SPECIAL STUDY No. 16

Mobility Behaviour in the Canadian Labour Force

by

John Vanderkamp

prepared for the
Economic Council of Canada

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CHAPTER 1

INTRODUCTION

Most labour markets are continuously subjected to pressures from a variety of sources, such as shifts in consumer purchase patterns, new developments in technology, and changes in trade regulations. These pressures may change labour requirements, thus affecting employment, skill mix, and relative wages. Because all these factors are interdependent, labour markets tend to adjust themselves so as to remain in reasonable equilibrium. That is, provided labour is sufficiently mobile, a change in relative wages occasioned by a change in requirements is likely to affect labour supply, which will in turn have an influence on wage levels.

In most labour markets the adjustment process is rather slow, presumably because, for a variety of reasons, adjustment is a costly affair. We therefore observe deficiencies such as persisting structural imbalances, rigid regional wage structures, and insufficient net outmigration from chronically depressed regions. These phenomena are socially and economically undesirable, but unfortunately we have no proven theory of the adjustment process of the labour market. In other words, we have no set of criteria by which we decide that one particular part of the process is too slow or too fast.

When citing mobility as the prime solution to adjustment problems, theorists often imply that flexibility is completely absent -- that is, that labour supplies, skill composition, and relative wages in a region are fixed over time. It is then concluded that special-interest policies, such as tariffs or import quotas on textiles, or subsidies to mines or shipyards, should be maintained because the abandonment of such policies would result in large-scale unemployment in the relevant labour markets. But most studies show that there is a great deal of natural mobility. In fact, our findings indicate that about one in four persons changes occupation, industry, or province of employment during the course of a year. To be sure, if special-interest policies were abandoned, the relevant markets would not immediately be accommodated by natural mobility flows. However, it is obvious that mobility

helps to eliminate imbalances, and to argue that labour supplies are completely fixed is simply fallacious. The fact-based analysis in this Study should lead to a better understanding of labour mobility and thus serve as a building block for the theory and policy of labour market adjustment.

In our analysis we are concerned with labour mobility in a narrower sense than is often used -- i.e., with the mobility patterns of those members of the labour force covered by unemployment insurance. We shall not be able to pay much attention to:

(a) adjustments of total labour supply through entry into, and withdrawal from, the labour force;

(b) changes in hours of work;

(c) career and labour market decisions of young persons preparing to enter the labour force; or

(d) the mobility pattern of employed persons who are not in the "insured population".

Some of these exclusions are rather artificial, but they are dictated by the statistics that were available at the time of the analysis and thus are limited by the coverage of the Unemployment Insurance Act over the sample period 1965-68. Although the new Act drastically changes the coverage, it did not come into effect until July 1, 1971. Full details of the mobility data used in the analysis is provided in Chapter 2, and the analysis itself is discussed in Chapter 3.

Chapter 4 first explores the propensity of people to move from one job to another, categorizing the labour force into "movers" and "stayers". The technique used in these calculations is then applied to determine entry into and exit from the labour force, by age-sex group.

In Chapters 5, 6, and 7, labour markets are distinguished in terms of location, occupation, and industry. Each of these major characteristics is examined to determine the nature of its influence on mobility. Since even the narrowly defined labour force in this Study is significant for policy-making purposes, the results of the analyses should be valuable inputs to decisions on future programs. Just as important, they should provide

a basis for evaluating policies now in existence. The mobility and training programs of the federal Department of Manpower and Immigration are clearly in this category. In addition, the very existence of the Canada Manpower Centres, which provide free labour market information and other services, could be considered a mobility policy. In view of the amount of federal expenditures on these programs, an evaluation of their appropriateness would be of considerable significance.

CHAPTER 2

MOBILITY DATA

The mobility data used in this Study relate to those in the labour force who are covered by unemployment insurance -- hereafter referred to as the "insured population". For the period examined -- 1965-68 -- three broad groups of labour force members were therefore excluded from our analysis: self-employed and unpaid workers, persons in some specific occupations, and persons earning a salary of more than $5,460 per year. The following table gives a rough indication of the order of magnitude of the various classes.

Table 2-1

LABOUR FORCE AND INSURED POPULATION, 1961

	Millions of Persons	
Total labour force		6.5
Self-employed persons	.9	
Unpaid family workers (including persons seeking first job)	.2	
Total wage-earners		5.4
Persons not working for wage (e.g., paid in kind)	.1	
Specific occupations (e.g., agents, civil servants, armed forces, maids, athletes, barbers, bus drivers, truck drivers, mailmen, farm labourers, and teachers)	.7	
Persons on salary exceeding $5,460	.6	
Insured population, 1961		4.0

Source: Dominion Bureau of Statistics, *1961 Census*.

After the necessary exclusions, an estimated size of the insured population emerged that was quite close to the actual figure of 4 million. It should be remembered that legislation and regulations affecting the coverage of unemployment insurance are changed from time to time, so that the rough calculations in Table 2-1 are valid only for 1961. Since that time, a number of specific occupations, such as bus drivers, barbers, and farm labourers, have become covered, and in mid-1968 the salary ceiling was raised from $5,460 to $7,800. Table 2-2 indicates the situation in 1968 after these changes are taken into account.

Table 2-2

TOTAL WAGE-EARNERS AND INSURED POPULATION, 1968

		Millions of Persons
Total wage-earners		6.5
Specific occupations (e.g., civil servants, teachers, hospital employees, and armed forces)	1.0	
Persons on salary exceeding $7,800	.2	
Insured population, 1968		5.3

Note: For 1968, there is no information on wage-earners not working for a wage. In comparing Tables 2-1 and 2-2, it should be noted that the categories of "specific occupations" and "above salary ceiling" are not mutually exclusive; i.e., persons may be excluded on both counts and the division between these two categories is therefore somewhat arbitrary.

Source: White Paper on *Unemployment Insurance in the Seventies*, presented by Bryce Mackasey (Ottawa: Information Canada, 1970).

A comparison of Tables 2-1 and 2-2 shows that the changes in unemployment insurance regulations increased the insured population as a percentage of total wage-earners from 74 per cent in 1961 to 82 per cent in 1968. With the introduction of the new Unemployment Insurance Act on July 1, 1971, coverage was extended to include virtually all wage-earners.

However, data required for this mobility study were available only for years previous to 1968, and three limitations therefore imposed by our data base must be kept in mind. First, conclusions from this Study cannot be assumed to apply to the overall labour force. For example, it is quite possible that the higher wage and salary earners excluded from the insured population were more mobile than average. Second, when we consider using data from sources other than the Unemployment Insurance Commission, such as the Census, the Labour Force Survey or the Employment and Earnings Survey, the match will be good for some occupations and industries but poor for others. For example, managerial earnings in Census reports would not be representative of managers in the insured population for whom the salary ceiling was relatively low. Other such occupations, together with industries that include only a small proportion of the insured population, are indicated in Appendix A. The third limitation stems from the sizable turnover in people covered by unemployment insurance from year to year. During the period 1965-68, about a quarter of our sample left the insured population every year, and about the

same number entered who had no record of unemployment insurance in the previous year. Since a significant number of these people must have been changing between insured and noninsured employment, the turnover of the insured population would have varied negatively with the number of people covered by the unemployment insurance regulations. Thus it is likely that the turnover declined drastically after the salary ceiling was raised in 1968.

The basic information derives from a 10 per cent sample of the insured population, selected by including only those whose social insurance number ended in 4 and counting at book renewal time -- June 1 -- in each of the years 1965, 1966, 1967, and 1968. (The actual sample is about 9.5 per cent due to a small proportion of no-response cases. Since the no-response cases are not likely to be exactly the same ones from year to year, some part of the apparent turnover of the insured population is in fact a shifting between the response and no-response groups in the 10 per cent sample.) The basic information consists of a person's age, sex, occupation, and employer, and is classified by industry, province of employment, and whether or not he is a claimant.[1] This information, supplied by the employer for all employed persons and by local unemployment insurance offices for the unemployed, or "claimants", is transferred to computer cards.

Because social insurance numbers remain the same for life, we can match cards of the same individuals for two years (June 1 in each year) to obtain information about the number of persons changing occupation, industry, or province of employment. Occupations and industries are originally coded at the three-digit level,[2] and the most

[1]The cards also provide information on marital status and local office area (the country is divided into about 200 such office areas). Neither of these two variables is thought to be usable, because recording of the marital status of women is affected by income tax considerations, and local office area designations are misleading due to head office versus establishment reporting.

[2]The three-digit classification system is used in the reports of the 1961 Census of Canada. There are 294 industries at the three-digit level (see Standard Industrial Classification Manual, DBS Catalogue No. 12-501) and 273 occupations (see Occupational Classification Manual, Census of Canada 1961, DBS Catalogue No. 12-506).

detailed mobility data available are therefore three-digit mobility matrices. These data are, however, not used in this Study since the resulting matrices would be unworkably large; with almost 300 industries at the three-digit level, the matrix would have some 80,000 elements. For our purposes we have derived so-called condensed classifications of occupations (88 groups) and industries (73 groups), as detailed in Appendix A. The term "labour market" as used in this Study refers to province of employment, industry or occupation, or some combination of these; unless otherwise specified, the terms "industry" and "occupation" relate to the condensed classification.

From the way in which the mobility information is derived, it must be clear that there is a serious chance of errors creeping in. The recording and coding is done independently for each year, so that an error in reporting or coding of occupations in 1966 (e.g., persons should have been recorded in occupation i but were put in occupation j) is likely to produce false mobility in 1966-67 (when they appear to move from j to i).[3] Moreover, all mistakes in the reporting or coding in any one year are almost bound to show up as changes in status -- i.e., mobility -- since the same mistakes about the same individuals are not likely to be made again the next year. Such errors must grossly inflate the mobility rates, and in fact it has been suspected for some time that occupational mobility rates reported for the insured population were exaggerated.[4]

In order to estimate the error rate in the occupational data, we utilize two special tabulations that take into consideration all persons who had the same occupational designation in the years 1965 and 1967 (1966 and 1968) showing, in matrix form, the occupations in which they were classified in 1966 (1967). These tabulations

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[3]The error problem is not as serious for the occupational and industrial distribution statistics of the insured population at any one of the points in time because, here, mistakes will at least partly cancel each other out.

[4]Earlier data are reported in H. F. Greenway and G. W. Wheatley, "Regional Aspects of Labour Mobility in Canada, 1956-1959" in Papers of the 1961 *C.P.S.A. Conference on Statistics*, edited by Wm. C. Hood and John A. Sawyer (Toronto: University of Toronto Press, 1963). See also *Canadian Statistical Review*, July 1960, and subsequent issues.

report the incorrect coding in 1966 and 1967 respectively, providing three assumptions are valid:

(1) all persons identified with a particular occupation in 1965 *and* 1967 (1966 *and* 1968) are correctly identified with that occupation;

(2) return mobility between occupations accounts for 10 per cent of total occupational mobility (see Appendix B); and

(3) the error rates in the subsamples are representative of the full samples.

Using the estimates of incorrect coding for 1966 and 1967, we can derive an estimate of the occupational error rate for 1966-67. This procedure for estimating the error rate is set out in detail in Appendix B.

The error rate, defined as the total number of cases in which occupational errors occur as a percentage of the persons remaining in the insured population in 1966-67, is estimated at 27.3 per cent. It is difficult to say how good the estimate is, because at present we do not have any independent information on the question. However, it appears quite clear that the errors are sufficiently serious that the original occupational mobility matrices are unusable. Therefore, in this Study, discussion of occupational mobility is restricted to broad overall mobility rates, corrected in accordance with the error rate estimate. The industrial and provincial mobility matrices are reported in Appendixes D and E respectively.

The question remains why these errors occur. It is difficult to pinpoint the exact source of the problem without a further technical examination of reporting and coding procedures. The most likely trouble spots seem to be the insufficient space allowed on the returns for occupational descriptions and the inadequate instructions issued for completing the returns,[5] with the result that different employers may use different classifications for the same occupation. If so, a change of employer is

[5]A recent investigation by the Sampling Division of Statistics Canada reveals that actual mistakes in coding occupations are of little significance, which also suggests that the errors arise from inaccurate reporting.

likely to create artificial occupational mobility, and a group with a high industrial mobility rate will have a relatively large occupational reporting error. It follows that using the same estimated error rate to produce corrected occupational mobility rates for different groups may not be fully justified.

We would make a strong plea for better statistics. The establishment of a special survey to obtain work-history information about a large number of people would be a very expensive operation. However, the basic data used in this Study would be linked with data on unemployment experience from unemployment offices and with data on income from national revenue sources. The data required are already collected for administrative purposes, and the social insurance number provides the linkage. The value of such a data base would, of course, depend on reporting and coding accuracy. The relatively small expenditure required to set up a proper reporting system for this special survey would pay off handsomely in the form of a unique collection of statistics on mobility, income, and unemployment, now that the coverage problem has been eliminated under the new Act. It is to be hoped that the statistical potentialities of the basic administrative data will be taken into account under the new arrangements. Provided proper safeguards were instituted to ensure that no information about individuals could be released, such a data base could prove of immense value for research purposes.

CHAPTER 3

OVERALL MOBILITY RATES

In this chapter we shall use overall mobility rates to describe some of the obvious patterns of mobility and characteristics of movers. For this purpose, the mobility rate is defined as the total number of persons in a particular group who moved, over a stated time period, into a different occupation (industry, or province) as a percentage of the total number of persons in that group who remained in the insured population. Although these rates do not reveal much about the *direction* of mobility flows, they do summarize, in a convenient way, the propensities of particular groups to move.

Mobility rates vary with the classification system used, as Table 3-1 shows. For example, if we use the three-digit classification of occupations -- the most detailed one available for Canada with close to 300 occupations -- mobility rates are higher than if we use a two-digit classification with 61 occupational groups. The condensed classifications in this Study (see Appendix A), which are combinations of three-digit, two-digit and even one-digit occupations and industries, yield lower mobility rates than the three-digit but higher than the two-digit classifications. Corrections are made in the occupational mobility rates by assuming that the error rate estimated for the condensed classification also applies to the other two classifications. This appears legitimate in the case of the three-digit classification, since the uncorrected mobility rates are very close, although the estimated error rate is probably somewhat high for the two-digit system.

Table 3-1

MOBILITY RATES, 1966-67

(As percentage of persons remaining in insured population)

	Three-digit	Two-digit	Condensed
Occupational mobility rate	17.4	10.8	15.6
Industrial mobility rate	23.8	20.5	21.4

Note: The same error rate is assumed in correcting occupational mobility rates for all three classifications.

The differences between corrected and uncorrected rates are striking. To make this point, Table 3-2 shows a set of mobility rates that cover all combinations of occupational, industrial, and regional mobility. It should be noted that the figures shown in Table 3-1 relate to all moves involving occupational (or industrial) changes: simple moves of occupation (or industry) only, and also multidimensional moves involving industrial (or occupational) and provincial moves. Thus the mobility rates shown above for industrial and occupational moves overlap, but Table 3-2 shows mutually exclusive categories.

Table 3-2

OVERALL MOBILITY RATES (THREE-DIGIT CLASSIFICATIONS), 1966-67

(As percentage of persons remaining in insured population)

	Uncorrected	Corrected
Moves involving:		
Occupation	23.5	4.2
Industry	7.5	10.3
Province	.7	.9
Occupation and industry	14.8	12.0
Occupation and province	.5	.3
Industry and province	.4	.5
Occupation, industry, and province	1.1	1.0
No change	51.5	70.8

Note: Here it was also assumed that the estimated occupational error rate may be applied to the three-digit classification. (For details see Appendix B.)

Table 3-2 indicates that only 29.2 per cent of those remaining in the insured population made a move of any kind in 1966-67, according to the corrected figures, compared with 48.5 per cent, using uncorrected ones. It may seem surprising that occupational errors also affect the industrial and provincial mobility rates in Table 3-2. It is, however, clear that a move involving province only will, due to an occupational error, become a move involving occupation and province. Thus these errors affect the distribution between simple and multidimensional moves, in both province and industry, but not the overall provincial and industrial mobility rates, which are 2.8 per cent and 23.8 per cent respectively, before as well as after correction. As a result, the proportion of multidimensional versus simple moves is drastically different for the two sets of figures. Quite naturally, errors in reporting and coding tend to inflate the number of simple

moves far more than they do in the case of multidimensional moves unless the true simple rates are very large.[1]

Comparison with Other Canadian Data

One important lesson learned in the previous section is that valid comparisons between different mobility data are difficult, if not impossible, to make unless definitions and classifications are identical. One study in which they were the same is presented in a 1961 paper by Greenway and Wheatley.[2] The main differences are that the G-W study used a 1 per cent sample of the insured population, instead of 10 per cent; it included only employed persons; and the overall mobility rates included intraprovincial mobility. For purposes of comparison, the earlier data are adjusted to correspond to the concepts used in the present Study. Since the earlier data were also afflicted by reporting and coding errors, the overall mobility rates for all the years are corrected by assuming that our estimated error rate for condensed occupations for 1966-67 is generally applicable. Details of the adjustments are reported in Appendix C. If the adjustments and corrections to the earlier data are appropriate, striking variations in overall mobility rates can be observed from year to year (Table 3-3). In particular, we note the low rates in the late fifties when unemployment rates had sharply increased. However, while the highest unemployment rate is associated with the lowest overall mobility rate there is no clear year-to-year correspondence between the two series. Moreover, the mobility rates of the mid-sixties appear to be somewhat lower than those prevailing in 1956 and 1958, although the unemployment levels in the two periods are similar. Thus the data are not of sufficient quality for valid inferences to be drawn.

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[1] In calculating the corrections for Table 3-2 it is assumed that the occupational errors are independent of the type of mobility flow (see Appendix B). This assumption is made of necessity, but it should be remembered that mobility flows in terms of occupation *and* industry may be subject to greater errors (see Chapter 2).

[2] For sources, see Greenway and Wheatley, *op. cit.*

Table 3-3

OVERALL MOBILITY RATES AND UNEMPLOYMENT RATES, 1952 TO 1968

(As percentages of persons remaining in insured population)

Year	Overall Mobility Rate*	Year	Unemployment Rate (Annual Average)
1952-53	32.8	1952	2.9
1953-54	32.8	1953	3.0
1954-55	35.6	1954	4.6
1955-56	39.7	1955	4.4
1956-57	34.6	1956	3.4
1957-58	29.8	1957	4.6
1958-59	17.4	1958	7.1
1959-60	22.7	1959	6.0
1965-66	31.1	1965	3.9
1966-67	29.2	1966	3.6
1967-68	26.1	1967	4.1

*Corrected and adjusted for three-digit classification.

Note: For details see Appendix C.

Four other Canadian data sources are available for interprovincial mobility, each providing us with a full mobility matrix. However, although the classification system is the same in all these sources -- consisting merely of flows between the 10 Canadian provinces -- the persons included and the time periods are different for each one. Moreover, while our data relate to province of employment, the mobility definitions of the other series are in terms of province of residence. In the following comparison of data in this Study and the other sources, we use the mobility flows between the provinces (90 observations) as percentages of the relevant population in the sending province. The different series are referred to as follows:

MIP_1, MIP_2, MIP_3 - Mobility of the insured population as defined for this Study, for 1965-66, 1966-67, and 1967-68 respectively.[3]

MIT - Mobility of the income tax population in 1964. Coverage differs from *MIP*, in that self-employed and all occupations are covered and no salary ceiling exists.

[3]The other four series are mentioned and discussed in John Vanderkamp, "Interregional Mobility in Canada: A Study of the Time Pattern of Migration", *Canadian Journal of Economics*, vol. 1 (August 1968).

MFA - Mobility of the family allowance population from June 1, 1965, to June 1, 1966. The main coverage feature of these data is that they exclude all single persons, many recently married persons, and most older families.

MCL - Mobility of the labour force, derived from the 1961 Census sample, during the period June 1, 1956, to June 1, 1961.

MLP - Mobility of the labour force population 14 years of age and over, using the sample of the Labour Force Survey, during the period October 1964 to October 1965. These data also cover all persons not in the labour force and therefore constitute the most comprehensive measure of total migration flows.

The means of the 90 observations and the total inter-provincial mobility rates are as follows:

	Means	Mobility Rate
MIP_1	.59	2.7
MIP_2	.53	2.8
MIP_3	.46	2.4
MIT	.33	1.5
MFA	.36	2.0
MCL	.69	3.8
MLP	.23	1.3

Considering the year-to-year variation in the means of the insured population (compare MIP_1 with MIP_3), the various series have fairly similar means. The *MCL* series has the largest mean and mobility rate, because it covers a five-year period, while all of the others cover only one year. The rather low mean and mobility rate of the *MLP* series may be explained because *MLP* includes persons not in the labour force who may well be less mobile.

It should be noted that the mobility rates reported in this Study (MIP_1, MIP_2 and MIP_3) are standardized in terms of the number of persons remaining in the insured population. Since about 25 per cent of the total sample leaves the insured population every year, our mobility

rates would be substantially lower if standardized in terms of the total population. For example, our 2.4 per cent provincial mobility rate for 1967-68 would only be 1.8 per cent if expressed in terms of the total sample population -- legitimate only if we could assume that those persons leaving the insured population do not move between provinces. This observation should be kept in mind when comparing the provincial mobility rates of this Study with those from other sources.[4]

As the following correlation matrix shows, two series may have different averages and still display quite similar patterns. As can be seen, there is considerable correspondence between the patterns of interprovincial migratio. displayed by the various statistics. The series that correlates least with the others is *MLP*, which covers the largest population (with the smallest sample) and is also subject to more rounding errors. In the year 1965-66 (MIP_1), the migration pattern of the insured population was somewhat different from that in the other two years. We shall have occasion to note this again in Chapter 5 below.

