply side, students are not likely to be classified as unemployed. The magnitude of the bias could be evaluated and an adjustment made by careful study of the time pattern in vacancies for recent graduates. Alternatively, additional labor force data could be collected to permit valid comparisons.

4. Vacancies will not be strictly comparable with unemployment unless (a) openings of less than one week duration and (b) those for later starting dates are excluded. We found that these sources of difference were not of substantial size. Further, the difficulties in obtaining accurate information necessary to make the exclusions militate against the adjustment.

5. In a tight labor market, such as the Rochester labor market area, the number of openings recruited for may exceed or fall short

⁶ This may explain the short average duration of vacancies for the professional, etc. group (Table 6). Recruiting starts around September, so most of the vacancies for college graduates were about four weeks old at the time of the survey.

of actual needs. If workers are difficult to obtain, some employers may exaggerate their requirements in response, thus inflating the total number of vacancies reported. Other employers may react by withdrawing from the market or by understating their needs, considering hiring possibilities to be hopeless. This response will tend to cause an understatement of the total number of vacancies. Analogous hypotheses have been advanced about variations in the size of the labor force in response to heavy unemployment.

We are not able to evaluate the effect of these response patterns on the total number of job vacancies, but suspect that biases from both sources can be reduced by careful questioning in the process of collecting job vacancy data from employers.

FUTURE SURVEY PLANS

It was mentioned that we plan to make three large-scale sample surveys of Monroe County in 1965. The information we shall attempt to collect, the interview techniques we employ, and the forms in which we classify the survey results have been based largely on our analysis of the preliminary interviews. We plan to visit each firm or plant in our sample, for the first survey, at least, and to attempt to obtain all information at the time of the visit. The data asked of each firm will be the total number of employees on the reference date and a list of all job vacancies. For each vacancy, we shall request the job title and the job requirements or preferences in terms of sex, experience, and schooling. We also plan to reinterview some of the firms to determine survey accuracy.

The surveys will be conducted at three-month intervals and will cover, insofar as possible, the same employers. In this way, we hope to be able to investigate the effects of variations in questionnaire and procedure; the degree of stability in the number and type of vacancies; difficulties encountered in establishing a continuing reporting system; and the costs of collecting these statistics.

We are also planning questions which will provide the basis for collecting collateral information on hiring costs and on the impact of technology on occupational requirements—subjects we hope to investigate intensively at a later point.

SUMMARY

The Conference Board's study of job vacancies is exploratory in nature, concentrating on experimentation with definitions, concepts, and data collection techniques. Field work for the study is confined to Monroe County, New York, and covers all industry divisions except agriculture and private households.

A series of exploratory interviews were conducted with twenty-seven Monroe County employers during October and November, 1964. The results of these interviews are presented in this paper. In February, May, and August, 1965, data on job vacancies and related variables will be collected from a probability sample of about 400 employers. The exploratory interviews were not drawn from a probability sample; we have not, therefore, attempted to estimate any totals or rates of job vacancies for the county. We hope to produce such estimates from the 1965 surveys.

The twenty-seven firms (or plants) surveyed in the fall of 1964 are of various sizes and from several industrial groups. However, they are of above-average size and are somewhat concentrated in durable manufacturing. The job vacancies reported represented 2 per cent of the total labor demand of these employers. Vacancies were concentrated (70 per cent) in the professional and skilled occupation groups. Vacancies for engineers alone accounted for 22 per cent of the total. A classification of vacancies by occupational title alone is inadequate for many purposes. We are therefore collecting information on other dimensions of employer requirements. A classification of vacancies by minimum years of schooling required by employers confirms the finding that many of the vacancies are for positions at an advanced level; 40 per cent require a minimum of four years of college. On-the-job experience is less in demand; over one half of the vacancies could be filled by persons with less than one year of related experience.

The average duration (median and mode) of the vacancies surveyed is four weeks. Vacancies for skilled workmen were open longest, averaging eight weeks. The duration of a vacancy is related to the notion of "hard-to-fill" jobs, which we explored in some detail. Hard-to-fill is a complex concept, related to many factors,

of which length of time required to fill a vacancy (or the period of search) is only one. The cost of hiring a new employee is an important element in determining whether or not an employer considers a vacancy hard to fill.

The definition of a job vacancy which we have employed does not correspond exactly to the standard definition of an unemployed person. The vacancy definition is more inclusive. Nine per cent of the vacancies were of less than one week's duration, while another 9 per cent were for a later starting date. A more elusive element of noncomparability is in the differing period of search. An employer will often recruit in accordance with his experience of the time required to find a worker, thus recruiting in advance of actual need. A person seeking employment, however, is only counted as unemployed if he has not worked at all during the preceding week.