Table 3-4

CORRELATION MATRIX OF INTERPROVINCIAL MOBILITY SERIES

	MIP_1	MIP_2	MIP_3	*MIT*	*MFA*	*MCL*	*MLP*
MIP_1	1						
MIP_2	.81	1					
MIP_3	.91	.92	1				
MIT	.71	.89	.84	1			
MFA	.71	.89	.87	.94	1		
MCL	.67	.88	.87	.93	.96	1	
MLP	.60	.81	.79	.83	.92	.90	1

[4]For a further discussion of mobility rates, see Economic Council of Canada, *Eighth Annual Review: Design for Decision-Making* (Ottawa: Information Canada, 1971), Chapter 7. This chapter gives an interregional mobility rate for 1968-69 of 1.2 per cent; if in our case we use the same five regions (Atlantic, Quebec, Ontario, Prairies, and British Columbia) and express our total interregional mobility as a percentage of the total sample population (including exits from the insured population), we obtain a figure of 1.5 per cent for 1967-68, which is quite comparable, particularly when we remember that employment conditions generally worsened from 1967 to 1969.

International Comparisons

The problems in making international comparisons are more serious, since classifications and definitions are even less likely to be similar. For this reason, such comparisons should be treated with a great deal of scepticism. A recent U.S. study,[5] undertaken by Lowell E. Gallaway for the Social Security Administration, uses data broadly comparable to ours. These data derive from a 1 per cent sample of the wage and salary workers covered under the OASDHI (Old Age Security, Disability, and Health Insurance) program, the continuity being provided by the social insurance number. This covers about nine-tenths of U.S. wage-earners compared with our coverage of about three-quarters of Canadian wage-earners. For the United States, no occupational data are available, and we can therefore compare only industrial and regional mobility.

Using a classification system with nine broad industry groups, Gallaway finds that 24.3 per cent of U.S. workers changed their industries or major jobs between 1957 and 1960. Using the same classification system for our Canadian data, we find that the industrial mobility rate for 1966-67 is 14.4 per cent. The main difference between the two sets of data is the time period covered; for reasons to be explored in the next chapter, the mobility rate for a three-year period is typically less than double the corresponding one-year rate. In view of this, the Canadian industrial mobility rate does not appear to be significantly lower than the U.S. rate. We should remember, however, that the Canadian mobility rates during 1957-60 were probably substantially lower than for 1966-67 (see Table 3-3 above).

A different impression is conveyed when we look at the interregional mobility rates. Gallaway subdivides the United States into nine main regions and reports an interregional mobility rate of 4.1 per cent for 1957-58; over the three-year period 1957-60, the U.S. rate is 7.2 per cent. The Canadian interprovincial mobility rates are 2.7 per cent for 1965-66, 2.8 per cent for

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[5]See Lowell E. Gallaway, *Interindustry Labor Mobility in the United States 1957-1960,* Research Report No. 18 (1967), and *Geographic Labor Mobility in the United States 1957 to 1960,* Research Report No. 28 (1969), U.S. Department of Health, Education and Welfare, Social Security Administration, Office of Research and Statistics.

1966-67 and 2.4 per cent for 1967-68; over the two-year period 1965-67, the rate is 3.5 per cent. The Canadian interregional mobility rates are clearly lower than the U.S. rates, even though the U.S. regions used are far broader than Canadian provinces, and Canadian mobility rates in the late fifties would probably have been lower than in the sixties.

To check further on the conclusion that interregional mobility rates are lower in Canada than in the United States, we may compare two sets of figures from recent censuses in the two countries. In both instances, mobility refers to changes in residence of the population five years of age and over. Mobility is defined over a five-year time interval -- 1956-61 for Canada, and 1955-60 for the United States -- and the mobility rates are expressed in terms of percentages of the total populations at the end of the five-year period.

	Canada 1956-61	United States 1955-60	
	(Per cent)		
All changes of residence	42.4	47.3	
Between municipalities	17.1	17.4	(counties)
Between provinces	3.4	8.9	(states)
From abroad	3.1	1.3	

Source: *Census of Canada, 1961,* and *U.S. Census, 1960.*

All Canadian figures, with the exception of immigration, are lower than the corresponding U.S. figures. In other words, the proportion of the population that moved residence is larger for the United States than for Canada. In addition, a larger proportion moved between counties in the United States than between municipalities in Canada, even though the municipalities clearly outnumber the counties. The interstate mobility rate is two-and-a-half times the interprovincial mobility rate, confirming our earlier conclusion.

It may well be argued that interregional mobility has been less necessary in Canada because of the larger

immigrant flows in this country.[6] In other words, the necessary adjustments required by changes in the Canadian labour market are partly accomplished by appropriate immigration flows. Although a complete exploration of this question requires a complex model of the two labour markets, at a superficial level we can see that the total of interprovincial and international mobility in Canada (6.5 per cent) is still considerably less than the corresponding figure for the United States (10.2 per cent).

However, as indicated earlier, international comparisons must be viewed cautiously because of the difficulty of ensuring that definitions and classifications are identical. It is even impossible to ensure that regions correspond. For example, in Canadian-U.S. comparisons, is it appropriate to use 10 provinces versus 50 states, or should we have 5 Canadian regions versus 50 states to reflect the overall population ratio? Or should we have equal numbers of regions to reflect the total land areas?

For occupational and industrial mobility, one can -- not without effort -- employ identical classifications for different countries. However, the ranking of the various countries in terms of industrial mobility rates may be different, depending on the particular classification chosen. For example, in a broad-division industry classification, 4 out of 11 are primary industries, while in the two-digit classification, the ratio is only 10 out of 70. Thus a country with a sizable primary sector may well rank higher in terms of mobility rates, based on the division classification, than if we use the two-digit classification system. International comparisons of mobility rates may well be very interesting but they should be handled with great caution and looked at with a critical eye.

Variations, by Age and Sex

The rate at which persons leave the insured population (the exit rate) varies by age and sex groups. For females, the exit rate is somewhat higher than for males, probably largely because of the fact that females are less strongly attached to the labour force. The exit rates are highest for the youngest age groups, 14-19, in both sexes, followed closely by the 65-and-over age groups. For the 20-24 age groups, the exit rates are somewhat

[6] I am grateful to Professor Ron Shearer for making this point.

larger than for the central age groups between 25 and 64. These variations between age groups correspond quite closely to what we know about labour force attachment.

Table 3-5 reports the mobility rates of persons remaining in the insured population for the 10 age-sex groups. Occupational and industrial mobility rates are based on the three-digit classification, and we shall continue to use the assumption that the error rate obtained for the condensed occupational classifications may be applied to the three-digit classifications for 1966-67. It is also assumed that the error rate for the Canada total applies to each of the groups in the original tabulations, and we have made the appropriate corrections. The total mobility rate measures the proportion of persons who moved in 1966-67; the overall occupational, industrial, and provincial mobility rates contain substantial overlaps because of multidimensional moves.

Table 3-5

MOBILITY RATES, BY AGE-SEX GROUP, 1966-67

(Corrected three-digit classifications; percentage of persons remaining in insured population)

	14-19	20-24	25-44	45-64	65+
			Males		
All moves involving:					
Occupation	43.1	32.9	18.7	10.8	20.0
Industry	46.4	35.3	24.1	18.5	22.1
Province	4.5	5.0	2.7	1.6	1.7
Total mobility rate	56.8	45.5	30.8	21.9	31.6
			Females		
All moves involving:					
Occupation	24.6	15.5	10.6	5.4	8.5
Industry	33.1	26.3	19.2	14.9	14.4
Province	2.9	4.0	2.4	1.8	1.4
Total mobility rate	37.4	29.6	20.1	16.1	18.4

First of all we note that, on the whole, males are more mobile than females. A comparison by pairing reveals that this is true for each of the age groups for virtually all aspects of mobility shown. Second, the mobility rates decline very sharply with age up to 65, and the rate of decline with age of the various mobility rates is greater for men than for women, although the pattern is the same for both sexes. It is possible that the occupational

mobility rates of the different age and sex groups in Table 3-5 may be exaggerated because, as discussed previously, groups with high industrial mobility rates may have larger-than-average occupational reporting errors. If so, the assumption that the error rate for the Canada total also applies to each group would be unwarranted. The young age groups are affected most by this difficulty, and as a result their corrected occupational mobility rates would be overestimated, compared with the older age groups. Nevertheless, no such exaggerations are likely to be sufficiently serious to change either of the generalizations stated above.[7]

In any case, both of our general conclusions are in line with earlier findings. It is interesting to note that the various mobility rates increase again at age 65 and that provincial mobility reaches its peak in the 20-24 age groups. Broadly, mobility appears to decline with age for four reasons:

(1) For the younger age groups, mobility is partly a process for discovering the right niche in the overall labour market -- a process of finding out about their own talents and tastes, and about the various career paths that are open.

(2) As age increases, the pay-off period for a mobility decision becomes shorter.

(3) The longer the typical person has been in a particular labour market, the more he dislikes being uprooted.

(4) The longer a person is employed in a particular firm or industry, the more disadvantageous moving usually is mainly because of seniority rules in unionized firms and private pension plans, which we will look at again in a later chapter.

[7]Even if we made the extreme assumption that the error rates for the different age and sex groups varied in exactly the same way as their industrial mobility rates, the younger age groups would continue to have substantially higher occupational mobility rates than the older age groups.

Differences between Provinces

Mobility rates differ strikingly from province to province, varying between a high of about 42.3 per cent for Prince Edward Island and Newfoundland, and a low of 25.1 per cent for Nova Scotia. Table 3-6 gives the mobility rates for the various provinces in terms of persons remaining in the insured population; for the corrections, it is again assumed that the overall Canadian error rates are appropriate.

The pattern of the total mobility rates suggests that mobility is most important in provinces where declining primary industries are most prominent. Thus above-average total mobility rates are recorded not only for Prince Edward Island and Newfoundland, but also for Saskatchewan, Manitoba, and New Brunswick. The patterns of occupational and industrial mobility rates roughly correspond to this proposition. The very low mobility rates observed for Nova Scotia are somewhat of an enigma, although an active training-in-industry program in this province may be part of the reason.

Table 3-6

MOBILITY RATES, BY PROVINCE, 1966-67

(Corrected three-digit classifications; percentage of persons remaining in insured population)

	Total Mobility Rate	All Moves Involving:		
		Occupation	Industry	Province
Newfoundland	41.8	24.7	34.1	5.9
Prince Edward Island	42.3	21.1	36.4	8.3
Nova Scotia	25.1	13.9	23.2	4.5
New Brunswick	31.8	17.8	28.2	5.5
Quebec	29.5	17.6	23.3	2.1
Ontario	27.8	17.0	22.5	1.8
Manitoba	32.4	19.3	24.9	4.9
Saskatchewan	34.9	19.5	27.4	6.4
Alberta	30.0	15.1	26.3	5.3
British Columbia	28.0	16.2	24.1	2.3
Canada	29.2	17.3	23.8	2.7

The provincial out-mobility rates are probably also related to the health of primary industries. But it would appear that something else is at work here as well. The provincial mobility rates in the last column vary negatively with the sizes of the provinces, a fact that may be explained by labour market choices open to a person in a particular region. If the province is small --

e.g., in the case of Prince Edward Island -- the range of choices of occupations and industries within the province is very narrow. On the other hand, for a mobile person in Ontario there are plenty of labour markets to choose from within the province itself, thus making interprovincial movement much less important. This proposition will also be examined further in Chapter 5.

Employed and Unemployed

The differences between mobility patterns of employed and unemployed are probably the most striking of any described in this chapter. It should be noted that we consider "unemployed" only those who are claimants for unemployment insurance on June 1 of the first year. Quite clearly many people are claimants at other times of the year and not on the first of June, so we do not necessarily include all persons most affected by unemployment in our definition. As we note below, this fact may affect certain comparisons of behaviour between the claimant and employed sectors of the insured population. It is, however, reasonable to assume that our unemployed category contains a substantially larger proportion of people who are unemployed for some part of the year than is included in our employed category.

As reported in Table 3-7, the overall mobility rate is 62.7 per cent for unemployed, compared with 27.7 per cent for employed persons. Virtually every type of move is more common for unemployed than for employed. Particularly noticeable is the fact that, with 8 per cent exceptions, all moves involve a change of industry. The overall industrial mobility rate for unemployed is almost three times as high as the rate for employed, compared with a ratio of little more than 2 to 1 for overall provincial mobility. This finding is perhaps not surprising if we recall that a person who has become unemployed on June 1 of year one must return to his old employer or to another firm in the same industry by June 1 of year two in order not to be counted as industrially mobile.

The mobility rates in Table 3-7 are derived by assuming that the occupational error rate of 27.3 per cent applies to both employed and unemployed groups. As will be recalled, however, groups with high industrial mobility rates may also have larger-than-average occupational reporting errors. The implication is that the

actual difference in the occupational mobility rates of employed and unemployed might be less striking than indicated. But the qualitative conclusion that the claimants have a considerably higher occupational mobility rate than the employed is not likely to be upset in any case.[8]

Table 3-7

MOBILITY RATES FOR EMPLOYED AND UNEMPLOYED, 1966-67

(Corrected three-digit classifications; percentage of persons remaining in insured population)

	Employed (Nonclaimants)	Unemployed (Claimants)
Moves involving:		
Occupation	4.2	3.4
Industry	9.9	20.3
Province	1.0	1.5
Occupation + Industry	11.0	33.6
Occupation + Province	.2	.2
Industry + Province	.5	1.0
All three	.9	3.0
No change	72.3	37.3

Unemployment does not only encourage mobility; it also appears to discourage people from remaining in the labour force. While we cannot prove this contention directly, its validity is indicated by the exit patterns of the insured population. As Table 3-8 shows, the probability of leaving the insured population is more than twice as large for unemployed than for employed persons.[9] Moreover, those who were unemployed in the

[8]Even if the occupational error rate for the unemployed group were 50 per cent, the corrected overall occupational mobility rate for this group would still be about twice as large as for the employed group.

[9]This difference may be more marked than it normally is because of the June 1 reference date for our sample. It is generally felt that those persons still on unemployment benefits, after many claimants have returned to work in April and May, represent those with a generally more tenuous attachment to the labour force, e.g., married women and persons over age 65. For example, the percentage of females in the active-claim count during 1968 as a whole was 31.9 per cent, but on June 1, 1968, 35.4 per cent of active claimants were females. If our reference point in the year had been different, the differences between the employed and unemployed in the probabilities of leaving the insured population might well have been less dramatic than the above results show.

first year are much more likely to be unemployed in the second year than are those who are employed in year one.

Table 3-8

PROBABILITY OF CHANGING EMPLOYMENT STATUS

	Employed	Unemployed	Out of Insured Population
	Status in 1966 (Percentage of relevant 1965 status category)		
1965-66			
Status in 1965			
Employed	75.4	3.3	21.3
Unemployed	36.3	18.9	45.0
Total 1965 insured population	72.5	4.4	23.1
Not in insured population	92.6	7.4	--
	Status in 1967 (Percentage of relevant 1966 status category)		
1966-67			
Status in 1966			
Employed	73.0	4.0	23.0
Unemployed	29.1	22.7	48.4
Total 1966 insured population	70.3	5.1	24.6
Not in insured population	91.4	8.6	--
	Status in 1968 (Percentage of relevant 1967 status category)		
1967-68			
Status in 1967			
Employed	71.4	3.9	24.8
Unemployed	31.6	18.1	50.4
Total 1967 insured population	68.5	4.9	26.6
Not in insured population	90.6	9.3	--

Claimant rates for insured population (Percentage)

1965	7.4
1966	6.2
1967	7.2
1968	7.4

As for persons who entered the insured population in the second year, it is interesting to note the probability of their being unemployed in year two is about twice as

high as for employed persons. Even these statistics probably understate the probability of unemployment for new entrants, as they must have sufficient employment weeks to their credit before becoming a claimant and thus appearing as unemployed in our sample.[10]

The claimant rate for the insured population decreased from 1965 to 1966 and rose again from 1966 to 1967, as shown at the bottom of Table 3-8. When we compare the top two parts of the table, we notice that the probabilities of each of the groups changed between 1965-66 and 1966-67. For all groups, the probability of becoming unemployed in 1966-67 rose, and the probability of leaving the insured population also increased for each of the three categories. In 1968 the claimant rate was again somewhat higher, although the probabilities of becoming (or remaining) unemployed were on the whole somewhat lower for 1967-68. But the chances of leaving the insured population increased further in 1967-68 for employed as well as unemployed persons, possibly in lagged response to worsening employment conditions. The implication is that when claimant rates remain at a relatively high level for some time, an increasing number of persons decide to withdraw from the insured population, partly no doubt because some of them are no longer eligible for unemployment insurance. Analysis is complicated, however, because of changes between insurable and noninsurable employment. Certainly upward mobility is a major explanation for the large and increasing exit rates for employed workers (21.3 per cent in 1965-66, rising to 23.0 per cent in 1966-67 and 24.8 per cent in 1967-68). A major component of the leakage out of the insured population was undoubtedly salaried workers who received pay increases carrying them over the salary ceiling ($5,460 per year), above which it was not compulsory for the employee to contribute to unemployment insurance.[11] It was in reaction to this growing leakage over the salary ceiling that the federal government raised the ceiling

[10]For a much more detailed analysis of these questions, see Frank T. Denton, "A Model with Variable Transition Probabilities for Simulating Short-Run Labour Force Behaviour in Canada", unpublished working paper No. 71-16, McMaster University, Hamilton, Ontario.

[11]This represented a movement out of insured employment without an actual change of job, although it is also the case that some previously insured workers moved into specially exempted categories of employment -- e.g., teaching and most provincial civil service positions.

from $5,460 to $7,800 per year, effective June 30, 1968.[12] This occurred one month after the reference date for the 1968 data used in this Study, and the effect of this amendment is therefore not reflected in Table 3-8. Moreover, due to the fact that there is not a full response in terms of our 10 per cent sample, some of the changes between insurable and noninsurable employment are probably shifts between reporting and nonreporting employers. This means that the exit rate is an amalgam of a number of different things that are difficult to disentangle.

[12]It is estimated that the amendment brought some 300,000 to 400,000 salaried workers back into the insured population (see Chapter 2 of this Study and also Dominion Bureau of Statistics, "Statistical Report on the Operation of the Unemployment Insurance Act", Cat. No. 75-001, June 1968, Table 1, and July 1971, Table 2).

CHAPTER 4

MOVERS AND STAYERS, EXIT AND ENTRY

The decision to stay in one labour market or move to another is typically based on considerations relating to the following three factors:

(1) A person's tastes and, where relevant, those of his family. He may like or dislike certain labour markets or, more commonly, dislike the idea of moving at all, probably because of the uncertainty associated with unfamiliar labour markets. Possible determinants of his preferences are his age, family and friendship ties, and attachment to local amenities.

(2) Income and employment opportunities in the various labour markets.

(3) The barriers that need to be overcome, generally thought of as the "distance" to be moved, both literally and in terms of the difficulty involved in crossing occupational and industrial boundaries.

A person will decide to move if, in his assessment, the opportunities in the new labour market are sufficiently favourable that they more than offset the cost of, or distaste for, moving. Since we cannot measure tastes, we make the hypothesis that the chances that a typical person will move vary negatively with the "distance" to, and positively with income and employment opportunities in, another labour market. This hypothesis is used later on as a framework for the analysis of labour markets themselves.

In this chapter, we attempt to determine what proportion of the labour force is likely to move from one market to another and the reasons for movement in and out of the insured population.

Movers and Stayers

It is a well-established fact that not all members of the labour force are equally mobile. We have already seen in the previous chapter that young persons are far more mobile than older persons and that the unemployed tend to move more often than the employed. But movers and "stayers" are distinguished by more than age and employment status, as we find on further analysis of the two groups.

With the available data, it is possible to distinguish between movers and stayers only on the basis of their status during the previous year. Thus if a person moved in 1965-66, he is classified as a mover at the beginning of the year 1966-67; if a person did not move in 1965-66, he is a stayer for 1966-67. Some generalizations about the relative propensities to move of each group are possible to obtain with the aid of exit rates and mobility rates for the two-year period 1965-67. It will be realized that we cannot distinguish between voluntary and involuntary movement, and we shall use the terms "probability" and "propensity" interchangeably.

There are, however, some obstacles to overcome before we can estimate the respective propensities. The most important statistic used in this analysis is the survival ratio *SR*, which measures the proportion of the 1965 population (excluding exits) that is still in the same labour market in 1967. This *SR* contains three elements:

(1) persons who did not move into a different labour market the first year and who did not make a move during the second year;

(2) persons who during the second year made a return move to the same labour market from which they moved during the first year; and

(3) persons who left the insured population during the first year and re-entered during the second year, returning to the *same* labour market.

Our problem is that although we can say something about the probabilities by relating the mobility ratio for one year to the relevant survival ratio, the *SR*s are also affected by elements (2) and (3).

To see this more precisely, we adopt the following notation:

q_m = proportion of the population (excluding exits) classified as "movers",

q_s = proportion classified as stayers,

$$q_s + q_m = 1. \tag{4-1}$$

p_m = propensity of movers to move,

p_s = propensity of stayers to move,

k = propensity of movers to return to the same labour market,

w = number of exits from insured population returning to same labour market, expressed as percentage of persons remaining in the insured population.

$$p = (p_m + k)q_m + p_s q_s. \tag{4-2}$$

Equation (4-2) expresses the total mobility rate, p, as the weighted sum of the mobility rates of movers and stayers. We shall assume that the mobility rate remains stable from year to year, so that the annual mobility rate equals the proportion of movers, or in our formulation:

$$p = q_m. \tag{4-3}$$

With the notation adopted, we can now indicate the three components of SR:

$$SR = (1 - p_s)(1 - p) + kp + w. \tag{4-4}$$

The three components on the right-hand side of equation (4-4) represent the three elements enumerated above. The first component consists of persons who did not move during the first year $(1 - p)$ and are therefore classified as stayers for the second year, of whom $(1 - p_s)$ remain in the same labour market during the second year. The second component, kp, represents the return movers; we shall assume that $k = .1$ (see Appendix B). The third

component, w, represents the exits returning to the same labour market; $w = .024$, we shall assume, which is equivalent to assuming that 7.5 per cent of exits return to the same labour market.[1]

Accepting these assumptions, we can now derive p_s from equation (4-4) as follows:

$$p_s = 1 - \frac{SR - kp - w}{1 - p} \quad , \tag{4-5}$$

and using this, we obtain p_m from equation (4-2)

$$p_m = \frac{2p - 1 + SR - 2kp - w}{p} . \tag{4-6}$$

We may illustrate this with a simple example; for this purpose, the exits returning to the same labour market are ignored; in other words, $w = 0$. In year one, 100 persons will remain in the insured population, of whom 20 have changed labour market by year two ($p = .2$); altogether 30 are in a different labour market by year three ($SR = .7$). With $k = .1$ we can then calculate $p_s = .15$ and $p_m = .3$. Thus, of the 80 persons who did not move by year two (the stayers), only 12 moved by year three. On the other hand, of the 20 persons who moved between year one and year two, 8 persons made another move -- 6 to a different labour market, and 2 back to their year one labour market. In other words, the movers are more mobile than the stayers, but multiple moves within a two-year period count only once for the survival rate; in fact, return moves have, for obvious reasons, a completely offsetting impact on the survival rate.

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[1] We have some independent evidence which shows that, at maximum, the proportion of exits returning to the same occupation is .16; for industries, this figure also is about .16; for provinces, it is .4. The probability of persons returning to the same labour market, in every one of its three dimensions, is of course considerably smaller than any of the three figures mentioned. Assuming that the three probabilities are independent and using the mobility weights of Table 3-2, we can calculate the maximum proportion of exits returning to the same labour market in each of its dimensions to be about 10 per cent.

In 1965-66 and 1966-67, the overall mobility rate averaged 30 per cent. The survival rate for 1965-67 is estimated at 59.1 per cent of the persons remaining in the insured population.[2] From this information, we calculate the two propensities:

$$p_s = .23$$

$$p_m = .36.$$

Thus, while the statement "once a mover, always a mover" is clearly an exaggeration, it appears that for our definitions the movers are in fact more likely to move again than the stayers. Another way of putting it is to say that those who were movers last year, and as such were in a minority, would this year account for almost half of the overall mobility observed, including return movement.

It is clear from equations (4-5) and (4-6) that if our assumptions about k and w are too high, then the estimate for p_s is too large and for p_m too small. The estimated results are in fact very sensitive to the assumed values for k and w; if both are taken to be zero, then $p_s = .16$ and $p_m = .64$. Unfortunately, additional evidence is required before we can obtain more reliable estimates. And this evidence can only be derived from extensive work histories including experience in nonwork situations.

The probabilities of moving are indeed different for movers and stayers, and therefore the distinction made between them seems to be useful. But the definitions of movers and stayers that were used have their limitations. For one thing, the mover group consists of a whole spectrum of cases ranging from persons who have very low probabilities of moving to those with high probabilities. For another, although our definitions of the two groups

[2]Strictly speaking, the number of persons remaining in the insured population in 1965-66 and 1965-67 are not the same. We shall see below that a substantial proportion of persons entering the insured population in one year leave again by the next year, and those who leave may enter again in sizable numbers as well. We do not have sufficient cross-classified information to come to grips with this problem, and it will therefore be ignored by assuming that the proportion of movers leaving the insured population is the same as for the stayers.

have the obvious advantage of fitting in with available data and of being quantifiable, it would be preferable to distinguish between movers and stayers on the basis of their personal characteristics and work histories. Not only would this make for a sharper distinction between the two groups, but it would allow us to use one definition of movers for all aspects of mobility.

Exit and Entry

To begin with, we may apply the same technique of distinguishing between "movers and stayers" to the phenomena of entry into, and exit from, the insured population. In these cases, "movers" are persons who entered or left the insured population during the previous year. The assumption is that "movers" have a higher probability of changing their insured population status. Here we also are dealing with return moves, consisting of persons who left the insured population during the previous year only to re-enter during the current year. We can therefore apply the same framework and notation as was employed in the previous section. The only difference is that we do not need a separate estimate for w, which is simply ignored. Purely for illustrative purposes, we assume that k = .2 or that 20 per cent of the leavers return to the insured population in the next year. In 1965-66, the percentage of the population leaving was 23.04 per cent (i.e., p = .23). Of those in the insured population in 1965, a total of 30.7 per cent had left by 1967 (i.e., SR = .693). Again, assuming that outflow is balanced by inflow -- which is legitimate since the size of the insured population changed little over the three years -- we may use the formulas of the previous section. Thus for the value of k = .2 we obtain p_s = .16 and p_m = .27 values, meaning that the combined probability of recent entrants leaving and recent leavers re-entering the insured population is greater than the probability of a stayer leaving. Thus half the flows into and out of the insured population are accounted for by a relatively small proportion of the total. This conclusion is in line with an earlier finding that most of the gross flows into and out of the labour force are

initiated by a small group of secondary participants who do not have a strong attachment to the labour force.[3]

From the descriptions in Chapter 2, we recall that a person may leave the insured population either because he leaves the labour force or because he enters non-insurable employment; part of the latter change may in fact be the result of shifts from reporting to non-reporting employers. In the remainder of this chapter we shall analyse the factors that affect labour force behaviour and then look at the various reasons for entering noninsurable employment.

As many recent studies show, labour force behaviour is related to employment opportunities. Areas with high unemployment rates typically have low participation rates (i.e., small proportions of the population in a particular age group who are participating in the labour force). Although the exit rate among unemployed persons is very much higher than among those employed, it does not directly follow that particular areas, occupations, or industries with high unemployment rates necessarily have larger gross outflows from the labour force. We shall therefore test whether exit rates are related to unemployment rates.

The second main finding of studies of labour force behaviour is that we can separate age-sex groups into primary and secondary labour force participants. Secondary participants are those who do not have a strong attachment to the labour force. The three main groups of secondary participants are married women, young people of both sexes, and persons over 65 years of age. When general unemployment increases, participation rates in these groups typically decline. We therefore test whether

[3]See F. J. Whittingham and B. W. Wilkinson, *Work Patterns of the Canadian Population, 1964*, Special Labour Force Studies No. 2, (Ottawa: Information Canada, 1967). They also show that the number of persons participating in the labour force at some time during 1964 is almost 12 per cent greater than the annual average of the labour force for that year.

occupations and industries with relatively large proportions of secondary participants also have relatively large exit rates.[4]

Table 4-1 contains the least-squares estimates of the parameters (with standard errors in parentheses below) that relate the various independent variables to the exit rates -- all expressed as proportions of the 1966 insured population. The coefficient of determination, R^2, indicates the proportion of the total variance in exit rates across industries and occupations explained by the independent variables. As can be seen, two regressions are shown for occupational and industrial exit rates, the variable indicating the proportion of females being left out in the second set, as it proved insignificant.

Table 4-1

REGRESSIONS ON EXIT RATES

	Variables Expressed as Proportion of 1966 Insured Population						
	Constant	Younger (14-24)	Females	Claimants	Older (65+)	Number of Observations	R^2
Industry	.101 (.024)	.335 (.096)	.036 (.031)	.371 (.066)	.966 (.350)	73	.518
Occupation	.164 (.024)	.173 (.097)	.035 (.035)	.253 (.104)	.472 (.266)	88	.163
Industry	.093 (.023)	.404 (.075)	--	.353 (.064)	1.090 (.334)	73	.509
Occupation	.160 (.024)	.227 (.081)	--	.224 (.103)	.488 (.265)	88	.152

All variables have the expected positive parameters and all are significant except for the proportion of females. This is perhaps not surprising since we were unable to use as a variable the proportion of married females, who have a much weaker attachment to the labour force than unmarried women. Of particular interest is the strong effect of unemployment on exit rates: if the claimant rate increases by 10 per cent, then the exit

[4]See reference in previous footnote. See also N.H.W. Davis, *Cycles and Trends in Labour Force Participation*, Special Labour Force Studies, series B, no. 5 (Ottawa: Information Canada, 1971); P. P. Proulx, "La Variabilité Cyclique des Taux de Participation à la Main-d'oeuvre au Canada", *Canadian Journal of Economics*, vol. 2 (May 1969); R. Swidinsky, "A Note on Labour Force Participation and Unemployment", *Canadian Journal of Economics*, vol. 3 (February 1970).

rate goes up by about 3 per cent. Another finding is that the R^2 is much higher for the industrial than for the occupational exit rates, which is understandable if we remember that most exclusions from the insured population -- due to, for example, salary ceiling, self-employment or specific occupations -- have a greater impact on occupations than on industries. With at least half of the variance in exit rates unaccounted for, neither grouping is particularly well explained. When we look at the residuals of the estimating equations, we observe that industrial exit rates are grossly underestimated for air transport and for federal and provincial administration, while occupational exit rates are badly underestimated for managerial and professional occupations and for salesmen, agents, and policemen. All these underestimated cases are very much in line with what one would expect on the basis of the exclusions from the insured population (see Chapter 2). Thus managers and professionals have high exit rates because they become self-employed and because their salaries frequently go above the ceiling, and salesmen and agents are in the same position partly because some agents are specifically excluded from the insured population. We therefore conclude that, on the whole, exit rates vary on the basis of what we know about labour force behaviour and according to the reasons for entering noninsurable employment.

CHAPTER 5

INTERPROVINCIAL MOBILITY

Looking at interprovincial mobility is a bit like looking at an iceberg. Although much lies beneath the surface, at least the top provides some indication of the characteristics of the whole. For example, Greenway and Wheatley estimate that geographical mobility between local office areas is more than twice as large as interprovincial flows in the period 1957-59.[1] From the 1961 Census of Canada we learn that 45.8 per cent of all labour force members changed residence between 1956 and 1961, 18.1 per cent moved between municipalities, and 3.8 per cent moved between provinces.

Table 5-1 gives some indication of the pattern of interprovincial mobility between 1965 and 1968. The net flow pattern is a fairly familiar one -- at least for periods of economic expansion -- with British Columbia recording a large net inflow and Ontario and Alberta smaller net inflows; the other seven provinces all experienced net outflows. This pattern confirms the hypothesis that, on the whole, migrants are attracted to high-income regions. Moreover, as in the other measures of mobility, gross flows are far in excess of net flows, and there is a negative relationship between unemployment rates and migration flows. Unemployment was lowest in 1966, and the total number of migrants reached its peak in 1966-67.

The figures in Table 5-1 are derived from the interprovincial mobility matrices reported in Appendix E. It should be noted that all figures reported in Appendix E relate to the 10 per cent sample of the insured population and that all data should therefore only be considered in relation to the appropriate sample population. Gross flows in Table 5-1 obviously vary strongly with province size. In the analytical section that follows later in this chapter, we shall therefore consider migration flows in relation to the relevant population sizes.

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[1] Greenway and Wheatley, *op. cit.*

Table 5-1

INTERPROVINCIAL MOBILITY, 1965 TO 1968

	Outflows			Inflows			Total Net Inflows
	1965-66	1966-67	1967-68	1965-66	1966-67	1967-68	1965-68
Newfoundland	283	347	221	285	233	215	- 118
Prince Edward Island	143	73	71	60	132	54	- 41
Nova Scotia	467	453	413	351	402	327	- 253
New Brunswick	388	409	333	356	320	372	- 82
Quebec	1,528	1,762	1,440	1,499	1,455	1,017	- 763
Ontario	2,268	2,163	1,883	2,245	2,448	2,074	453
Manitoba	777	638	618	479	608	527	- 419
Saskatchewan	460	531	489	498	402	404	- 176
Alberta	854	845	686	758	825	885	83
British Columbia	524	687	736	1,161	1,087	1,015	1,316
Total	7,692	7,908	6,890	7,692	7,908	6,890	0

In some earlier work, attention was drawn to the phenomenon of return migration.[2] With the data used there, it was possible to obtain only an indirect estimate of the quantitative importance of return migration. With a special tabulation of our present sample, however, we can give a direct estimate of the amount of return mobility between provinces. The matrices of return migration for 1966-67 and for 1967-68 are shown in Appendix E, which is summarized in Table 5-2. These figures give the number of persons migrating from province i to j in 1965-66 (1966-67) who returned from j to i in 1966-67 (1967-68). Return mobility is therefore defined in terms of a one-year period. On average, return migrants constituted 20.8 per cent of total interprovincial migration in 1966-67 and 22.1 per cent in 1967-68. This compares with our estimate of 28.5 per cent for the period 1956-61, which was derived from relating two different data sources. Since the earlier estimate was based on a definition of

[2]See John Vanderkamp, "Inter-regional Mobility in Canada: A Study of the Time Pattern of Migration", *Canadian Journal of Economics*, vol. 1 (August 1968), and "Migration Flows and Their Determinants and the Effects of Return Migration", *Journal of Political Economy*, vol. 79 (September-October 1971).

return mobility in terms of a five-year period, it should properly be higher, and the various estimates seem quite compatible.[3]

Table 5-2 shows not only that return mobility between provinces is quantitatively important, but also that the pattern of return migration is quite different from that of the total flows. We note that British Columbia has a net outflow of return migrants; Manitoba and Saskatchewan experience virtually no net flow; and Prince Edward Island and Nova Scotia have sizable net inflows of return migrants. This pattern is understandable when we remember that regions with the largest outflows of migrants will, on average, have the largest inflows of return migrants.[4]

Table 5-2

RETURN MOBILITY BETWEEN PROVINCES

	Outflows		Inflows		Total Net Inflows
	1966-67	1967-68	1966-67	1967-68	1966-68
Newfoundland	101	48	60	42	- 46
Prince Edward Island	13	9	56	16	49
Nova Scotia	68	79	108	93	54
New Brunswick	93	70	66	86	- 11
Quebec	417	363	379	288	-113
Ontario	464	426	510	504	124
Manitoba	102	146	123	124	- 1
Saskatchewan	96	81	88	82	- 7
Alberta	151	138	148	180	39
British Columbia	137	166	104	111	- 88
Total	1,642	1,526	1,642	1,526	0

[3]Return migration is here expressed in relation to total migration. In the paper "Migration Flows and Their Determinants, and the Effects of Return Migration", return migration is usually expressed in relation to new migration (see, in particular, Appendix A of that paper). The latter figure is always larger than the former. If the proportion of new migrants returning is t, then the proportion of return migrants in terms of total migration will be $\frac{t}{1+t}$. Thus if 40 per cent of new migrants return, then an average return migration constitutes about 28.5 per cent of total migration flows.

[4]For a further analysis of these return migration data, see John Vanderkamp, "Return Migration: Its Significance and Behavior", *Western Economic Journal* (forthcoming).

The following two sections describe the regression analysis used in our interprovincial mobility estimates and discuss the implications derived from it.

Regression Analysis

Migration patterns derived from various different data sources are quite similar, as we found in Chapter 3. Therefore, findings based on our sample should be considered a useful extension of earlier empirical work based on the other sources.[5] The data we employ have one important advantage -- viz., that information relating to income and unemployment rates refers to the sample itself. To illustrate this advantage, let us take Saskatchewan as an example. Comprehensive data on earned income include farm income and thus, at least for 1965-67, give Saskatchewan a high-income level that is not necessarily relevant for the mobility behaviour of the insured population. Similarly, unemployment figures for the agricultural labour force, which are generally low, are not necessarily relevant for insured persons wishing to leave or enter Saskatchewan. The data of all independent variables used in the regression analysis are reported in Appendix F.

The central hypothesis examined in most migration studies consists of three parts. Migration (M_{ij}) is positively related to average incomes in receiving regions (Y_j), negatively related to average incomes in sending regions (Y_i), and also negatively related to distance (D). In other words, more people are attracted to a province if its average income is high, and more people want to leave provinces with low incomes. Other things being equal, fewer people move between far distant locations.

Two comments need to be made on this central hypothesis. First, many empirical workers have used the income differential ($Y_j - Y_i$) to explain migration flows, on the assumption that the positive effect of Y_j and the negative effect of Y_i are of the same size. There are

[5]See two references in footnote 2, and also Marvin McInnis, "Provincial Migration and Differential Economic Opportunity", in L. D. Stone (ed.), *Migration in Canada, Some Regional Patterns* (Ottawa: DBS Census monograph, 1970), and Thomas J. Courchene, "Inter-provincial Migration and Economic Adjustment", *Canadian Journal of Economics*, vol. 3 (November 1970).

two reasons for thinking that the negative influence of Y_i will be smaller. Both of these reasons stem from the fact that Y_i does not just represent the income opportunities of persons in province i but also tells something about their characteristics. Thus persons from a low-income region, on average, have less wealth to use in the financing of migration decisions (the wealth effect of Y_i), and their productivity is also probably lower, which means that their income opportunities elsewhere are below average (the productivity effect of Y_i). The wealth and productivity effects of Y_i are both positive, and partly offset the basic negative opportunity effect of Y_i. As a result, we may expect the total negative effect of Y_i to be smaller than the positive effect of Y_j, implying that we should not use an income differential variable, but Y_j and Y_i separately.

The second comment relates to the various roles played by the distance variable D. As a barrier to mobility, distance represents three distinct aspects:

(1) the actual cost of moving, including earnings foregone in the process;

(2) the disutility of moving, in terms of time and effort, and the disutility of leaving familiar conditions and acquaintances; and

(3) the uncertainty about income and job opportunities.

All three aspects vary with distance moved. We may therefore expect the effect of D to be quite large. Moreover, we may expect the effect of the income variables to vary with distance, particularly because uncertainty about income opportunities probably increases with distance. This suggests that we should use interaction variables such as (Y_jD) and (Y_iD), and this is taken account of in the specification.

In addition to these central variables, a number of other economic and cultural variables may influence the migration flow between Canadian provinces. First, we should include variables representing population sizes in the different provinces. The dependent variable is defined as the migration flow between two provinces as a proportion of the population in the sending province (excluding those who leave the insured population by the

next year). This migration variable, M_{ij}, may be expected to be positively related to the size of the population in the receiving province, P_j, because the larger a region, the greater the number of employment opportunities, other things equal. For this reason we shall also test whether P_i, the population size in the sending provinces, has a negative effect on M_{ij} as defined, since one may argue that mobility out of a larger region is less necessary because of a greater employment choice within such a region.

Second, we test for the importance of unemployment variables, U_i and U_j, for sending and receiving provinces respectively. If the unemployment rate in the sending province is high, more persons may be expected to leave, and if the unemployment rate in the receiving province is high, fewer people will want to move there. Thus we shall test for the positive effect of U_i and the negative effect of U_j on M_{ij}.

Third, we should include some variables relating to cultural differences between the various provinces. For this purpose we use F_i and F_j, which measure the percentage of French-speaking persons in sending and receiving provinces respectively. Both of these are expected to have a negative influence on M_{ij}. For example, persons from Quebec are less likely to move to other provinces, *ceteris paribus*, and people in other provinces are less likely to migrate to Quebec because of cultural and language differences.

The regressions are reported in Table 5-3 in the same fashion as for Table 4-1, except that the equations in Table 5-3 read vertically; the meaning of the second equation shown for 1965-66 is explained below. All the variables reported are at least significant at the 5 per cent level except the P_j variable in 1965-66. The overall explanatory power of the equation as measured by R^2 is good, considering that we are using cross-section data. For the year 1965-66, the R^2 is lower, but all of this is attributable to a single observation: in that year an unusually large number of persons in the sample left Prince Edward Island to go to Newfoundland; about two-thirds returned the next year. The second regression shown for 1965-66 is estimated with 89 observations, excluding the flow from Prince Edward Island to Newfoundland. It can be seen that the R^2 and the parameter estimates are now much more in line with the other two years.

Table 5-3

REGRESSIONS ON INTERPROVINCIAL MOBILITY

	1965-66	1965-66	1966-67	1967-68
Constant term	1.546 (1.172)	.482 (.791)	.143 (.668)	- .252 (.615)
Y_i	-1.857 (.353)	-1.345 (.241)	- .806 (.201)	- .916 (.185)
Y_j	1.997 (.400)	1.668 (.270)	1.142 (.228)	1.323 (.210)
$\sqrt{Y_i D}$	4.112 (.949)	3.230 (.641)	1.964 (.541)	2.352 (.498)
$\sqrt{Y_j D}$	-4.622 (.951)	-3.708 (.643)	-2.380 (.543)	-2.747 (.499)
F_i	- .758 (.290)	- .653 (.194)	- .577 (.165)	- .541 (.152)
F_j	-1.020 (.340)	- .927 (.227)	- .762 (.194)	- .770 (.178)
P_j	.463 (.288)	.618 (.193)	.719 (.164)	.468 (.151)
R^2	.590	.722	.726	.728
Number of Observations	90	89	90	90

Note: All variables are reported in Appendixes E and F. The dependent variable expresses migration flows as a percentage of the population in the sending province. The income variables are measured in thousands of dollars; the distance variable, in thousands of miles. The F-variables record the number of French-speaking persons as a proportion of the relevant population. P_j is measured in tens of thousands of persons.

Before arriving at the regressions shown in Table 5-3, a number of tests were performed. The most important finding was that the unemployment variables are not significant in explaining the cross-section pattern of migration flows, despite the potentially important role of unemployment as an indicator of employment opportunities and uncertainty. Although this result is in line with quite a lot of earlier work, we are using unemployment variables specific to the reference group of the sample and might have expected unemployment to show more impact. Thus we have not eliminated the basic problem -- viz., that the unemployment pattern of Canadian provinces is not easy to interpret. Two of the provinces with the highest rates of out-migration are Saskatchewan and New Brunswick, which are near the low and high ends of the unemployment spectrum respectively. Similarly, British Columbia and Ontario both experience in-migration, but British Columbia has an unemployment rate well above average and Ontario is well below average.

The effect of P_i, the size of the sending province's population, was indeed negative but not significant, and P_i is therefore excluded in the regressions shown in Table 5-3. We tested for three difference income series: (1) the average earnings of the insured population in the subsample who worked full time (i.e., 50 or more weeks in the year), which is the Y variable in the regressions reported; (2) the average earnings of all persons in the insured population in the subsample, including persons who worked for only part of the year; and (3) the average earned income per person employed, as reported in the National Accounts. All three income series are reported in Appendix F. The income series (3) gave the poorest results, which is not surprising since it is least related to the insured population. The income series (2) was, on the whole, only slightly inferior to the Y-series chosen, in terms of explanatory power, and the final results would be very similar if series (2) were substituted for (1).