The preliminary interviews described in this paper and a larger number of interviews carried out in January 1965, as a pretest of our forthcoming survey, were all conducted by visits to individual employers. In this way we obtained 100 per cent response and, we believe, accurate information. The large-scale survey in February 1965 will also be conducted by visit; the enumerator will personally complete the schedule, when possible. In the May and August 1965 surveys, we may experiment with other data collection techniques.

- b. Do you prefer them to full time workers?
 - c. Would you take full time workers if they appeared?
 - d. If answer to (c) is yes, how firm is your estimate of part time vacancies?
 - e. Is estimate based on experience?
10. *Short period workers* (one full week or less)
- a. Do you have any on your payroll now?
 - b. Is this a common practice in your plant?
 - c. Are short period jobs restricted to certain occupations? Which?
11. *Seasonal workers* (periodic, recurring employment)
- a. Do you hire workers for seasonal employment?
 - b. How far ahead of their commencement date do you start hiring?
 - c. Do you contact former employees for this work?
12. a. Do you use the Dictionary of Occupational Titles (DOT) in your plant?
- b. If so, do you use the DOT code numbers?
13. *Hard to fill vacancies*
- a. Do you consider any of your present vacancies "hard to fill"? Why? Names of jobs.
 - b. Should we define "hard to fill" jobs in our final questionnaire? That is, state criteria to distinguish "hard to fill" from other vacancies?
 - c. How many of these are continuing problems, i.e. occupations or positions for which successful recruiting is consistently difficult?
 - d. If duration of vacancy is criterion, does it vary by occupation?
 - e. Are you recruiting for all of them now?
 - f. Have you reduced your recruiting efforts for hard to fill jobs? Increased them? In what ways?
 - g. Have you increased your wage or salary offers for these jobs?
14. *Future starting date*
- a. Does your company have a policy or policies about starting dates?
 - b. Does the policy depend on occupation?
15. New employees trained by workers who are leaving position, through promotion, separation, etc. (Dual occupancy of job)
- a. Is this a frequent practice in your company?
 - b. For which occupations?
 - c. How successful are you in obtaining workers in time to learn?
16. *Transfers within plant*
- a. Do you try to fill vacancies from your own staff first, then turn to outsiders?
 - b. Or, do you recruit simultaneously from within the firm and through outside channels?

- c. Does practice vary with occupation?
 - d. What is the quantitative importance of this practice, by occupation?
17. *Laid off workers*
- a. How many persons do you have in layoff status at present?
 - b. How many of these are likely to be recalled?
18. *Recalled workers*
- a. Have you notified any of your workers on layoff to report at specific dates?
 - b. What is your time period for reporting (union contract)?
 - c. What per cent of recalled workers return?
 - d. Do you allow for "loss" in recalling and hiring?
19. *Occupational detail* in reporting job vacancies
It has been proposed that job vacancy information be collected in total on a monthly basis and with an occupational breakdown every three months. Compare this system to monthly reporting of vacancies by occupation. Would you find the detailed quarterly reporting scheme, with monthly totals
- a. just as difficult
 - b. somewhat easier
 - c. much easier than monthly reporting of full occupational detail
20. a. Do you think that the occupational mix of job vacancies changes much from month to month?
b. Do you think that quarterly reporting (along with occupational detail) would be sufficient?
21. *Time period* of vacancies
- a. Can you give an estimate of the time required to fill a job vacancy?
 - b. Do you think that quarterly reporting (along with occupation)?
 - c. How does the average length of time vary with hiring channel?
 - d. Is the average length of time larger or smaller now than one year ago?
22. *Allowance for turnover*
- a. Do you hire workers in advance of known needs in accordance with your experience with employee turnover?
 - b. How does your policy vary with occupation?
23. Are there any occupations, in your operations, for which the demand has been substantially reduced, during the last quarter, owing to (please specify occupations and reasons)
- a. Product redesign
 - b. Introduction of new machinery or techniques
 - c. Closing of department
 - d. Other reasons

APPENDIX B: JOB VACANCY REPORTING FORM
FOR SEPTEMBER-OCTOBER 1964
AND ADDITIONAL INSTRUCTIONS

NATIONAL INDUSTRIAL CONFERENCE BOARD
845 THIRD AVENUE, NEW YORK, N. Y. 10022

Inquiry on Number of Vacancies and Number of Recalls

The following pages request very detailed information on number of job vacancies, sometimes called job openings, and number of recalled workers. This request is for one time only and *will not be repeated in this detail.*

The purpose of the present, exhaustive listing is to provide answers to questions which are troubling research workers in the field of job vacancy statistics. Practically no information of this type is available at the present time. However, it is essential that this information be collected in order that an appropriate, easy to answer questionnaire on job vacancies can be designed for use in a large sample survey of employers.