There are good theoretical reasons for believing that the relationship between migration flows and the income and distance variables (Y_i, Y_j, and D) should be nonlinear. To put it simply, the effect of income opportunities is not the same regardless of distance both because of the distaste for moving over longer distances and because of the uncertainty associated with distant opportunities. That the relationship is nonlinear is strongly confirmed by the tests. The specification shown in Table 5-3, which includes two interaction variables $\sqrt{Y_iD}$ and $\sqrt{Y_jD}$, is indeed far superior to the linear case. This specification is also better, in terms of goodness of fit, than a number of other nonlinear formulations tested.[6]

Implications

Because of the interaction variables, it is not easy to see at a glance what kind of effect the income and distance variables have. To determine their effect, we may calculate partial derivatives, which measure the partial effect of a variable on migration flow while other variables remain constant. It can be seen that the partial derivatives with respect to all three variables are related to distance. We therefore show the partial effects in relation to distance for 1966-67 in

[6]For a further analysis of the question of specification, see John Vanderkamp, "Some Further Tests of the Migration Model", Department of Economics, University of Guelph, Ontario (forthcoming).

Table 5-4 with incomes at about their average level of $4,700 per year; the average distance for the 90 observations is about 1,900 miles.

This table indicates that the effect of income in the sender region Y_i is, on the whole, negative but becomes positive for long distances. This result is reasonable, since it was argued that one of the positive elements of Y_i's effect is related to the financing of migration decisions, which becomes more of a problem when long distances are involved. Moreover, as was anticipated, the positive effect of income in receiving provinces is substantially larger than the negative effect of Y_i over the whole distance range. Distance has an important negative effect on interprovincial mobility flows; this effect is more important at small distances than at large ones.

Table 5-4

PARTIAL EFFECTS OF INCOME AND DISTANCE VARIABLES ON MIGRATION FOR 1966-67 EQUATION

	Distance (miles)		
	500	2,000	3,500
Partial effect of Y_i	-.482	-.168	+.039
Partial effect of Y_j	+.749	+.368	+.119
Partial effect of D	-.639	-.318	-.241
Trade-off of Y_j for D (ratio of partial effects of D and Y_j)	+.853	+.864	2.025

The last line of Table 5-4 reports the trade-off of Y_j for D. This trade-off expresses the dollar increase in Y_j that is necessary to compensate for a one-mile increase in distance in such a way that the migration flow remains constant. At 2,000 miles this trade-off is .864, which means that an increase in distance of 100 miles requires an increase in income in the receiving province of $86 per year to maintain the same migration flow. This finding indicates that distance is indeed a very serious barrier to mobility. But while moving is an event at a point in time, income is an ongoing event. Put in other words, the move is an investment and the income increase provides the payoff on this investment over some future period. If the payoff period is 10 years

and we discount at a 10 per cent rate, then the present value of the annual income increase of $86 is about $530, which is a substantial sum considering the 100-mile increase in distance.

We do not have any estimate about the actual cost of moving. But even if the marginal costs of moving the additional 100 miles is as high as $200, the rate of return on the mobility investment would still be more than 40 per cent. It would, of course, be very interesting to obtain some statistical information on the relation between total mobility costs and distance, but such information is not likely to upset the conclusion that the rate of return to interprovincial mobility in Canada is very high.

We naturally should ask the question why, if the rate of return is so high, migration flows are not greater. The answer must be that the other aspects of distance, besides actual costs of moving, figure very large in people's minds. Thus the dislike of leaving familiar surroundings and the uncertainty about income and job opportunities in distant locations are important considerations in mobility decisions.

It is sometimes argued that the high rates of return to mobility are due to "market imperfections", and it is therefore suggested that policies be devised to influence mobility flows. This argument is likely to be at least partly fallacious. The high rates of return do not per se suggest that a subsidy to mobility is desirable. If, as has been argued here, the reasons for the high rates of return are individual preferences concerning moving and uncertainty, then subsidies are not the proper instruments to encourage mobility. However, subsidies are clearly warranted in cases of real market failure, such as:

(a) The existence of externalities that subordinate individual preferences to other people's decisions. This type of situation may be dealt with directly by a mobility policy, e.g., the relocation of whole communities from fishing ports to the larger centres of Newfoundland.

(b) Discrimination of the capital market against persons with little wealth. This may be counteracted, as was attempted in the manpower

mobility program, by making loans available for persons who wish to finance a move.

(c) Exaggeration of the uncertainty associated with income and employment due to lack of information. This problem may be directly attacked by institutions such as Canada Manpower Centres, which provide free information about job opportunities and labour market conditions.

(d) Government programs that intentionally or otherwise tend to reduce the incentive to move from a province, e.g., some federal-provincial transfers, welfare payment schemes, and unemployment insurance. If these programs provide desirable benefits, perhaps because they contribute to a more desirable distribution of income, then it may be optimal to devise a mobility subsidy program to counteract them.

While in each of these four cases of market failure a subsidy to mobility may be justified, it is difficult to estimate how large the subsidy should be. In any case, our earlier analysis suggests that we cannot gauge the success of a mobility policy simply by the apparent rate of return realized by those persons who move under the auspices of the policy. This high rate of return is at least partly attributable to the existence of human preferences related to moving and uncertainty.

CHAPTER 6

OCCUPATIONAL MOBILITY

As we have already seen, the occupational mobility data are seriously affected by reporting and coding errors. For this reason, we cannot rely on any of the occupational mobility matrices for our analysis. Therefore this chapter will only contain a brief description of some aggregate occupational mobility data.

Almost 16 per cent of the persons remaining in the insured population in 1966-67 changed their occupation. In over two-thirds of these cases the change in occupation was accompanied by a change in industry which, as we can see from Table 3-2, happens more often than vice versa. The implication is that occupational boundaries are more difficult to cross than industrial ones. This conclusion is perhaps not surprising, since occupations are more clearly distinguished on the basis of differences in skills, education, and training. It should be remembered, however, that a considerable number of occupations are industry-specific -- e.g., farm workers in agriculture, loggers in forestry, and teachers in education.

Even though occupations are more clearly demarcated, in terms of labour supply characteristics, than industries, problems obstruct the analysis of occupational mobility behaviour. Education and training may be quantifiable variables (see Appendix F), but they do not describe the only important characteristics of occupations, most of which require complex mixtures of intelligence, physical toughness, manual dexterity, personality traits, and other characteristics that are not easily quantified. Furthermore, most people who have been in an occupation for a while develop decided preferences for a narrow set of "similar" occupations -- similarity depending partly on the desires and aptitudes developed. Individual preferences are much less significant for new entrants into the labour force. All this goes to say that, while it is unfortunate that the occupational mobility matrices are unusable, they would probably be as difficult to analyse as the industrial matrices of the next chapter.

Table 6-1

PERCENTAGE CHANGES IN OCCUPATIONAL POPULATION, 1966-67

	Population Change	Net Entrants	Net Mobility
1. Managers	9.8	- 2.3	12.1
2. Professionals	2.7	2.8	- .1
3. Draughtsmen and surveyors	- 3.3	- 5.9	2.6
4. Accountants	-11.2	-14.9	3.7
5. Miscellaneous professionals	-12.5	-11.3	- 1.2
6. Science and engineering technicians	1.0	0.1	0.9
7. Other professional workers	16.0	5.3	10.7
8. Bookkeepers and cashiers	6.0	1.5	4.4
9. Office and appliance operators	9.1	2.5	6.7
10. Stock clerks and storekeepers	- 1.3	1.2	- 2.5
11. Shipping men	9.7	1.6	8.0
12. Stenographers	6.5	3.1	3.4
13. Typists and clerk-typists	- 1.1	3.9	- 5.0
14. Other clerical workers	- 3.8	0.0	- 3.8
15. Other sales workers	-10.0	- 9.6	- 0.4
16. Salesmen	- 2.8	- 9.2	6.4
17. Attendants	8.6	11.9	- 3.3
18. Sales clerks	0.3	5.2	- 4.9
19. Agents	- 7.4	-15.5	8.2
20. Police and firemen	23.9	15.8	8.1
21. Guards	11.5	- 0.2	11.7
22. Cooks and bartenders	- 1.5	- 4.4	2.9
23. Waiters	1.9	4.9	- 3.0
24. Maids and assistants	2.0	6.5	- 4.5
25. Barbers	- 0.9	- 0.6	- 0.2
26. Launderers	- 5.6	- 0.1	- 5.5
27. Janitors	- 1.3	0.2	- 1.6
28. Transportation foremen and pilots	-43.0	- 3.7	-39.3
29. Train occupations	- 4.4	3.0	- 7.4
30. Shipmen	1.3	0.8	0.5
31. Bus and taxi drivers	5.3	4.1	1.2
32. Driver salesmen	-10.4	- 3.9	- 6.6
33. Truck drivers	1.1	- 1.8	2.9
34. Miscellaneous transport and communication workers	-21.2	- 8.8	-12.4
35. Telephone operators	3.3	2.9	0.4
36. Mailmen, etc.	- 0.6	3.2	- 3.9
37. Farm occupations	258.3	209.4	48.9
38. Gardeners	- 1.0	0.0	- 1.1
39. Loggers	-11.9	- 9.9	- 2.0
40. Fishermen	-15.1	- 5.9	- 9.5
41. Miners	- 1.8	- 3.5	1.7
42. Mine labourers	10.9	5.4	5.5
43. Bakers and millers	- 3.9	2.3	- 6.2
44. Butchers	- 4.4	- 5.4	1.0

(cont'd.)

Table 6-1 (concl'd.)

	Population Change	Net Entrants	Net Mobility
45. Canners	-12.2	- 3.8	- 8.4
46. Other food processors	-13.8	- 2.6	-11.1
47. Rubber workers	- 5.2	- 3.6	- 1.6
48. Leather workers	- 4.3	2.7	- 7.0
49. Spinners and weavers	- 6.0	- 1.3	- 4.7
50. Other textile workers	- 3.2	- 2.2	- 1.0
51. Tailors and cutters	- 7.9	- 3.5	- 4.4
52. Sewers	- 7.0	- 2.0	- 5.0
53. Upholsterers	- 5.6	1.0	- 6.6
54. Carpenters	- 7.6	- 7.1	- 0.5
55. Wood machine operators	- 4.8	- 2.0	- 2.8
56. Other wood workers	-14.2	- 3.9	-10.3
57. Pulp and paper workers	- 5.2	0.6	- 5.8
58. Typesetters	- 2.5	0.6	- 3.1
59. Other printing occupations	- 3.8	- 0.6	- 3.3
60. Metal workers	- 5.4	0.9	- 6.3
61. Machinists	3.4	1.7	1.7
62. Millwrights	11.6	- 4.0	15.6
63. Fitters	- 8.5	2.0	-10.5
64. Metalworking machine operators	4.4	2.0	2.4
65. Plumbers	3.1	- 0.7	3.8
66. Sheet metal workers	8.6	2.5	6.1
67. Welders	- 0.2	- 0.6	0.4
68. Other metal workers	-14.8	1.9	-16.6
69. Car mechanics	- 1.2	- 1.5	0.3
70. Other mechanics	10.7	- 1.0	11.7
71. Electricians	3.0	1.3	1.7
72. Fitters -- electrical	- 5.9	4.9	-10.7
73. Linemen, etc.	9.5	1.0	8.5
74. Painters	0.8	- 2.4	3.2
75. Construction foremen	- 8.9	- 6.6	- 2.3
76. Bricklayers	- 6.4	- 4.2	- 2.2
77. Glass workers	-16.0	-14.7	- 1.3
78. Engine men	- 1.8	- 6.2	4.4
79. Hoist workers	4.5	- 3.3	7.9
80. Operators -- construction	11.6	0.2	11.4
81. Handlers	- 7.1	- 4.2	- 2.9
82. Longshoremen	30.7	11.3	19.4
83. Warehousemen	- 3.2	1.8	- 5.0
84. Sectionmen	3.0	3.2	- 0.2
85. Foremen	6.3	- 4.9	11.2
86. Other workers	0.0	2.5	- 2.5
87. Labourers	- 4.8	1.0	- 5.9

Note: Exact occupational classification (condensed) is reported in Appendix A.

The main occupational changes in 1966-67 are summarized in Table 6-1, with all figures expressed as percentages of the 1966 population in each of the occupations. The first column simply represents the change in the size of the occupation; the other two columns break this change into two components -- *net entrants* into the occupation, defined as those who newly entered the insured population in that particular occupation (calculated as the residual) minus exits from the occupation, and *net mobility*, defined as movement in from other occupations minus movement out to other occupations. These last two mobility rates are corrected by assuming that the estimated error rate may be applied to all occupational rates; this is obviously not a wholly legitimate assumption, and the resulting figures should therefore be eyed with some skepticism.

When we look down the columns of Table 6-1, we observe that net entry and net mobility contribute to different population changes in the various occupations. Of the 87 occupations, 35 reported increases and 52 decreased in size during 1966-67. Some of the large increases -- e.g., in farm occupations -- are clearly attributable to changes in the rules regarding coverage for unemployment insurance. In 62 of the 87 cases, the change due to net entry was in the same direction as the population change, and for net mobility the corresponding figure is 71 out of 87. The implication is that occupational fortunes influence mobility flows somewhat more than they do entry and exit. This is not too surprising, since mobility flows are presumably more strongly determined by economic forces, while entry and exit are at least partly influenced by personal changes in employment status and by rules regarding unemployment insurance.[1]

But it does not follow that net mobility and net entry work in the same direction. In only just over half of the occupations -- 45 out of 87 -- the signs in second and third columns of Table 6-1 agree. In a number of the instances in which net entry is negative but net mobility is positive, the explanation appears to be the salary ceiling above which persons are ineligible for unemployment insurance. Thus many persons may well enter

[1] It should perhaps be noted again that these conclusions are subject to possible error not only because of errors in occupational reporting, but also because of the nonresponse element; reporting errors inflate mobility but nonresponse inflates exit and entry.

such occupations as managers, draughtsmen, accountants, salesmen, agents, and foremen, from other occupations and below the salary ceiling. But once they have been in these occupations for some time, their higher salaries make them ineligible for unemployment insurance. On the other hand, a number of cases with positive entry but negative net mobility appear to be stations of entry into the labour force. Thus quite a few people appear to enter the labour force as clerks, typists, attendants, sales clerks, maids, and unskilled labouring occupations, and once they have acquired some basic skills and knowledge, they move out of these occupations into other ones.

It is sometimes asserted that more educated occupations are likely to be more mobile because persons in such occupations are better informed about alternative opportunities. This argument may be valid because a reduction in uncertainty about such opportunities will induce mobility. But there is another side to this coin. Lack of information will, in general, lead to a greater incidence of disappointment, which may then result in further mobility elsewhere. Under those circumstances, the multiple-moves process itself provides the information in an ex post rather than an ex ante fashion. As Table 6-2 shows, those with least education in fact tend to move most often.

Table 6-2

OCCUPATIONAL MOBILITY AND EDUCATION

Average Schooling	Average Occupational Mobility Rates (condensed) (Per cent)
Less than 8 years (33 occupations)	20.9
From 8 to 10 years (37 occupations)	12.2
More than 10 years (16 occupations)	13.5

But aggregate mobility rates are poor substitutes for response rates. Thus it is quite possible that more-educated persons are better informed about labour market opportunities and respond more strongly to changes in incentives. For this purpose, we would require more detailed occupational mobility data than are currently available. Some insight into the behaviour of occupational mobility will probably be gained from our analysis of industrial mobility in the next chapter.

CHAPTER 7

INDUSTRIAL MOBILITY

Before we start on the more formal analysis of industrial mobility, it is useful to give a broad description of main mobility patterns. Changes in industrial populations are shown in Table 7-1 for the years 1966-67. (This table is similar to Table 6-1 on occupational mobility, except that it gives four gross flows instead of two net flows.) The most obvious pattern in Table 7-1 is the similarity of exit and entry rates for any one industry, suggesting that industry characteristics relating to female employment, unemployment experience, and the proportion of professional and technical personnel, are important in determining the size of these flows. Interestingly enough, there is also a broad correspondence -- although less strongly than for exit and entry -- between in- and out-mobility rates.

Net in-mobility is somewhat more related to population change by industry than net entry. Out of 72 industries, 59 show the same direction of net mobility as for population change, and 53 the same direction as for net entry. In 40 cases, net mobility and net entry worked in the same direction. This last figure is proportionately larger than the one for occupational mobility in the previous chapter, basically because the effect of exclusions from the insured population is more evenly spread across industries than across occupations.

Rates of movement in and out, however, do not give us much idea about the actual mobility flows. The full industrial mobility matrices for 1965-66, 1966-67, and 1967-68 are reported in Appendix D, and Table 7-2 provides a summary of these matrices in terms of major groups for 1966-67. The top part of this table shows the actual mobility flows in the off-diagonal elements, while the diagonal contains the number of persons in the sample who stayed in the same industry during 1966-67. Thus 1,621 persons moved from manufacturing to construction in 1966-67. The lower half of the table shows the column and row totals, as well as the average income, unemployment rate, and proportion of females for each of the nine major industry groups (for sources, etc., see Appendex F).

Table 7-1

PERCENTAGE CHANGES IN INDUSTRIAL POPULATIONS, 1966-67

	(1) Population Change	(2) Entrants	(3) Exits	(4) Movers In	(5) Movers Out
1. Agriculture	77.0	99.7	33.1	39.8	29.4
2. Forestry	- 6.9	29.1	35.7	20.4	20.7
3. Fishing	-13.6	29.1	33.6	12.2	21.3
4. Metal mining	8.6	21.7	20.6	19.3	11.8
5. Other mining	7.5	22.3	24.1	24.1	14.9
6. Meat production	0.4	21.7	23.1	12.5	10.7
7. Dairy production	- 7.4	18.8	23.2	12.1	15.1
8. Canning	- 1.5	31.0	30.7	13.7	15.5
9. Other food	10.8	24.5	20.5	20.7	13.9
10. Beverages	3.1	28.7	24.4	10.7	11.9
11. Tobacco products	- 0.2	11.7	13.7	8.2	6.4
12. Rubber products	- 5.0	20.9	22.9	12.9	15.9
13. Leather products	- 2.4	24.0	21.5	8.3	13.2
14. Primary textiles	- 4.6	16.4	16.2	7.2	20.1
15. Miscellaneous textiles	- 3.3	24.4	24.9	14.5	17.4
16. Knitting mills	- 9.4	22.8	28.5	9.7	13.4
17. Clothing	- 2.1	23.9	23.7	5.6	7.9
18. Sawmills	3.8	23.9	24.4	27.4	23.2
19. Plywood and doors	-14.5	18.8	20.7	15.2	27.8
20. Furniture	2.5	24.0	21.0	16.1	16.7
21. Pulp and paper	- 1.7	11.7	14.3	7.6	6.7
22. Other paper	9.0	25.7	21.7	19.2	14.1
23. Printing and publishing	- 1.0	21.3	19.6	7.9	10.7
24. Iron and steel	1.6	10.6	10.9	9.0	7.0
25. Iron foundries	- 1.3	14.9	14.9	19.1	20.3
26. Smelting and refining	-10.6	10.1	11.1	9.0	18.6
27. Nonferrous metal rolling	- 2.3	16.1	18.2	13.2	13.4
28. Metal stamping and fabrication	1.1	23.7	20.5	18.1	20.2
29. Miscellaneous metal products	0.2	20.0	20.2	20.7	20.3
30. Machinery products	7.7	21.0	19.1	20.1	14.1
31. Aircraft	13.6	28.1	19.5	14.2	9.2
32. Car production	- 2.8	11.9	15.3	10.4	9.8
33. Other transport products	-13.7	13.0	20.0	10.4	17.1
34. Electrical products	6.2	25.1	21.1	12.9	10.6
35. Mineral products	-15.8	17.1	23.8	13.6	22.7
36. Petroleum refineries	28.2	40.1	24.3	24.3	11.8

(cont'd.)

Table 7-1 (concl'd.)

	(1) Population Change	(2) Entrants	(3) Exits	(4) Movers In	(5) Movers Out
37. Chemical production	1.7	23.4	21.4	14.8	15.2
38. Miscellaneous manufacturing	2.4	17.5	22.8	17.2	19.5
39. Building construction	-12.2	22.9	29.2	23.0	29.0
40. Highway construction	5.6	29.8	29.8	33.8	28.2
41. Special trade contracts	0.7	24.6	24.5	21.3	20.6
42. Air transport	1.0	29.4	40.5	22.9	10.9
43. Water transport	9.2	24.7	21.7	20.7	14.5
44. Railways	- 1.3	13.6	11.5	8.3	11.8
45. Trucking	7.1	23.7	22.6	21.8	15.9
46. Miscellaneous transport	4.1	25.4	22.2	27.0	26.1
47. Storage	13.5	22.1	25.0	30.9	14.4
48. Communications	6.2	26.2	25.6	13.8	8.2
49. Utilities	12.1	24.3	21.1	18.3	9.4
50. Wholesale trade (industrial)	- 6.6	20.4	26.2	36.3	37.2
51. Wholesale trade (consumer)	9.1	26.0	23.3	31.2	24.8
52. Wholesale trade (machinery)	- 4.4	23.9	25.3	23.6	26.5
53. Food stores	- 4.7	28.9	29.5	10.8	14.8
54. Department stores	7.3	28.9	20.9	8.6	9.2
55. Variety and general stores	0.9	34.5	28.3	15.1	20.4
56. Car dealers, etc.	- 1.3	24.5	23.3	14.3	16.7
57. Clothing, etc.	- 0.7	26.7	24.2	13.0	16.2
58. Furniture, appliances, etc.	- 6.3	23.7	24.3	19.0	24.6
59. Other retail stores	0.4	27.4	25.3	18.2	19.9
60. Banks, etc.	- 2.4	27.5	29.2	8.2	8.8
61. Insurance, etc.	1.7	27.2	26.3	13.0	12.3
62. Education	14.7	33.8	27.7	17.4	8.8
63. Health	10.2	38.1	30.3	11.0	8.6
64. Miscellaneous personal services	4.1	33.0	30.1	20.8	19.7
65. Business services	1.6	33.5	33.0	16.6	15.5
66. Barbers, etc.	0.7	32.0	32.4	6.7	5.7
67. Laundries	- 3.5	28.1	28.7	9.2	12.2
68. Hotels and restaurants	2.5	37.1	35.0	11.5	12.1
69. Other personal services	- 6.6	22.2	28.9	20.2	20.0
70. Miscellaneous services	6.6	30.2	27.7	24.3	20.1
71. Federal and provincial administration	3.7	37.8	38.7	15.5	10.9
72. Local administration, etc.	0.2	30.6	31.2	17.7	16.5

The row total represents the 1966 population in a particular industry that remained in the insured population; the column total gives the number of persons in a particular industry in 1967 who stayed in the insured population in 1966-67.

Table 7-2

MOBILITY MATRIX FOR NINE MAJOR INDUSTRY GROUPS, 1966-67

From \ To	Major Industry Groups (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Farming, forestry, fishing & trapping	4,624	65	716	386	317	253	19	139	213
2. Mining	63	5,900	326	229	135	102	14	90	45
3. Manufacturing	718	935	101,238	1,621	1,528	3,428	356	1,694	428
4. Construction	365	257	1,645	19,031	695	775	121	588	236
5. Transportation, utilities	187	160	1,376	483	28,850	687	124	564	427
6. Trade	261	178	3,646	904	1,221	45,359	451	1,427	330
7. Finance & real estate	11	21	383	136	141	288	11,238	454	120
8. Services	130	90	1,536	417	571	1,306	424	27,512	345
9. Government	174	31	267	221	543	183	54	323	7,260

	Column Totals		Row Totals	Average Income	Unemployment Rate (Per cent)	Percentage Female
(1)	6,533		6,732	3,096	39.0	3.6
(2)	7,637		6,904	5,498	4.3	4.7
(3)	111,133		111,946	4,582	3.8	26.2
(4)	23,428		23,713	4,955	9.9	3.0
(5)	34,001		32,858	4,902	4.3	16.1
(6)	52,381		53,877	3,433	4.1	41.3
(7)	12,801		12,792	3,533	3.0	66.4
(8)	32,891		32,331	2,956	6.1	55.9
(9)	9,404		9,056	3,834	9.7	23.1
Sum	290,209	Sum	290,209			

One of the first things we notice in examining Table 7-2 is that industry size has a major influence on mobility, i.e., the larger the industry, the greater the movement in and out of other industries. Thus the figures for manufacturing are, on the whole, larger than for any other group, as shown in row (3) and column (3). The reason is that, *ceteris paribus*, larger industries have more and more varied employment opportunities. A

similar conclusion was also noted in Chapter 5, where the size of the receiving province was found to be an important determinant of migration flows.

But clearly industry size is not the only determinant of mobility flows. From a brief glance at Table 7-2, one might conclude that high unemployment drives people out and that high income attracts them. Thus industry group 1 -- farming, forestry, fishing, etc. -- with the highest unemployment rate also has the highest rate of out-mobility. And persons moving out of group 1 have a greater tendency to move to high-wage industries such as construction and transportation than to the low-wage service industry. But it is easy to find exceptions to these generalizations. For example, in total, a slightly larger number of persons moves into industry group 1 with a very high unemployment rate than into mining, which has a low claimant rate (perhaps partly because of an aggregation problem, since we have merged three industries with different experiences to make industry group 1). Also, persons leaving industry group 7 -- finance -- find their way in larger numbers to the low-wage service sector than to construction or transportation.

Theoretical Model

The foregoing discussion of Table 7-2 illustrates that it is not easy to detect any mobility pattern that has a simple explanation. Let us therefore proceed more formally by setting up some hypotheses and by testing them with our mobility data. The following equation reflects our discussion concerning general hypotheses in Chapters 4 and 5:

$$M_{ij} = a_0 + a_1 Y_j + a_2 Y_i + a_3 U_j + a_4 U_i + a_5 D_{ij}. \quad (7\text{-}1)$$

M_{ij} represents the mobility flow from industry i to j; Y refers to the industry wage and U to the unemployment rate; and D_{ij} represents the "distance" between industry i and j -- that is, the monetary and psychic costs of moving. We would expect M_{ij} to be positively related to Y_j and U_i; negatively, to Y_i, U_j and D_{ij}.

The Y and U variables are operational variables for which we have quantitative estimates (see Appendix F), but the D_{ij} variable is more difficult to quantify. In Chapter 5, when studying interprovincial mobility, we

used a measure of geographical distance to reflect D_{ij} and discussed various aspects of the costs of movement represented by this distance variable in the case of migration. But this simple approach will not suffice when we consider industrial mobility. Here D_{ij} should represent such things as:

-- differences in education and training requirements;

-- differences in basic skills;

-- differences in products handled;

-- differences in working conditions, which includes a variety of aspects such as blue-collar versus white-collar jobs, indoor versus outdoor, large versus small establishment, urban versus rural location, etc.; and

-- differences in unionization and pension plan coverage.

No comprehensive measure can represent all these things. Some quantitative information on education, unionization, and pension plans does exist, but it is even difficult to visualize how the other "costs of adjustment" might be measured. However, to provide some insight into these various elements of the "costs of adjustment", we shall describe some of the patterns observable from the full industrial mobility matrix (see Appendix D).

Three striking generalizations emerge from a brief glance at the major mobility flows of the matrix. First, a large number of major mobility flows are near the diagonal. As can be seen from Table 7-1, the order in which industries appear is the usual one employed in industrial classification systems, starting with primary industries, then manufacturing, construction, transportation, and trade, and ending with service industries. As can readily be seen, there are sizable mobility flows among industry components of the main groupings, e.g., primary, textile, wood and paper products, construction. The major exceptions to this generalization are three groups of dissimilar manufacturing industries, 10-13 (beverages, tobacco, rubber, and leather), 24-26 (iron and steel, iron foundries, and smelting and refining), and 34-36 (electrical, mineral products, and petroleum

refineries), and some service industries, 62-67 (education, health, miscellaneous, business services, barbers, and laundries). This generalization suggests that the industries are in some sort of "natural" order, in the sense that people encounter smaller costs of movement when they go to "neighbouring" industries.

Secondly, construction and wholesale trade are involved in mobility flows with many other industries. A large part of the major mobility flows away from the diagonal are accounted for by flows to and from these two industry groups.

The third generalization is related to the previous ones; broadly speaking, the mobility matrix is symmetrical with regard to the diagonal. Less technically, this states that if we find a major mobility flow from industry A to B, we are also likely to observe a major flow from B to A. This may be the result of return mobility, which tends to link flows in opposite directions. But this is not a very important phenomenon in the case of industrial mobility (see Appendix B). The other explanation for this observed symmetry is that the cost of movement between such industries as A and B is small in *either* direction. But we may not use this as evidence in calculating a comprehensive measure of the varying costs of movement since that would clearly be tautological.

The following three examples serve to indicate how complex the costs-of-movement concept is. People leaving the fishing industry move in fairly large numbers to forestry, canning, the three construction industries, and federal and provincial administration. Persons leaving the automobile industry typically go to metal stamping, other metal products, machinery, aircraft, electrical products, mineral products, special trade contracts in construction, wholesale trade in consumer goods or machinery, and car dealers. Finally, persons moving out of business services typically end up in printing and publishing, miscellaneous manufacturing, the three construction industries, wholesale trade, banks, insurance, miscellaneous services, or government. No doubt, part of the apparent complexity is the result of the fact that industries are aggregations of occupations. On the other hand, it is likely that the kind of product, the nature of the work, and the physical location are important aspects of the "costs" of mobility, and these concepts are at least in part related to the notion of industry.

Referring back to Table 7-2, we can see that a number of these distinctions become blurred by aggregation into broad industry groups. In other words, there are no zero elements in Table 7-2, while there are many zero or near-zero elements in Appendix D.

From the preceding discussion, we may conclude that it is difficult to measure the costs-of-movement variable objectively. We might therefore start by assuming that we cannot measure D_{ij}. We can then proceed by testing for the significance of other variables by estimating an equation such as (7-1) without D_{ij}. If D_{ij} is an important and significant variable, this procedure will produce rather poor results. For each of the 72 industries, we estimate the following equation:

$$M_{ij} = a_0 + a_1 Y_j + a_2 U_j + a_3 P_j. \qquad (7\text{-}2)$$

The dependent variable M_{ij} is the proportion of industry i's population (excluding exits) which moves to j in 1966-67 -- a total of 71 observations for each industry. There are 72 such equations, one for each industry's out-mobility to other industries; we leave out industry 73, unspecified (see Appendix D). Y_j is average income in industry j for persons working full time during the year; the other income variable available for our sample -- namely, overall income -- produced somewhat inferior results in preliminary testing and is therefore not used in the subsequent results. U_j represents the claimant rate in industry j, and P_j is the size of the population in j. For sources and definition, see Appendix F. It is not necessary to include the Y_i and U_i variables of equation (7-1) because equation (7-2) is applied to each of the rows of the mobility matrix in turn.

The results are indeed very poor. Not only is the explanatory power of equation (7-2) very low, but the income and unemployment variables are, on the whole, insignificant. Of the 72 Y_j coefficients estimated, only 16 are significantly positive, while 37 are insignificant, and 19 are significantly negative. In the case of the U_j variable, there are no significantly negative coefficients, and 65 estimates are insignificant, with the remainder significantly positive. Only the P_j variable, which represents the size of industry j, is significantly positive in 57 out of the 72 equations estimated. In an indirect way, these results confirm

the proposition that the costs-of-movement variable cannot be ignored; in fact, leaving out D_{ij} appears to have the effect of making the other main economic variables Y_j and U_j insignificant.

It is possible that aggregation of the mobility matrix will help to obscure the importance of the D_{ij} variable. The argument is that for major industry groups the D_{ij} variable is more likely to have roughly the same value. We therefore next estimate an equation such as (7-1) without the D_{ij} variable for the mobility matrix of broad industry groups (see Table 7-2). The result is the following equation (using 9 x 8 = 72 observations):

$$M_{ij} = \underset{}{-.010} + \underset{(.011)}{.002Y_j} - \underset{(.002)}{.00004Y_i} + \underset{(.015)}{.016U_j} + \underset{(.014)}{.061U_i} + \underset{(.0004)}{.0036P_j}$$

$$R^2 = .678. \qquad (7\text{-}3)$$

The symbols retain their earlier meaning; Y is average total earnings measured in thousands of dollars, and P_j, the size of the j-th industry, is measured in terms of thousands of persons.

The most significant variable by far in equation (7-3) is industry size P_j, as the sole independent variable P_j produces an $R^2 = .554$, but this is largely the consequence of aggregating into industry groups that are unequal in size. The results regarding the more important economic variables are not significant at all, with the exception of U_i, unemployment in the sending industry, which is significant. This is probably largely accounted for by our industry group, farming, forestry, fishing, etc., which, as we observed above, has a high rate of out-mobility and a high unemployment rate. If we leave the three insignificant variables, Y_j, Y_i, and U_j, out of the regression, the remaining coefficients and the R^2 stay virtually unchanged.

Further Specification

The foregoing results are not very encouraging, but they were not expected to be, since important costs-of-movement variables were left out of the equations. To obtain meaningful results, we shall obviously have to use at least those costs-of-adjustment variables for

which we have quantitative measures: the extent of collective agreements, the existence of private pension plans, the level of education, and the sex ratio.

Collective agreements and pension fund provisions are usually accompanied by seniority rules, which are often quoted as barriers to industrial mobility. The reason is that a person who has established seniority privileges or pension rights in a particular company has to give these up when moving to another firm or, generally, to another industry. This argument is persuasive and has been supported by some empirical evidence.

To obtain some preliminary ideas about the importance of these two variables, we may look at some aggregate mobility rates in Table 7-3. In the top half of this table, industries are grouped according to the proportion of workers who are under collective agreements (CA); in the lower half, they are grouped according to the proportion of employees covered by pension plans (PP). The sources of these statistics are reported in Appendix F; for some of the industries, no information is available and they are therefore left out of the table. The figures reported are the industrial mobility rates for 1966-67.

The effect of unionization on mobility rates appears quite clear-cut; the more unionized an industry, the lower the mobility rate. Pension plans are more widespread than collective agreements, which may make it more difficult to test for the effect of PP. In any case, there is no unequivocal tendency for mobility rates to decline when pension plan coverage increases, although the lowest mobility is observed for the group of industries in which more than 80 per cent of workers are covered by pension plans.

The third variable to be included to represent parts of the costs of movement is E, the average number of years of schooling of the labour force in an industry (see also Appendix F). As already mentioned in the previous chapter, the level of education may have two opposing effects on the rate of mobility. The higher the average education level in industry i, the smaller the average cost of movement to other industries, because the chances of their requiring more schooling are lower and the chances of being better informed are higher. Thus it might be supposed that education aids mobility. But mobility itself provides information about career opportunities, suggesting that persons with less education may be

more mobile, at least soon after entering the labour force, when they hunt for suitable jobs. In the previous chapter, we found no clear-cut tendency for occupational mobility rates to vary with education levels. Whereas occupations are at least partly distinguished by schooling levels, industrial categories have virtually no relation to education criteria. This means that in the case of industries the education measure will be a less meaningful average than for occupations.

Table 7-3

AVERAGE MOBILITY RATES OF PERSONS IN INDUSTRIES WITH COLLECTIVE AGREEMENTS (CA) AND PENSION PLANS (PP), 1966-67

	Average Mobility Rates (Per cent)
Industries with collective agreements	
CA less than .4 (22 industries)	21.6
CA between .4 and .7 (24 industries)	18.6
CA more than .7 (16 industries)	17.5
Industries with pension plans	
PP less than .6 (15 industries)	19.9
PP from .6 to .8 (22 industries)	23.6
PP more than .8 (25 industries)	15.7

The fourth variable is *F*, the proportion of female workers in an industry. We have seen earlier that women are, on the whole, less mobile than men, which suggests that the larger *F* is, the smaller the mobility out of that industry will be. Moreover, as will be explained momentarily, this variable also signifies a segmentation of the labour market into predominantly male and predominantly female industries. (Note that the *F* variable in this chapter does not denote the same thing as in Chapter 5.)

Preliminary testing revealed that the pension fund variable *PP* is of no significance, so it is therefore eliminated from the results reported here. The remaining three variables, *CA*, *E*, and *F* enter the regressions in a particular way, which requires some explanation. The basic idea is that all three variables at least partly represent a kind of segmentation of the labour market into more- and less-unionized sectors, more- and less-educated industries, and mostly male and mostly female groupings. This segmentation implies less mobility between dissimilar industries and more mobility between

similar sectors. Taking the F variable as an example, we can express this segmentation aspect with the aid of a variable such as $(\sqrt{F_i} - \sqrt{F_j})^2$. This expression will be larger the less similar industries i and j are with regard to the proportion of female employees; the expression will be zero for two industries that have only female employees, but it will also be zero for two entirely male industries. Now, we would expect mobility to be reduced by segmentation or, in other words, our mobility variable Mij to be negatively affected by our segmentation variables. Ignoring other variables for the moment, we can write this in linear form as follows:

$$M_{ij} = b_0 + b_1(\sqrt{F_i} - \sqrt{F_j})^2. \qquad (7\text{-}4)$$

We would expect b_1 to be negative. By multiplying out the expression, we obtain the following equivalent equation:

$$M_{ij} = b_0 + b_1F_i + b_1F_j - 2b_1\sqrt{F_iF_j}. \qquad (7\text{-}5)$$

Concentrating purely on the segmentation aspect, when estimating equation (7-5) we would expect the F_i and F_j coefficients to be negative and the same size, and the $\sqrt{F_iF_j}$ coefficient to be positive and twice the absolute size of the F_i parameter. Estimation of (7-5) gives us therefore an interesting test of the segmentation proposition. By not imposing these restrictions we can write the full mobility equation as follows:

$$\begin{aligned} M_{ij} = {} & a_0 + a_1Y_j + a_2Y_i + a_3U_j + a_4U_i + a_5F_i + a_6F_j \\ & + a_7\sqrt{F_iF_j} + a_8E_i + a_9E_j + a_{10}\sqrt{E_iE_j} + a_{11}CA_i + a_{12}CA_j \\ & + a_{13}\sqrt{CA_iCA_j}. \end{aligned} \qquad (7\text{-}6)$$

Purely in terms of the segmentation argument, we would expect the following estimating results:

$$\begin{aligned} a_5 &= a_6 < 0 & a_7 &= -2a_5 \\ a_8 &= a_9 < 0 & a_{10} &= -2a_8 \\ a_{11} &= a_{12} < 0 & a_{13} &= -2a_{11}. \end{aligned} \qquad (7\text{-}7)$$

But there are a number of reasons why our parameter estimates may not obey the conditions in equation (7-7). First of all, segmentation may not have a completely symmetrical effect. For example, mobility may be systematically less between two unionized industries than between two nonunionized industries. This would mean that $\sqrt{CA_i CA_j}$ also absorbs the negative effect of this lack of symmetry. The result may still leave the coefficient of this variable (a_{13}) as positive, but it will be less than twice the absolute size of a_{11} and a_{12}.

Secondly, estimating (7-6) allows us to incorporate other effects of the same variables. We have already discussed the smaller mobility rate among females. Thus an industry with more female workers would be expected to have a lower rate of out-mobility. This means that, aside from the segmentation argument, F_i will have a negative effect on our dependent variable. We would then expect a_5 to be larger in absolute size than a_6. Along the same lines, workers in unionized industries may be less mobile because unionization brings with it nonwage benefits that a worker is not eager to give up. This would mean that the CA_i variable captures an additional negative effect. On the other hand, CA_j may represent an additional positive effect because, other things being equal, workers are attracted to a unionized industry. The net result may be that a_{11} is more negative than a_{12}.

In the case of our education variable, the segmentation argument has some interesting ramifications. As an objective cost of adjustment, we would expect education to produce a strongly asymmetrical type of segmentation. A person without much education has to overcome a large cost of adjustment (in the form of money outlay and forgone earnings) in order to be able to enter a labour market that requires more education. But a person with a great deal of general education does not have to incur any costs to enter a labour market that requires less education. On the other hand, the psychic costs of adjustment are probably greater the more apart the two industries are, in terms of education requirements, regardless of the direction. Thus an average person in industry i is unlikely to be happy about moving to other industries that have far more or far less in the way of education standards. In fact, if industry j's education requirement is lower than i's, the psychic cost aspect may be even more important than in the upward direction.

The conclusion to be drawn from this discussion is that the parameters of the education variables may not obey the symmetry conditions of (7-7). If the objective cost-of-adjustment aspect is of overriding importance, then we would expect that the E_j parameter a_9 would be more negative than the E_i coefficient a_8. If, on the other hand, the asymmetry of the psychic-cost aspect counterbalances the asymmetry of the objective-cost aspect of education, then conditions in (7-7) may hold approximately. We will be able to evaluate these and earlier arguments when we look at the parameter estimates of equation (7-6).

Results

The equations, written vertically, are shown in Table 7-4. They correspond to equation (7-6) except that the P_j variable has been added, representing the size of the sample population in industry j. This variable has been used before in the work on geographic mobility (Chapter 5) with the argument that it represents, in part, the employment opportunities in the receiving labour market. The dependent variable M_{ij} is the number of persons who moved from industry i to j, expressed as a proportion of the population in industry i who remained in the insured population. The number of observations is 4,692 (69 x 68 industries), since four industries are left out due to lack of data (industries 46, 66, 69, and 73, see Appendix F).[1]

The first thing we notice about Table 7-4 is the low coefficients of determination (R^2), which on average indicate that the equations explain only about 13 per cent of the variance of our full industrial mobility matrix. This implies that we have not been quite successfull in locating all the various factors that influence the industrial mobility pattern. On the other hand, it should be remembered that these results are based on a very large number of observations of a cross-section type, and low coefficients of determination are the rule in this kind of work. It is, of course, possible to

[1]For this purpose, the variables reported in Appendix F are multiplied by certain fractions to obtain reasonably sized coefficients: $Y \times 10^{-5}$, $U \times 10^{-4}$, $CA \times 10^{-4}$, $E \times 10^{-2}$, $F \times 10^{-3}$, $P \times 10^{-5}$. These fractions are also used in the subsequent regressions shown in this chapter. The independent variables are the same for each of the three regressions shown, except the U and P variables, which differ for the three years.

alter the specification of the model and obtain much better coefficients of determination. One type of specification that accomplishes this is the casting of the dependent variable in terms of the proportion of stayers in an industry.[2] It will be realized that this is a form of aggregation along the rows of the mobility matrix. This specification was attempted with our data, but the results are not reported here since the advantages are completely illusory. First, the coefficients of determination are much higher, but they cannot be compared with the ones reported, since the dependent variables are different. Second, the resulting parameter estimates are not really different, and therefore this method does not shed any additional light on the questions asked here.

Broadly speaking, the qualitative results reported in Table 7-4 are in keeping with the hypotheses advanced. Except for Y_i, all variables are, on the whole, significant and most of them have the expected sign. Thus, in line with our arguments the CA, E, and F variables have negative coefficients, and the interaction variables, such as $\sqrt{CA_i CA_j}$, have positive parameters. Income in the receiving industry Y_j has a positive effect, and unemployment in the sending industry U_i also has a positive influence on industrial mobility. Also, the P_j variable, which represents part of the employment possibilities in the receiving industry, has a strong positive effect.

The two puzzles are the insignificant coefficient of Y_i and the significantly positive parameter of U_j. The first puzzle can perhaps be resolved when we recall the other effects of Y_i referred to in Chapter 5. It was argued there that the average income in labour market i not only represents forgone opportunities (which should have a negative effect on mobility), but also describes some of the characteristics of persons in labour market i. In particular, it may be argued that the lower the average income in industry i, the lower the income position obtained in industry j by those who move, because lower income signifies lower productivity. This productivity effect of Y_i on M_{ij} is obviously positive and will therefore tend to offset the negative opportunity effect.