Your cooperation in completing this admittedly difficult form will be most valuable and helpful to the successful completion of this study.

Instructions

1. In listing job vacancies on pages 1 and 2, please include all job openings, present and anticipated, for which you are actively recruiting employees.^a
2. Please list all vacancies on pages 1 and 2, and recalls on page 3, by occupation. For recalls, the occupation is that which the worker will perform when he begins work.
3. On page 3, please list all workers who have been recalled from layoff status, but have not yet recommenced work, that is, all persons on layoff status who have been notified to report to work at a specified future date.

^a Please include outstanding orders to temporary help service organizations (e.g., Kelly Girl Service, Inc.; Manpower, Inc.; etc.), and identify such orders by placing an asterisk (*) at the end of the job title, in column (1).

Scheduled Recalls (fixed date) for your plant as of _____ (close of business yesterday)

	Occupation (1)	Number		Date of Scheduled Recall (5)
		Permanent Full Time (2)	Part Time (3)	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

INSTRUCTIONS FOR REPORTING JOB VACANCIES

Column

- (1) Occupation--Please use plant title and/or the IMC titles from the semi-annual wage survey. If the title is an unusual one, a descriptive word or two will be appreciated.
- (2) School Years--Minimum required. Please state the absolute minimum of Formal education you require of applicants. Enter as follows:
- | | |
|--|----|
| None | 0 |
| Grammar school graduate | 8 |
| Some high school | 10 |
| High school graduate | 12 |
| Junior college, Associate degree, etc. | 14 |
| College graduate | 16 |
| Master's degree | 18 |
| Ph. D. | 20 |
- (3) Related Experience--Minimum required. Please state the absolute minimum number of years of related experience you require, 0, 1, ..., 5, ..., 10, etc.
- (4) Number Sought--Total number of workers you are seeking with given title.
- (5) to (12) Number Sought and Duration of Job--Only use appropriate columns. For example, if you are recruiting for full time permanent workers only, you will omit columns (6), (7), (8), (9), (10), and (12).
- (13) to (15) How Long Have Workers Been Sought?--Length of time you have had vacancy. In (13), show number of workers sought less than one week. In (14), the number sought one full week or more. In (15), please enter the number of weeks (as closely as you can) you have been continuously recruiting for the same vacancy. If there is more than one vacancy with different durations, please show each on a different line.
- (16 a, b, c) Hiring Channels Used--Please enter the code letter or letters (up to 3, no more is necessary) indicating the principal hiring channels you have used to seek to fill the corresponding vacancies.
- (17) and (18) Earliest Starting Date--If the vacancy is for immediate occupancy, please check column (17). If the starting date is for a later time, please enter the date in (18).
- (19), (20), (21) Replacement or New Position--For new positions, or increases in staff, enter the number sought in (21). For replacements, enter in (20) if the departing worker is still performing this job, in (19) if the departing worker has moved to another job or has left the establishment.
- (22) to (24) Hard to Fill Openings--Please indicate if you consider the vacancy hard to fill or not. If hard to fill, please state very briefly the reason for your conclusion in (24).



The Time Dimension in the Collection of Job Vacancy Data

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Job vacancy data can be sought as of the time of the interview or for a longer period as well. The former case, which typifies the current trend in the collection of such data, provides a series of discontinuous observations over time, the size of the discontinuity increasing with the interviewing interval. Such collection of data is relatively simple and inexpensive. The question arises, however, whether such discontinuities may not result in a loss of valuable information. The dangers of outright bias also cannot be ignored, in view of the fact that with a fixed interviewing interval, which is virtually certain, the same interviewing periods would always be missed.

Collection of job vacancy data on an accrual basis, covering the period from one interview to another, can remedy these deficiencies. It could, in principle, provide a valuable set of data (*ex ante* or *ex post*, depending on how they are collected) relating to labor market analysis, as well as to general economic analysis. A reliable set of *ex ante* data would be particularly useful since, as noted in the Gordon report, the value of vacancy data deteriorates rapidly with time. Because of the time involved in data collection, even vacancy information for a week ahead would lose much of its value by the time it was received by placement officials. Clearly, what is needed is information relating to current vacancies and to future vacancies

NOTE: The authors would like to express their appreciation to Eleanor Gilpatrick for constructive advice and suggestions.