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[2]This specification is used a great deal by Lowell Gallaway; see the references quoted in footnote 4 of Chapter 3, and his "Age and Labor Mobility Patterns", *Southern Economic Journal*, vol. 36 (October 1969).

In a similar way, Y_i represents the average wealth position, which has an effect on the ability to finance mobility decisions, and this wealth effect of Y_i is also positive. As a result, the net effect of Y_i may be insignificant as reported here.

Table 7-4

INDUSTRIAL MOBILITY EQUATIONS

(4,692 observations)

	1965-66	1966-67	1967-68
Constant	.0016	.0041	.0008
Y_i	-.0228*	-.0202*	.0160*
	(.0183)	(.0187)	(.0182)
Y_j	.0438	.0458	.0152*
	(.0184)	(.0189)	(.0183)
U_i	1.2331	.6028	.7492
	(.2418)	(.1525)	(.1416)
U_j	1.1042	.4598	.6026
	(.2419)	(.1525)	(.1413)
CA_i	-.5738	-.5869	-.4939
	(.0802)	(.0827)	(.0803)
CA_j	-.5260	-.6164	-.5327
	(.0806)	(.0831)	(.0806)
$\sqrt{CA_i CA_j}$	.5316	.5751	.4360
	(.1100)	(.1132)	(.1094)
E_i	-.6191	-.5607	-.6169
	(.0933)	(.0996)	(.0947)
E_j	-.6060	-.5486	-.6066
	(.0934)	(.0997)	(.0948)
$\sqrt{E_i E_j}$	1.2397	1.1037	1.2437
	(.1932)	(.2063)	(.1963)
F_i	-.0988	-.0961	-.0783
	(.0088)	(.0091)	(.0087)
F_j	-.0852	-.0863	-.0879
	(.0089)	(.0092)	(.0089)
$\sqrt{F_i F_j}$	.1595	.1573	.1496
	(.0147)	(.0151)	(.0145)
P_j	.0526	.0486	.0415
	(.0028)	(.0026)	(.0026)
R^2	.1402	.1352	.1181

*Not significant at the 5 per cent level.

The second puzzle cannot easily be rationalized. The U_j coefficients in Table 7-4 state that the higher the unemployment rate in industry j, the more people want to move to j, perhaps from a misspecification in our model. We have to remember that we cannot appropriately test for the significance of one variable in a model unless we are certain that the rest of the model is properly specified. We may be able to improve our model in two ways -- i.e., by paying some attention to other costs of adjustment alluded to earlier in this chapter but not quantified, and by providing a better representation of the employment opportunities notion, in particular of its turnover aspect. We shall examine these two ideas in turn.

Earlier on in this chapter, we discussed some of the main features of the industrial mobility matrix. This discussion suggests that the cost of adjustment between industries i and j is less when both industries are concerned with the same kind of products. Presumably, working with a product brings with it certain skills that are employable in other industries using similar products. We can also argue that the cost of adjustment is likely to be less when the work environments and kinds of work are similar. These are reasonable hypotheses, but how do we quantify the similarities? The procedure adopted here is to create a special kind of dummy variable that reads one when the two industries concerned are similar, and zero otherwise. Industries may be similar in terms of product group (or products used), in terms of work environment (indoor-urban or outdoor-rural), and in terms of type of work (heavy or light). If two industries are similar in all these three aspects, the dummy reads one; if they are strongly similar with regard to the product group only, the dummy also reads one. The precise procedure is explained in detail in Appendix G.

It is clear that this similarity dummy (SD) only represents the costs-of-adjustment differentials in a very rough and approximate way. Nevertheless, it will be interesting to see whether the SD variable contributes to the explanatory power of our mobility equation. A significantly positive parameter for SD will confirm the importance of other costs of mobility. It will be realized that SD represents not only monetary costs, but also psychic costs. If two industries are similar by our definition, the average worker may have to acquire

less in the way of new skills when moving, but he will also probably encounter less psychic cost in the adjustment.[3]

The results of adding our *SD* variable to the mobility equations are reported in Table 7-5. The coefficients of determination are considerably higher, and the *SD* variable has a very significantly positive parameter. Thus there is very strong support for the proposition that we have up to now excluded some large costs of moving, even though *SD* is a very inadequate measure of these other costs. The other parameter estimates are not much affected by the inclusion of *SD*. In particular, our second puzzle -- the positive coefficient of U_j -- has not been resolved. We now turn therefore to our second idea for improving the model.

So far, employment opportunities and uncertainty have been represented by two basic variables -- unemployment rate and size of the relevant labour market. These variables do not explicitly measure the turnover in a labour market. Turnover obviously has an influence on the number of job opportunities as perceived by a typical individual. For example, a high rate of turnover in labour market j means that j has a large number of employment opportunities over a particular period of time for persons in industry i. With our data, two flows constitute the turnover outflow from industry j: OUT_j, the number of persons leaving j to go to other industries; and $EXIT_j$, the number of people in j leaving the insured population (both expressed as proportions of j's population). Both these variables are included in the regressions shown in Table 7-6.

These results broadly confirm our suspicion that the U_j variable unintentionally represented the turnover phenomenon and thus obtained a coefficient with a positive sign earlier. In Table 7-6, the turnover variables have significantly positive coefficients in all but one case,

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[3]For a discussion of a number of other specifications and refinements of our industrial mobility equations, see paper by John Vanderkamp, "Industrial Mobility: An Empirical Model", Department of Economics, University of Guelph, Ontario (forthcoming). In this chapter we have concentrated on the industrial aspects of the costs of movement. In some cases of industrial mobility, it is also necessary to change occupations or location, which clearly raises the costs of movement. In the forthcoming paper, an attempt is made to take account of these added costs.

and the U_j variable is no longer significantly positive in two of the three years. If an industry, for a variety of reasons, has a high turnover of labour, it is also quite likely to be a high-unemployment industry, particularly since the unemployed are assigned to industries on the basis of their last jobs. Thus, in a number of industries, high unemployment may mean large turnover, which, at least to some extent, represents favourable employment opportunities.

Table 7-5

MOBILITY EQUATIONS INCLUDING SIMILARITY DUMMY

(4,692 observations)

	1965-66	1966-67	1967-68
Constant	.0008	.0032	.0001
Y_i	-.0135*	-.0109*	.0265
	(.0179)	(.0183)	(.0177)
Y_j	.0557	.0581	.0286*
	(.0181)	(.0185)	(.0179)
U_i	1.0995	.5141	.6377
	(.2368)	(.1492)	(.1384)
U_j	.9551	.3616	.4883
	(.2369)	(.1493)	(.1382)
CA_i	-.3865	-.3916	-.3087
	(.0795)	(.0819)	(.0794)
CA_j	-.3478	-.4303	-.3556
	(.0799)	(.0822)	(.0796)
$\sqrt{CA_i CA_j}$	.3071	.3407	.2126
	(.1087)	(.1118)	(.1079)
E_i	-.3922	-.3161	-.3663
	(.0927)	(.0988)	(.0940)
E_j	-.3800	-.3050	-.3565
	(.0927)	(.0989)	(.0940)
$\sqrt{E_i E_j}$	.7655	.5933	.7186
	(.1918)	(.2047)	(.1948)
F_i	-.0765	-.0732	-.0552
	(.0088)	(.0090)	(.0087)
F_j	-.0619	-.0623	-.0636
	(.0088)	(.0091)	(.0088)
$\sqrt{F_i F_j}$	.1120	.1078	.1003
	(.0147)	(.0151)	(.0145)
P_j	.0497	.0458	.0390
	(.0027)	(.0026)	(.0025)
SD	.0031	.0032	.0032
	(.0002)	(.0002)	(.0002)
R^2	.1770	.1708	.1592

*Not significant at the 5 per cent level.

Implications

In this concluding section, we shall refer to the final estimating results obtained in Table 7-6. We first turn our attention to the income variables. Income prospects in the receiving industry appear to have an important positive effect on industrial mobility. Moreover, our interpretation of the insignificant contribution of Y_i implies that the negative effect of forgone earnings would be observable if it were not for the positive productivity and wealth effects of Y_i. We may therefore conclude that the labour market works, in the sense that labour supplies respond to differential income prospects. Thus larger numbers of workers move from low-wage industries into high-wage industries than vice versa. This gives rise to a very important observation regarding incomes policies that attempt to freeze the wage structure. There is a well-known argument that says that incomes policies can be pursued without harmful effects on the workings of the labour market, since labour supplies do not respond to differential earnings.[4] Our results clearly show this argument to be fallacious, since workers do in fact respond to income prospects.

As our results derive from a cross-section analysis, we cannot say how long it would take for the labour supply response to be affected by an incomes policy. It is quite possible that it would take a year or two for the harmful effects to be noticeable. On the other hand, an incomes policy that is only enforced for a year or two would probably have little beneficial impact on the rate of inflation.

Employment opportunities also play an important role in our model. More people leave industries with high unemployment rates, and a large labour market with many employment opportunities serves as an attraction. Also a high rate of out-mobility in an industry creates more job opportunities within any particular period, and this appears to have a positive influence on mobility flows into that industry. Our data do not permit a distinction between voluntary and involuntary mobility. We might, however, expect that an involuntarily mobile person would place somewhat greater emphasis on employment opportunities than income prospects. Part of the observed influence

[4]See Organisation for Economic Co-operation and Development, *Wages and Labour Mobility* (Paris: OECD, 1965).

of our turnover variables may thus be the reflection of the behaviour of involuntarily mobile people.

Table 7-6

MOBILITY EQUATIONS INCLUDING *OUT* AND *EXIT* VARIABLES

(4,692 observations)

	1965-66	1966-67	1967-68
Constant	-.0056	-.0023	-.0048
Y_i	-.0123* (.0178)	-.0108* (.0182)	.0264* (.0176)
Y_j	.0927 (.0185)	.0915 (.0191)	.0351 (.0184)
U_i	1.0067 (.2353)	.5224 (.1485)	.6348 (.1377)
U_j	.8524 (.2821)	.0415* (.1715)	.2568* (.1785)
CA_i	-.4123 (.0796)	-.3798 (.0816)	-.2984 (.0792)
CA_j	-.1971 (.0843)	-.2995 (.0843)	-.1708 (.0830)
$\sqrt{CA_i CA_j}$	.3468 (.1092)	.3210 (.1114)	.1935* (.1077)
E_i	-.3042 (.0926)	-.3270 (.0984)	-.3632 (.0935)
E_j	-.2762 (.0930)	-.3203 (.0986)	-.3493 (.0938)
$\sqrt{E_i E_j}$	.5821 (.1917)	.6157 (.2038)	.7122 (.1937)
F_i	-.0784 (.0087)	-.0731 (.0090)	-.0550 (.0086)
F_j	-.0334 (.0095)	-.0454 (.0097)	-.0485 (.0090)
$\sqrt{F_i F_j}$	.1169 (.0147)	.1076 (.0151)	.0999 (.0145)
P_j	.0502 (.0027)	.0455 (.0026)	.0389 (.0026)
SD	.0030 (.0002)	.0032 (.0002)	.0031 (.0002)
OUT_j	.0151 (.0018)	.0084 (.0019)	.0142 (.0021)
$EXIT_j$	-.0020* (.0025)	.0082 (.0020)	.0040 (.0021)
R^2	.1895	.1791	.1691

*Not significant at the 5 per cent level. The *OUT* and *EXIT* variables differ for the three years.

The remaining 10 variables all measure, imperfectly, some aspects of the cost of moving and the barriers to mobility. The statistical significance and parameter sizes of these variables attest to the great importance of adjustment costs. Thus, while we conclude that the labour market works in the sense that supply responds to differential income prospects and employment opportunities, we should also appreciate that several barriers to mobility have a strong impact on mobility patterns. This means that we should not test supply response by some simple-minded correlation of supply change and income variables. It also implies that the ease with which the imbalance in a particular labour market will be corrected depends very much on the position of this labour market in the mobility spectrum. For example, if industry i finds itself in a labour surplus position, and the industries with good income prospects and employment opportunities have very large costs of mobility vis-à-vis industry i, then we may expect that it will take some considerable time before the surplus in i has worked itself out. The implications for the industrial training programs and other such policies are obvious.

Even though our 10 variables are, no doubt, an imperfect measure of the total costs of moving between industries, they already display a remarkable variety. For example, the cost factor is affected by the type of product, the work environment, and the nature of the work. The other variables represent a three-way segmentation of the overall labour market, indicating that differences in education, unionization, and sex ratio produce significant barriers to mobility. Most of these factors are in the nature of data, in the sense that they are related to technological and human characteristics. Thus some persons are better suited for manual work; others, for work involving mental capacities. Similarly, the significance of our F variable presumably derives from the fact that some types of work are more suitable for women than for men. The importance of product similarity suggests that certain basic knowledge and skills are associated with the type of product handled. The education variables reveal the importance of job characteristics with regard to education and skills. To be sure, not all of this effect is attributable to the technology of the work; at least a part of it relates to the psychic attachments of people.

It is striking to note that the so-called symmetry conditions of equation (7-7) apply only in the case of our education variables. It was argued above that this result may be expected if the psychic cost elements are of overriding importance. A word of caution is, however, in order. It is possible that the symmetry derives from the fact that jobs requiring less in the way of general education (measured by E) may require more in the way of specific skills. The channels by which these skills are obtained include on-the-job training, apprenticeships, vocational schooling, etc., none of which are captured by our E variables. Thus a move from an industry with a large E value to one with a small E may require a sizable investment in skills that are not part of a person's general education. In any case, the results show that differential educational requirements, perhaps combined with skill requirements, present important barriers to mobility. Manpower policies related to training and education may, of course, be used to help workers overcome these barriers. Such policies may be used to aid the disadvantaged in the labour market and may be useful in correcting income inequalities. However, when such policies are used to improve the overall "efficiency of the labour market", we have to keep in mind the same kind of warnings as stated in the concluding section of Chapter 5.

The coefficients of the F variables in Table 7-6 confirm the segmentation of the labour market in terms of the two sexes. This result is very much in line with casual observations. The F_i parameter is negative and larger in absolute size than the F_j coefficient, presumably signifying the fact observed earlier that women are less mobile than men.

Finally, the pattern of the collective agreement coefficients suggests that the labour market is segmented into more- and less-unionized industries.[5] Moreover, the size of the coefficient of the interaction variable $\sqrt{CA_i \cdot CA_j}$ (which is positive but less than double the

[5]It should be noted that the data do not permit us to differentiate between different types of unions -- e.g., industrial unions and craft unions. It could be argued that industrial unions facilitate occupational mobility while craft unions facilitate industrial mobility. Unfortunately it is not possible to examine such propositions in the context of this Study.

absolute size of the other *CA* parameters) indicates that mobility is smaller between two unionized industries than between two nonunionized ones. At first glance, these results may suggest that the abolition of unions would lead to a substantial increase in industrial labour mobility. Such a sweeping conclusion cannot, however, be made without further evidence. Unionization is most frequently found in large establishments and usually involves manual workers in manufacturing, construction, transportation, mining, and forestry industries. Therefore it is at least possible that our unionization variable represents, as a proxy variable, other aspects of the work environment. Thus the segmentation represented by our *CA* variables may, in part at least, be the result of a segmentation in terms of the size of establishment and the nature of the work performed. It is reasonable that different workers should attach very different utilities to these characteristics of the work environment, thereby creating the segmentation observed. If this last interpretation is correct, then there are no obvious policy conclusions about the effects of unionization on industrial labour mobility.

CHAPTER 8

SUMMARY AND CONCLUSIONS

The Canadian labour force shows a great deal of natural mobility. Of those who remained covered by unemployment insurance -- the "insured population" -- during our sample period, close to 30 per cent changed industry, occupation, or province of employment in the course of a year. The purpose of this Study is to describe and analyse their mobility patterns, using data that, at least for Canada, are unique.

Most of the data are reported in the various appendixes to enable other students of labour mobility to test different hypotheses.

The data base does, however, have two main limitations. First, the sample necessarily consisted of the population eligible for unemployment insurance in the mid-sixties, which comprised only about 60 per cent of the economically active; and second, the analysis of movement between occupations is impaired by errors in reporting and coding the relevant data. Nevertheless, the results of the Study should provide valuable inputs into policy decisions affecting manpower.

In general, we found that Canadian mobility rates in the mid-sixties were roughly comparable to those in the mid-fifties. Comparisons with other countries are inherently difficult and should be handled with care, but they can produce some valid findings. For example, it can be stated that industrial mobility in Canada is roughly comparable to that in the United States, but interregional mobility rates are considerably lower.

Comparisons of the various age-sex groups reveal a clear tendency for males to be more mobile than females and for mobility rates to decline with age. Another result, which confirms earlier findings, relates to the differences in mobility behaviour between employed and unemployed persons, i.e., the unemployed are far more

mobile in every aspect, but particularly industrially.[1] In addition, unemployment appears to discourage people from remaining in the insured population. In spite of the special effects of eligibility for unemployment insurance, the pattern of exits from the population covered by unemployment insurance is broadly similar to what we know about the behaviour of the total labour force.

An analysis of interprovincial mobility, which shows gross flows far in excess of net flows, reveals that return migration constitutes about 20 per cent of the annual interprovincial mobility flow. This finding is in line with earlier estimates obtained indirectly.

The general hypothesis used in our analysis of mobility patterns is that people are motivated by income and employment prospects but take into account the overall costs of moving and adjusting. The problems of further specifying this hypothesis for interprovincial mobility data are dealt with at some length; most of these revolve around the various costs of movement represented by the distance variable. The central result is that interprovincial movers do in fact respond to income incentives and that distance does represent much more than just transport costs. Different unemployment rates appear to have little effect on the pattern of interprovincial movement.

Applying this general model to the industrial mobility data is not an easy task because of the many varied "costs of movement" between industries. To attack the problems of identifying and measuring these costs, the labour market is further specified in terms of unionization, sex ratios, and education variables. Moreover, a special dummy variable is created that indicates when two industries are similar in terms of products and work environment -- similarity being associated with smaller mobility costs. The final results provide strong support for our general hypothesis that income and employment opportunity variables are important determinants of industrial mobility.

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[1]This should not be read to mean that an increase in general unemployment raises overall mobility levels. On the contrary, the available evidence suggests a negative relationship between mobility and general unemployment rates. The statement is intended to imply only that *at any one time* unemployed are more mobile than employed.

Our costs of mobility variables help to explain the complex pattern of industrial mobility.

The finding that there is quite a lot of natural mobility in the Canadian labour market should counteract the frequently expressed view that the labour market is inflexible and incapable of absorbing changes. This argument, which is often used to urge the maintenance of a special-interest policy, is clearly fallacious.

Not only does our analysis show a great deal of natural mobility, but it also suggests that mobility flows are determined primarily by economic incentives. One implication is that if certain special-interest policies were abandoned, any resulting unemployment should tend to disappear as workers moved to more promising labour markets.

In addition our findings suggest that there are many costs of movement and adjustment and that these have a striking influence on observed mobility patterns. These costs often relate to individual preferences and to the universal dislike of the unfamiliar. Because costs are, in effect, barriers to natural mobility, adjustment will be slower in some labour markets than in others. However, not all such barriers are necessarily imperfections, nor do substantial costs of movement require an all-out manpower policy with many subsidies and special privileges for movers. Such a policy might end up simply subsidizing the movers at the expense of the stayers. Or it might raise national output without improving social welfare. The conclusion is that, although subsidies may be justified under some circumstances, not all manpower policies improve the general welfare, even if they do manage to raise wages in specific locations.

In general, then, the results of our analysis confirm the view that the labour market works in a reasonably rational and predictable manner. Although problems certainly exist, the allocation process does seem to be fulfilling at least some of its functions. Thus any policy that interferes with allocation has a serious cost attached to it. For instance, a policy of wage controls can prevent an industry from solving labour supply problems by a shift in relative wages and consequent mobility. Such a policy may therefore lead to an increase in the economy's structural imbalances.

APPENDIX A

CONDENSED CLASSIFICATIONS

In the original records, occupations and industries are coded according to the three-digit classifications used for the 1961 Census of Canada. Since these classifications would produce too many elements to construct occupational and industrial mobility matrices of a useful size (about 80,000 elements for each matrix), it was decided to create special condensed classifications for this purpose. In most cases, a condensed group is a combination of a number of three-digit groups. The condensing procedure was based on three criteria:

(1) the size of the condensed group should contain no fewer than 500 persons in our sample of the insured population;

(2) the condensed group should be fairly homogeneous in terms of its representativeness of the insured population in relation to total wage-earners; this provides us with the option of eliminating condensed groups that are poorly representative in our analysis; and

(3) the group should have good linkage possibilities with other data; all 1961 Census of Canada data are, of course, matched, but in the case of some industrial statistics, linkage is more difficult.

The resulting condensed classifications are shown in Tables A-1 and A-2, which give 88 occupational and 73 industrial groups respectively. The numbers after the name of the condensed group indicate the three-digit classes included in the particular group. An asterisk after a name indicates that, in the case of that condensed group, the insured population is poorly representative of the total wage-earners. It will be noticed that two large occupational groups -- managers and professionals -- are not distinguished, since the insured population only covers a small proportion of the total wage-earners in these groups. It can also be seen that, by combining appropriate condensed groups, we can form one-digit classifications of occupations and industries.

Table A-1

CONDENSED OCCUPATIONAL CLASSIFICATION

Name	Code
1. Managers*	001
2. Professionals*	101-181
3. Draughtsmen & surveyors	182-183
4. Accountants, etc.	184-188
5. Miscellaneous professional occupations*	191-196
6. Science and engineering technicians	198
7. Other professionals*	199
8. Bookkeepers & cashiers	201
9. Office appliance operators	203
10. Stock clerks & storekeepers	212
11. Shipping men	214-223
12. Stenographers	232
13. Typists and clerk-typists	234
14. Other clerical	241-249
15. Other sales	301-312
16. Salesmen*	314
17. Attendants	316-323
18. Sales clerks	325
19. Agents*	327-339
20. Police and firemen*	401-403
21. Guards*	405-411
22. Cooks and bartenders	412-414
23. Waiters	415
24. Maids and assistants	416-433
25. Barbers	451
26. Launderers	452
27. Janitors, etc.	453-459
28. Transport foremen & pilots*	510-520
29. Train occupations	531-537
30. Shipsmen	541-547
31. Bus and taxi drivers	551-552
32. Driver-Salesmen	554
33. Truck drivers	556
34. Miscellaneous transport & communications*	561-582
35. Telephone operators	584
36. Mailmen, etc.*	585-588
37. Farm occupations*	601-605
38. Gardeners, etc.*	607-609
39. Loggers	611-615
40. Fishermen, etc.	631-633
41. Miners, etc.	651-656
42. Mine labourers, etc.	657-659
43. Bakers and millers	701-702
44. Butchers	703

(cont'd.)

Table A-1 (concl'd.)

Name	Code
45. Canners	704-706
46. Other food processors	707-709
47. Rubber workers	711-719
48. Leather workers	721-729
49. Spinners and weavers	731-736
50. Other textile workers	737-739
51. Tailors and cutters	741-745
52. Sewers	746
53. Upholsterers, etc.	747-749
54. Carpenters	751
55. Wood machine operators, etc.	752-758
56. Other wood workers	759
57. Paper and pulp makers	761-769
58. Typesetters	771
59. Other printing occupations	772-779
60. Miscellaneous metal workers	781-793
61. Machinists, etc.	801-803
62. Millwrights	805
63. Fitters	806
64. Metalworking machine operators	808
65. Plumbers	810
66. Sheet-metal men	811-815
67. Welders	817
68. Other metal occupations	818-819
69. Car mechanics, etc.	821-822
70. Other mechanics, etc.	824-829
71. Electricians	831
72. Fitters - electrical	832
73. Linemen and other electrical workers	833-839
74. Painters	841-843
75. Construction foremen, etc.	851-852
76. Bricklayers, etc.	854-859
77. Glass workers	861-869
78. Engine men*	871-873
79. Hoist workers	874-875
80. Operators - construction	876
81. Material handling, etc.	877-878
82. Longshoremen	881
83. Warehousemen	883
84. Sectionmen	890
85. Foremen, n.e.s.	900
86. Other workers	911-919
87. Labourers, n.e.s.	920
88. Not specified	980

Table A-2

CONDENSED INDUSTRIAL CLASSIFICATION

Name	Code
1. Agriculture*	001-021
2. Forestry	031-039
3. Fishing	041-047
4. Metal mining	051-059
5. Other mining	061-099
6. Meat production	101-103
7. Dairy production	105-107
8. Canning	111-112
9. Other food	123-139
10. Beverages	141-147
11. Tobacco products	151-153
12. Rubber products	161-169
13. Leather products	172-179
14. Primary textile mills	183-201
15. Miscellaneous textile products	211-229
16. Knitting mills, etc.	231-239
17. Clothing	242-249
18. Sawmills	251
19. Plywood and doors	252-254
20. Furniture, etc.	256-268
21. Pulp and paper	271
22. Other paper	272-274
23. Printing and publication	286-289
24. Iron and steel	291
25. Iron foundries, etc.	292-294
26. Smelting and refining	295
27. Nonferrous metal rolling	296-298
28. Metal stamping and fabric	301-304
29. Miscellaneous metal products	305-309
30. Machinery products	311-318
31. Aircraft	321
32. Car production	323-325
33. Other transport production	326-329
34. Electrical products	331-339
35. Mineral products	341-359
36. Petroleum refineries	365-369
37. Chemical production	371-379

(cont'd.)

Table A-2 (concl'd.)

Name	Code
38. Miscellaneous manufacturing products	381-399
39. Building construction	404
40. Highway construction, etc.	406-409
41. Special trade construction	421
42. Air transport*	501-502
43. Water transport	504-505
44. Railways	506
45. Trucking	507
46. Miscellaneous transport	508-518
47. Storage	524-527
48. Communications	543-548
49. Utilities	572-579
50. Wholesale trade industrial materials*	602-613
51. Wholesale trade consumer products	614-619
52. Wholesale trade machinery, etc.	621-629
53. Food stores	631
54. Department stores	642
55. Variety and general	647-649
56. Car dealers, etc.	652-658
57. Clothing, etc.	663-669
58. Furniture, appliances, etc.	673-678
59. Other retail stores	681-699
60. Banks, etc.	702-704
61. Insurance, etc.	731-737
62. Education*	801-809
63. Health*	821-828
64. Miscellaneous personal services*	831-859
65. Business services	861-869
66. Barbers, etc. (including household help)*	871-873
67. Laundries	874
68. Hotels and restaurants	876
69. Other personal services	876-879
70. Miscellaneous services	891-899
71. Federal and provincial administration*	902-931
72. Local administration, etc.	951-991
73. Not specified*	999

APPENDIX B

ESTIMATION OF ERROR RATES

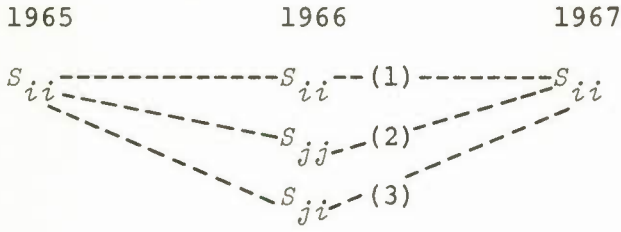
As was indicated in the text (Chapter 2), reporting and coding errors of occupations and industries can have a potentially serious effect by inflating overall mobility rates and by distorting the mobility matrices. If an individual in occupation i, for example, was in 1966 incorrectly coded in occupation j, then this is likely to create false mobility from i to j in 1965-66 and false mobility from j to i in 1966-67. The reason is that the same mistake about this individual is not likely to be made twice, as the annual reporting and coding is done independently from year to year.

In the case of an employed person, the information is reported by the firm in which he is employed; for claimants, the local Unemployment Insurance Commission office provides the information. In both cases, the industry code is based on the name of the firm reported; for claimants, this is the firm of the last job before becoming unemployed. The occupation code is based on a short title of the occupation in which the individual is (or was) last employed as reported by the firm (or by the UIC office). It is known that the instructions about occupational classification issued to the firms and UIC offices are inadequate and that the space allowed for the description of the occupation is insufficient. Neither of these problems afflicts the reporting of industry, because the name of a firm and its business is well-known and easily recorded. We would therefore anticipate that errors in occupational coding will be far more serious than errors in industrial coding.

To get an estimate of coding errors, we use some special tabulations. These tabulations consider all persons in the sample with the same occupation code in 1965 *and* 1967; a matrix shows the occupations in which they were classified in 1966. Similar tabulations are available for industries, both for those years and for the years 1966 *and* 1968, with matrices of industrial coding for 1967. These subsamples cover only part of the total sample -- viz., about 33 per cent in the case of occupations and about 43 per cent for industries --

because so many people leave the insured population or change occupations (or industries) over a two-year period. And the errors themselves often indicate changes where in fact none have been made.

We now make the assumption that all persons identified with a particular occupation i in 1965 *and* 1967 (or 1966 *and* 1968) are correctly identified with occupation i in both of the years. The reason is that the probability of incorrectly identifying the same person with occupation i in two years is very small indeed, because the reporting and coding in different years are done independently. We can then represent the tabulations as follows -- e.g., for occupations for 1965-67:



The symbol S represents the subsample as a proportion of the total sample population. The first subscript refers to the occupation of reported identification; the second subscript, to the *correct* identification. Thus S_{ji} in 1966 shows the number of persons correctly identified with i in 1965 and 1967 who were reportedly identified with j in 1966 but should have been coded i. The S_{jj} element shows return mobility.

The problem now is that the off-diagonal elements in the matrices of these special tabulations represent not only errors (Channel 3) but also return movement (Channel 2). To separate the two, we express return mobility rm as a proportion k of the true occupational mobility rate b.

$$rm = kb. \qquad (1)$$

If a is the true proportion of the population that does not change occupation and n is the proportion of the population that leaves the insured population, then

$$a + b + n = 1.$$

In our special tabulations, we capture only the part of rm that is coded correctly in the two end years -- e.g., 1965 and 1967 (call this rmc). Then

$$rmc = kb(1-e) \tag{2}$$

in which e is the error rate. The error rate e is the sum of two components e_1 and e_2, which measure the proportions of the subsamples that were allocated to the wrong occupations in the first and second years respectively. In other words, the total amount of incorrect mobility between two years is the total of incorrect codings in the first year plus the incorrect codings in the second year. This follows more or less directly from the assumption that the probability of incorrectly identifying the same person with a particular occupation in two years is small enough that it may be ignored. The effect of e on the various mobility rates will be further explored below.

The numerical estimates show that the component error rates e_1 and e_2, measured for the two years 1966 and 1967, are very similar. We shall therefore assume that

$$e_1 = e_2 = \frac{e}{2}. \tag{3}$$

In addition to rmc, the off-diagonal elements in our special tabulations therefore contain $e_1(S-rmc)$. Or if we call Q the sum of all off-diagonal elements in the special tabulations as a proportion of the total sample population:

$$Q = rmc + \frac{e}{2}(S-rmc). \tag{4}$$

We recall that S is the total subsample population as a proportion of the total sample population. Using equation (2), we may write this as

$$Q = \frac{e}{2}S + (1-\frac{e}{2})(1-e)kb. \tag{5}$$

The first expression on the right represents the error part; the second, the return mobility part of the off-diagonal elements. It can be seen from equation (5) that the maximum values attainable by e and k, both of which are positive fractions, occur when $k = 0$ and $e = 0$ respectively. Thus

$$k_{max} = \frac{Q}{b}. \qquad (6)$$

Equation (6) states that if the error rate is zero, our special tabulations only capture return mobility in the off-diagonal elements. This technique was, in effect, applied to obtain the return migration figures reported in Chapter 5. It is assumed for this that no errors are made in the coding of province of employment, so that the special tabulations for interprovincial mobility only show return migrants in the off-diagonal elements.

The value of k_{max} for industrial mobility is about .11. Since it was argued above that there is little reason to expect errors in the industrial coding, we shall assume that the actual return mobility rate k for industries is .1. This means that there is little room left for errors, and using equation (5), it can in fact be calculated that with a 10 per cent return mobility proportion, the industrial error rate is less than 2 per cent. It is therefore assumed that industrial coding errors are sufficiently unimportant that they may be ignored. The industrial mobility figures reported throughout this Study are therefore directly derived from the original mobility matrices.

To obtain an estimate of the occupational error rate, we shall assume that return mobility between occupations is as important as between industries. In other words, we assume that $k = .1$ for occupations, which means that of the true occupational mobility in a year 10 per cent is return mobility to occupations occupied in the preceding year. The reasoning behind this is that it is difficult to argue that the phenomenon of return mobility should be much more important in the case of occupations than industries. Using this assumption, equation (5) can be employed to calculate the error rate e. Of the various parameters in (5), only b is not directly observable, but it is related to the observed mobility rate b', as follows.

$$b = b' - ea = b' - \frac{ea'}{1-e}. \qquad (7)$$

In equation (7), b' is the observed mobility rate (including errors) and a' is the observed proportion of the population that records no change (also including errors). When errors are made, the no-change proportion of the population is reduced by a quantity ea, which is added

to the mobility rate. This will be further explored below.

Substituting (7) into (5) gives

$$Q = \frac{e}{2}S + k(1-\frac{e}{2})(1-e)(b' - \frac{ea'}{1-e}). \qquad (8)$$

This is a quadratic equation in which e has the following solution

$$e = \frac{-Y + \sqrt{Y^2 - 4XZ}}{2X} \qquad (9)$$

and in which X, Y, and Z are complex parameters, as follows:

$$X = k(a' + b')$$

$$Y = S - k(3b' + 2a')$$

$$Z = 2(kb + Q).$$

Using the following actual values for the parameters,

a' = .4626 for 1966-67

b' = .2916 for 1966-67

S = .3300 average for 1965-67 and 1966-68

Q = .0525 average for 1965-67 and 1966-68

k = .1,

it is calculated that e = .273. This error rate is used in the various corrected mobility rates reported in the text. It has been implicitly assumed in the argument presented above that the error rate of the subsample applies to the whole sample. In the corrections appearing in the text of this Study, the explicit assumption is made that this occupational error rate of .273 also applies to various subgroups of the sample in 1966-67 and to different years (see also Appendix C).

At one point it was thought that this technique for estimating the overall error rate could also be applied to each and every one of the elements of the occupational

mobility matrix in order to obtain a corrected mobility matrix. But the additional assumptions that are necessary to make this workable are so numerous that the task would be too heroic for the scope of this Study. This attempt was therefore abandoned, as the resulting mobility matrix would possibly be as unreliable as the original one.

Once we have the overall error rate, we can correct the various mobility rates. To show how this is accomplished, we construct a scheme (which is shown below, together with a hypothetical example) in which the true mobility rates are known (indicated by ordinary letters *a*, *b*, *c*, *d*, *f*, etc.), and the effect of occupational errors is traced to the observed rates (indicated by primed letters *a'*, *b'*, etc.).

True Mobility Rates		Errors (e = .2)	Effect of Errors
a - no change	.45	.09	*a'* = .36
b - occupation	.05	.01*	*b'* = .14
c - industry	.10	.02	*c'* = .08
d - province	.05	.01	*d'* = .04
f - occupation and industry	.10	.02*	*f'* = .12
g - occupation and province	.03	.006*	*g'* = .04
h - industry and province	.02	.004	*h'* = .016
i - all three	.05	.01*	*i'* = .054
n - leave insured population	.15	--	*n* = .15
	Sum = 1.00		Sum = 1.000

In the column headed "errors", the relevant numbers are "arrowed into" the appropriate category of the observed rates. The figures with asterisks are ignored because, in cases where true mobility is recorded, errors may affect the observed direction but not the observed overall mobility rates. This is one of the reasons why it is much more difficult to correct the individual elements of the occupational mobility matrix.

Since we do not know the true mobility rates (*a*, *b*, *c*, etc.) we must calculate them from the observed error rates (*a'*, *b'*, *c'*, etc.). From the example, we can derive the following conversion formulas:

$$\left.\begin{aligned} a &= \frac{a'}{1-e} \\ b &= b' - ea \\ c &= \frac{c'}{1-e} \\ d &= \frac{d'}{1-e} \\ f &= f' - ec \\ g &= g' - ed \\ h &= \frac{h'}{1-e} \\ i &= i' - eh \\ n &= n. \end{aligned}\right\} \qquad (10)$$

The formulas in equation (10) are used in a variety of forms in the text in calculating corrected mobility rates.

The method outlined in this Appendix provides us with a reasonable estimate of the occupational error rate. The most difficult assumption in the chain of argument is that occupational return mobility is 10 per cent of total occupational mobility. While this assumption is not implausible, it is not easy to verify empirically. As additional assumptions would be necessary to obtain corrected mobility matrices, and since the error rate is quite large, we do not report or analyse the occupational mobility patterns. The contents of Chapter 6 are therefore restricted to a general description of overall occupational mobility rates.

APPENDIX C

ADJUSTMENTS TO EARLIER MOBILITY RATES

Information on mobility rates of Canada's insured population is available for the period 1952 to 1960 (for sources, see footnote 3 of Chapter 2). The data are not exactly comparable to those we used in this Study, and this Appendix discusses the discrepancies and reports the adjustments required to bring the earlier data into line with the recent ones for 1965-68. Unadjusted, the overall mobility rates, expressed as a percentage of the number of persons remaining in the insured population, were as follows:

1952-53	54%	1956-57	54%
1953-54	54%	1957-58	50%
1954-55	56%	1958-59	41%
1955-56	59%	1959-60	45%.

There are five points of difference with the data for 1965-68, and in some instances we can make adjustments to bring the two sets more into line.

1. The earlier data are based on a 1 per cent sample of the insured population instead of a 10 per cent sample. While the smaller sample will increase the sampling error, it does not impart any systematic bias to the overall mobility rates.

2. For the period 1952-56, no new cases were added to the initial 1 per cent sample drawn in 1952 (see *Canadian Statistical Review*, July 1960), and the effect of using only the original sample is difficult to assess. Our recent data suggest that new entrants into the insured population have a somewhat higher probability of becoming unemployed than those who remain in the insured population from year to year. Furthermore, unemployed persons have a higher mobility rate than employed persons, suggesting that the overall mobility rates for 1953-54, 1954-55, and 1955-56 should be somewhat higher than reported. But it is not possible to adjust to solve this problem and, in any case, the upward adjustment would probably only be a small fraction of 1 per cent.

3. The data for 1956-60 do not include any claimants. The recent data suggest that the uncorrected overall mobility rate for unemployed is about 60 per cent higher than for employed persons. Adopting the following claimant rates -- 1956-57, 4 per cent; 1957-58, 6 per cent; 1958-59, 7 per cent; and 1959-60, 6 per cent -- the adjustments required for the overall mobility rates are as follows: 1956-57, +1.3 per cent; 1957-58, +1.8 per cent; 1958-59, +1.8 per cent; and 1959-60, +1.6 per cent.

4. The data for 1952-60 include intraprovincial mobility -- i.e., movement between local office areas within the same province, whereas the recent data consider only changes in the province of employment. The simple unidimensional local office area mobility rate (multidimensional moves involving the local office area aspect should be ignored for this purpose) for 1956-58 was about 2.9 per cent. Allowing for occupational coding errors (see Appendix B), the local rate would be about 3.9 per cent, compared with an interprovincial rate of about 1.1 per cent. To adjust for the inclusion of intraprovincial mobility, all the mobility rates for the years 1952-60 are therefore reduced by 2.8 per cent (3.9 - 1.1 per cent).

5. The data for 1952-60 do not take coding errors into account. Incorporating the adjustments of the last two sections results in the following uncorrected mobility rates:

1952-53	51.2%	1956-57	52.5%
1953-54	51.2%	1957-58	49.0%
1954-55	53.2%	1958-59	40.0%
1955-56	56.2%	1959-60	43.8%.

These figures are inflated by reporting and coding errors regarding occupations. On the assumption that the error rate estimate for 1966-67 is also applicable to these earlier years, we obtain the following correction formula for R, the overall mobility rate (see Appendix B).

$$R = \frac{R' - e}{1 - e}. \qquad (11)$$

This formula is directly obtained from the definitions of the corrected overall mobility rate $R = \frac{1 - a - n}{1 - n}$ and the uncorrected rate $R' = \frac{1 - a' - n}{1 - n}$. Applying the

formula to the uncorrected data gives us the figures in Table 3-2 of Chapter 3. It is clear from the foregoing description that the adjustment procedure is quite rough and ready. While large changes in mobility rates are probably broadly in correspondence with reality, any minor year-to-year variations are of doubtful significance. In Chapter 2, the possibility was considered that the occupational error rate may to some extent vary with the industrial mobility rate, because a change of employer is more likely to lead to a reporting error. If this is true, it means that our corrected overall mobility rate is somewhat on the low side in years when the industrial mobility rate was low -- e.g., in 1958-59.

APPENDIX D

INDUSTRIAL MOBILITY MATRICES, 1965-68

This Appendix reports the basic industrial mobility data in matrix form, using the condensed industrial classification (see Appendix A). In each "cell" there are three observations for the three years 1965-66, 1966-67, and 1967-68 in that order. The data are reported row by row; a row represents the number of persons in the sample in a particular industry in the first year who were in different industries in the second year. Thus the 12th element for industry 8 represents the number of people in the sample who moved from industry 8 in the first year to industry 12 in the second year. For each industry, we also report the total sample population in that industry in the first year, the number of stayers who did not change industry, and the number of exits -- persons leaving the insured population during the year.

INDUSTRY 1	POPULATION	981 1128 1997	STAYERS	385 423 899	EXITS	283 373 634

0	4	0	0	2	10	1	3	12	3	2	1	3	4	0	1
0	10	0	0	5	9	4	4	20	1	1	0	0	1	2	0
0	12	0	3	4	9	6	2	7	1	4	1	3	2	1	0
2	5	4	3	2	0	0	0	1	2	0	4	4	5	0	3
3	8	5	1	3	1	0	1	1	1	2	0	2	4	1	4
2	11	5	4	0	0	1	1	2	1	1	6	6	3	0	9
4	6	6	0	4	3	22	9	21	0	3	2	5	6	1	0
3	2	3	0	0	1	23	12	19	2	0	6	13	3	2	3
2	3	5	0	4	8	24	28	22	0	2	3	11	8	1	2
4	2	24	19	3	2	1	8	0	5	3	0	7	3	3	6
1	3	34	21	2	2	2	8	0	0	5	1	4	1	3	9
5	2	30	59	4	6	5	13	2	2	11	1	6	6	4	4
4	1	3	11	2	7	2	11	9							
4	3	2	13	0	3	6	11	8							
5	2	1	22	0	11	5	13	15							

INDUSTRY 2	POPULATION	6615 6979 6495	STAYERS	3108 3042 2843	EXITS	1928 2491 2240

11	0	17	30	28	1	7	10	6	1	0	2	1	8	3	0
21	0	34	29	18	3	11	9	5	5	0	2	1	0	2	1
26	0	29	29	29	4	4	15	7	3	0	0	0	3	1	0
1	312	43	9	157	7	1	2	3	7	6	10	6	4	0	5
0	310	18	10	69	6	3	3	4	11	2	8	4	5	3	3
1	318	17	11	126	3	0	0	2	5	0	0	7	5	3	1
5	5	5	0	9	3	123	111	67	3	23	23	35	31	4	2
5	6	8	0	3	6	92	89	64	2	41	24	74	44	2	4
5	3	12	0	1	1	73	82	45	3	13	11	41	17	0	3
21	5	7	52	8	4	7	31	1	3	7	4	3	5	3	4
21	8	12	42	6	2	11	41	0	5	2	4	6	8	2	5
25	2	10	40	6	4	10	28	0	2	5	5	5	8	2	7
9	0	4	30	5	14	39	81	85							
9	0	4	36	7	16	30	77	28							
5	1	1	18	1	9	107	71	81							

INDUSTRY 3	POPULATION	1885 2242 1938	STAYERS	1019 1012 773	EXITS	564 753 849

1	21	0	3	10	0	0	76	3	1	0	0	0	1	0	0
2	29	0	5	8	1	1	65	2	1	0	0	0	0	0	0
3	16	0	2	3	0	0	64	0	0	0	0	0	1	0	0
0	1	1	1	3	0	0	0	2	1	1	2	2	1	0	2
0	8	1	2	2	2	0	0	0	1	0	2	1	0	0	0
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
5	1	2	0	0	0	23	12	12	0	8	4	9	7	1	1
5	4	1	0	1	2	38	29	20	0	21	4	3	40	0	3
5	1	1	0	0	1	23	13	17	2	16	1	4	7	0	0
1	1	7	5	1	0	9	3	0	0	0	0	0	0	2	1
4	2	13	13	3	0	12	3	0	1	0	2	2	2	1	4
4	0	20	3	2	0	6	4	0	4	1	1	0	0	3	3
2	2	0	3	1	3	26	6	11							
0	0	0	4	0	3	47	42	15							
0	1	1	2	2	2	28	10	36							

INDUSTRY 4 POPULATION 5243 4862 5282 STAYERS 3297 3287 3481 EXITS 1016 1001 984

1	28	0	0	76	1	1	0	4	1	1	1	0	1	3	1
3	26	1	0	83	1	6	1	5	3	0	3	2	0	2	1
4	17	1	0	67	0	2	3	5	3	0	3	0	0	3	0
0	9	8	1	9	1	2	5	4	390	4	11	10	5	4	19
1	19	3	2	8	3	3	12	5	59	3	3	6	5	4	10
0	15	5	4	7	2	1	24	4	368	1	4	2	2	0	6
2	5	8	1	6	0	37	60	25	4	4	14	12	9	0	6
2	3	6	4	7	5	22	38	21	2	7	12	17	7	2	5
1	2	5	0	5	3	14	31	23	3	2	8	12	10	0	4
2	1	2	17	6	2	0	23	0	1	2	6	2	3	1	1
7	1	5	12	3	1	2	13	0	2	1	4	4	2	2	0
8	2	5	16	8	2	0	14	1	1	1	2	2	5	1	1
6	1	0	13	0	6	8	16	17							
7	1	0	12	0	8	15	9	20							
12	0	1	12	1	6	12	8	20							

INDUSTRY 5 POPULATION 3997 4008 4308 STAYERS 2267 2446 2607 EXITS 1000 965 1094

7	13	2	54	0	0	2	0	4	1	0	0	1	2	4	1
5	27	1	56	0	0	5	1	8	3	0	0	0	0	1	1
8	17	4	53	0	1	2	1	9	3	0	3	1	0	2	1
0	7	0	4	7	1	0	2	2	5	0	6	8	13	3	7
0	9	5	3	7	3	2	4	1	1	1	4	5	7	2	4
0	15	4	4	8	1	3	6	2	4	0	5	5	8	0	9
4	6	145	9	3	1	34	110	44	1	7	4	25	10	1	1
2	5	31	3	8	3	29	86	33	1	2	6	33	22	2	2
1	1	42	11	2	2	30	59	26	2	5	8	38	12	1	3
2	10	2	26	3	3	4	22	2	1	7	1	2	2	1	1
8	4	3	32	3	3	3	11	0	0	3	5	1	6	4	3
23	5	3	26	2	1	3	21	1	4	3	17	2	5	2	2
20	0	0	9	1	7	7	16	20							
31	0	1	8	1	4	9	12	8							
22	0	1	6	1	7	4	9	15							

INDUSTRY 6 POPULATION 2970 3048 3060 STAYERS 2024 2018 1972 EXITS 558 705 683

3	7	0	3	0	0	9	9	21	2	0	8	3	2	5	2
9	1	1	1	0	0	7	9	10	3	2	0	1	4	4	1
25	4	0	1	2	0	11	10	45	3	1	3	3	2	1	1
8	2	2	3	2	3	1	2	0	3	1	3	8	4	1	4
2	5	1	6	1	4	4	1	0	2	0	2	4	4	0	2
5	3	1	2	2	2	2	1	0	1	2	4	5	3	0	6
2	8	8	2	40	9	5	5	12	0	0	0	5	2	8	1
1	4	1	0	6	3	6	2	4	0	2	3	10	7	0	4
3	5	0	0	3	6	5	6	13	0	0	2	3	3	1	1
1	2	40	8	36	5	5	1	2	1	3	6	5	1	4	0
2	2	63	11	20	2	3	9	1	3	5	4	4	3	2	0
3	3	89	13	18	2	3	8	1	4	1	7	4	3	1	2
5	0	3	14	0	5	5	4	4							
5	0	4	14	0	7	3	5	9							
7	0	3	15	0	5	1	6	4							

INDUSTRY 7	POPULATION	3155 3220 2982	STAYERS	2122 1988 1927	EXITS	566 747 659

6	4	0	3	7	13	0	5	49	9	0	3	1	2	2	1
7	1	0	2	6	20	0	6	27	11	0	3	0	5	4	0
10	1	0	3	3	12	0	4	31	4	0	0	0	4	4	1
0	3	3	3	4	5	8	5	3	0	4	9	6	6	3	7
2	1	2	6	2	9	5	1	2	2	1	6	7	5	2	3
3	3	4	6	3	3	2	5	0	2	1	3	3	1	0	8
4	15	9	0	7	4	14	9	16	0	0	7	16	10	2	4
0	11	0	0	5	6	8	6	8	0	2	5	29	20	5	5
3	8	5	0	3	4	8	6	9	0	2	2	23	14	1	3
3	0	15	16	11	6	11	16	1	4	5	7	5	8	2	6
3	4	19	23	22	7	15	15	4	6	7	6	1	18	4	3
2	5	14	23	17	6	10	16	3	4	3	7	4	7	2	5
7	0	7	19	0	11	6	7	3							
5	1	3	21	1	8	12	10	9							
3	0	4	13	0	8	4	13	8							

INDUSTRY 8	POPULATION	2832 3264 3215	STAYERS	1658 1756 1784	EXITS	696 1002 1015

5	8	63	2	5	15	2	0	23	0	0	2	4	2	4	0
3	13	69	3	5	7	1	0	24	2	3	3	2	0	6	2
27	5	54	3	3	5	3	0	26	4	2	0	0	4	0	1
7	5	2	1	2	4	3	3	1	2	0	9	5	5	2	6
3	2	1	10	1	3	0	4	1	1	2	7	6	4	1	12
0	3	3	6	3	1	0	1	0	1	0	3	4	3	0	10
8	5	3	0	2	6	25	12	14	0	13	3	6	7	3	2
4	8	3	1	5	2	11	16	16	1	9	5	8	11	3	1
3	1	3	0	3	2	17	6	14	0	14	1	11	7	3	4
1	1	32	11	12	1	30	12	0	2	2	2	2	2	5	1
4	0	62	11	18	5	5	11	0	1	3	6	2	3	3	4
2	1	42	9	9	3	7	7	2	0	3	2	1	1	5	2
1	2	3	18	0	1	2	8	26							
2	0	5	29	2	3	5	8	9							
7	0	0	15	0	6	6	4	18							

INDUSTRY 9	POPULATION	7479 7423 8227	STAYERS	4761 4871 4719	EXITS	1559 1522 2008

8	15	1	6	4	21	40	22	0	15	1	8	6	12	7	7
10	7	2	5	6	15	38	17	0	10	3	8	6	5	5	6
22	8	1	3	2	12	23	15	0	9	1	4	6	10	6	4
14	9	12	19	5	11	8	7	6	5	3	20	21	17	3	29
13	7	5	17	11	11	9	5	2	4	4	14	12	9	10	13
14	6	6	3	5	5	6	1	5	3	2	13	13	4	1	18
4	29	5	0	37	16	28	12	34	0	0	17	29	16	3	10
5	35	4	2	23	17	15	7	25	2	7	11	32	19	5	12
6	15	15	1	32	18	14	13	24	4	1	5	27	513	4	9
5	6	88	75	75	23	28	19	4	8	15	8	11	11	3	8
4	16	72	57	64	21	23	18	15	8	11	11	15	12	8	8
7	7	63	76	115	20	18	30	11	7	17	14	8	15	6	7
15	2	14	72	2	16	14	13	22							
20	2	7	56	2	18	11	14	27							
15	2	9	51	0	21	10	14	25							

INDUSTRY 10	POPULATION	2187 2354 2428	STAYERS	1527 1600 1653	EXITS	401 475 528

1	2	0	3	2	4	5	1	13	0	0	1	2	6	3	2
1	0	0	2	3	3	5	1	10	0	0	2	1	2	3	1
4	1	0	1	3	3	3	2	13	0	0	0	2	3	1	1
3	2	3	2	3	1	5	1	1	5	1	5	0	2	0	1
4	0	1	6	3	2	4	1	0	2	1	1	5	2	2	10
3	5	0	2	1	2	3	0	0	2	1	2	3	3	0	10
3	2	2	0	5	3	5	8	8	2	4	5	11	6	0	4
2	5	2	0	11	3	6	2	10	0	5	9	7	5	1	3
1	8	7	1	2	3	3	4	9	0	1	1	7	4	3	0
0	0	12	14	6	3	3	10	0	3	6	4	4	2	1	1
0	2	15	18	5	4	4	11	2	4	6	5	5	5	0	1
1	0	9	15	5	6	1	13	1	2	5	6	5	1	0	7
7	2	0	9	0	9	4	4	7							
7	0	2	12	0	6	6	3	7							
7	0	1	12	0	6	4	10	2							

INDUSTRY 11	POPULATION	896 873 871	STAYERS	698 697 617	EXITS	147 120 178

0	0	0	0	0	2	1	2	1	0	0	0	0	0	0	0
2	0	2	0	0	1	0	2	3	0	0	0	0	1	1	0
4	0	0	0	0	1	1	2	0	0	0	1	1	1	0	0
0	0	0	2	0	0	1	0	0	0	0	1	0	3	1	2
0	0	0	1	0	1	1	0	0	0	1	0	4	1	0	2
0	0	0	0	0	1	1	0	1	0	0	2	2	0	0	1
0	2	3	0	2	1	4	0	0	0	0	0	1	0	0	0
0	2	0	0	1	0	1	0	1	1	0	0	0	0	0	0
0	1	0	1	0	0	0	1	0	0	0	0	1	2	0	1
0	1	0	4	2	1	0	1	3	0	0	1	1	1	0	1
0	0	0	3	1	2	0	1	0	0	0	1	2	2	0	1
1	0	25	1	0	3	1	1	0	2	1	2	1	1	0	1
0	0	0	3	1	1	0	0	1							
0	0	0	0	1	1	0	2	10							
1	0	0	0	0	1	0	3	5							

INDUSTRY 12	POPULATION	2268 2397 2278	STAYERS	1605 1467 1587	EXITS	403 549 422

0	1	0	1	0	3	1	0	1	3	0	0	16	1	4	2
1	2	0	1	5	3	3	1	8	4	1	0	19	7	7	6
1	1	0	3	1	2	0	2	5	0	1	0	10	5	16	4
0	0	0	3	0	9	3	5	3	0	0	9	14	7	3	13
3	1	0	2	2	0	2	5	1	2	1	1	14	8	2	24
1	0	0	1	1	2	1	2	0	0	1	4	4	6	1	11
1	8	3	0	6	5	10	6	6	2	0	3	4	1	0	5
1	12	5	1	7	16	4	3	12	0	1	3	7	4	0	2
2	6	3	0	3	7	2	0	6	0	0	1	6	5	1	1
2	2	8	11	2	0	0	33	0	5	2	1	3	3	2	2
2	2	42	13	2	5	1	50	3	1	0	4	3	1	4	0
3	1	13	12	3	1	2	57	1	0	2	4	2	0	2	1
3	1	1	4	0	2	2	7	2							
4	0	0	12	0	5	0	6	7							
7	0	1	7	0	6	0	5	10							

INDUSTRY 13	POPULATION	3001 2990 2918	STAYERS	1938 1952 1900	EXITS	650 644 662

1	0	0	0	1	4	2	1	9	1	1	48	0	8	7	3
3	1	1	0	0	4	3	3	15	1	0	20	0	4	12	4
3	0	0	0	1	0	0	2	9	1	2	13	0	4	6	2
44	1	0	10	2	9	5	3	1	0	1	13	12	6	0	10
27	0	1	9	8	7	3	1	0	2	1	12	13	11	3	4
20	1	4	11	23	3	3	0	1	0	0	10	9	8	1	4
3	22	2	0	0	21	5	7	14	0	1	1	9	1	0	1
4	13	4	0	3	36	7	1	2	0	0	5	5	0	0	3
3	17	2	0	4	54	7	2	4	0	0	1	3	1	0	6
1	1	10	14	12	6	4	8	6	4	6	2	4	2	1	3
2	2	18	11	8	5	2	3	10	4	6	3	1	5	1	3
1	1	11	11	8	2	3	8	4	3	6	1	1	1	1	2
4	2	4	13	0	5	3	1	7							
7	4	5	17	0	6	2	1	12							
2	3	2	15	0	9	0	5	11							

INDUSTRY 14	POPULATION	4534 4688 4470	STAYERS	3301 3361 3344	EXITS	744 761 774

4	4	5	1	0	5	4	9	13	2	0	9	5	0	38	13
5	5	1	2	0	4	7	3	19	8	1	5	11	0	57	15
4	2	0	0	1	5	2	3	7	2	0	5	8	0	22	17
12	0	3	13	5	4	6	6	2	4	1	11	11	4	1	12
12	7	3	12	8	8	4	3	2	1	5	11	9	11	1	4
8	3	8	9	1	5	2	1	1	3	0	6	5	7	0	8
4	21	32	0	17	12	13	8	10	0	1	3	11	1	1	5
7	31	9	2	30	17	6	5	17	3	0	6	9	6	0	6
7	7	3	1	7	10	5	8	10	0	1	0	1	2	1	3
0	0	10	10	9	1	2	10	0	6	3	6	6	4	2	2
1	2	15	10	16	0	4	13	5	5	5	5	5	3	2	6
1	3	16	11	6	2	1	8	2	3	7	3	5	6	1	2
7	5	8	20	0	6	6	8	12							
9	1	3	13	0	8	7	9	21							
5	0	3	19	0	16	2	6	13							

INDUSTRY 15	POPULATION	2228 2503 2420	STAYERS	1369 1444 1561	EXITS	467 623 479

3	1	0	0	0	0	2	1	7	0	0	5	8	58	0	7
1	2	0	2	1	2	1	2	11	2	0	9	4	41	0	29
2	1	0	2	0	1	3	2	9	2	0	3	5	48	0	16
23	1	1	17	1	4	5	3	0	2	0	6	11	8	2	4
36	0	1	14	1	11	6	2	3	2	1	3	12	4	1	10
35	0	0	5	0	23	3	1	3	3	0	5	9	9	1	5
2	14	5	0	3	17	8	4	12	0	0	5	5	0	1	2
2	12	5	1	6	22	4	2	10	2	0	6	10	4	1	2
4	9	1	0	3	13	4	5	6	2	2	0	10	1	2	1
2	2	22	21	5	3	0	8	3	5	4	1	3	2	3	6
2	2	9	13	9	9	3	8	7	4	3	1	1	5	3	3
1	2	9	23	3	1	1	8	7	7	2	4	8	1	3	2
5	0	6	18	1	6	2	3	3							
3	3	6	8	3	3	2	7	16							
2	0	6	10	0	3	3	2	13							

INDUSTRY 16	POPULATION	1974 2219 2011	STAYERS	1266 1289 1269	EXITS	438 633 492

1	1	0	0	0	2	1	0	2	1	0	2	5	22	31	0
0	1	0	1	0	3	2	1	9	1	0	2	23	27	9	0
1	0	0	0	0	2	0	3	2	1	0	5	8	13	12	0
78	0	1	2	0	1	5	2	0	1	0	5	5	0	1	7
52	1	3	5	2	2	3	1	0	1	0	6	4	6	1	7
93	0	1	4	0	4	1	1	1	0	0	0	4	1	0	3
3	7	3	0	3	7	2	4	2	0	0	2	0	1	0	1
3	14	1	0	3	8	1	1	2	0	0	0	0	1	0	1
0	5	3	0	3	5	1	0	1	0	0	0	2	1	0	2
0	1	2	3	4	4	4	2	4	1	1	0	4	2	2	0
2	1	10	2	7	3	2	4	8	1	3	2	3	2	0	1
1	1	12	1	5	0	6	2	4	0	1	3	0	2	2	1
2	3	6	6	0	1	2	0	5							
3	0	3	13	0	5	1	2	11							
2	0	2	12	1	3	0	1	5							

INDUSTRY 17	POPULATION	9221 9333 9140	STAYERS	6269 6384 6105	EXITS	2102 2210 2323

1	2	0	1	1	6	5	4	21	6	3	4	32	19	63	75
1	1	0	1	0	7	4	6	16	3	0	4	29	14	31	75
3	0	0	0	0	3	1	3	22	0	1	5	28	12	44	65
0	1	4	30	4	10	10	2	0	1	0	10	9	3	2	3
0	2	2	16	1	8	12	0	0	0	0	6	9	14	4	6
0	1	3	15	0	9	5	1	1	0	0	3	6	3	3	4
1	16	5	3	8	29	5	8	15	1	2	1	6	9	0	9
2	26	4	1	5	31	0	1	4	0	1	0	6	0	0	9
2	16	2	0	6	30	4	2	7	0	0	1	4	2	0	4
1	0	21	15	15	17	7	9	105	6	9	10	11	0	6	3
0	8	31	18	15	17	12	9	64	6	5	5	13	6	13	4
3	3	30	11	12	11	13	7	108	8	6	11	11	2	8	1
11	8	27	51	10	11	2	4	41							
9	7	30	47	3	6	7	2	40							
9	1	15	55	2	20	2	5	37							

INDUSTRY 18	POPULATION	4185 4089 4244	STAYERS	2212 2146 2401	EXITS	836 996 1023

5	312	3	27	17	4	2	3	4	5	0	1	2	3	0	1
19	269	2	13	14	3	1	6	12	1	0	1	0	2	2	1
19	230	3	8	7	0	4	3	2	0	0	0	2	1	1	0
2	0	158	33	53	2	2	1	3	13	2	3	4	5	1	1
0	0	105	27	54	1	2	1	1	6	1	3	4	4	0	3
1	0	105	21	29	0	0	1	0	2	1	2	4	2	0	4
5	4	10	0	7	1	47	40	35	0	11	15	27	10	1	1
2	1	6	1	2	1	33	36	34	0	20	17	30	13	1	1
3	3	7	0	2	1	26	24	29	0	4	14	12	11	2	5
10	0	2	70	4	3	8	25	3	6	4	1	0	4	0	5
11	2	11	27	9	5	6	19	0	5	0	3	2	5	4	4
9	2	12	51	6	5	4	18	0	1	11	7	0	8	3	1
7	1	2	15	0	9	7	26	39							
7	1	0	8	0	6	11	32	13							
12	2	0	14	0	7	8	21	23							

INDUSTRY 19 POPULATION 2728 STAYERS 1495 EXITS 570
2957 1523 611
2528 1436 617

6	42	4	7	5	2	5	2	5	2	0	3	3	13	2	0
8	49	1	7	3	6	4	1	10	1	0	2	3	8	4	2
2	23	0	3	6	1	2	3	5	3	0	3	1	7	5	1
3	85	0	66	14	1	0	2	2	2	0	25	11	8	1	5
7	216	0	72	12	5	3	5	3	3	1	7	7	11	2	14
1	81	0	36	7	0	4	3	0	1	0	11	4	1	0	5
0	8	7	0	8	11	37	13	29	0	2	4	14	1	2	4
4	10	4	1	3	5	42	8	27	1	5	6	13	6	1	2
4	3	13	0	1	8	46	9	18	1	0	3	7	0	0	2
2	3	4	88	8	3	3	9	0	6	6	1	3	4	0	4
7	5	9	84	9	5	2	7	2	5	2	1	4	5	3	1
5	0	7	32	4	3	4	5	0	5	3	4	1	4	2	1
7	0	1	10	1	8	7	7	12							
5	4	1	10	0	4	8	17	8							
3	2	1	11	1	7	3	6	27							

INDUSTRY 20 POPULATION 4325 STAYERS 2667 EXITS 821
4548 2837 953
4661 2933 1002

4	16	1	7	3	2	3	0	11	6	1	7	10	9	17	1
10	10	1	5	5	2	10	1	11	5	3	5	9	6	13	3
11	14	1	8	4	6	3	2	8	2	2	6	4	11	11	5
18	25	93	0	6	15	13	1	4	0	7	29	33	23	6	14
12	24	31	0	4	14	10	4	3	2	5	41	42	19	7	27
6	32	41	0	2	11	10	5	5	8	2	18	33	7	3	16
12	37	9	0	3	25	55	13	51	0	1	15	17	3	2	4
10	23	10	1	9	29	33	13	35	2	3	10	16	8	4	4
5	23	25	0	11	31	27	18	30	2	3	5	14	5	0	2
4	2	14	37	13	3	1	16	5	15	3	4	5	7	4	1
4	3	17	38	7	4	5	24	5	16	5	3	3	7	3	4
2	3	10	37	9	6	8	18	3	12	6	6	10	5	4	3
9	2	3	14	0	16	2	10	15							
11	0	3	13	1	6	2	2	18							
8	0	4	17	1	10	4	24	18							

INDUSTRY 21 POPULATION 6753 STAYERS 5523 EXITS 832
7140 5638 1021
7020 5431 1166

2	56	1	8	3	1	4	3	1	2	1	2	1	2	0	0
0	71	0	5	1	0	0	6	2	1	0	2	1	2	0	0
2	42	5	4	5	0	1	1	6	1	0	2	0	9	1	1
1	29	6	3	0	24	6	1	1	3	0	4	6	3	0	13
0	79	6	6	0	64	3	4	0	4	1	5	4	2	5	0
0	51	6	5	0	44	2	1	1	0	0	2	2	1	0	15
4	6	3	1	12	2	18	8	12	0	0	17	5	5	1	3
3	2	2	1	2	0	20	14	22	1	13	7	8	4	2	1
2	3	1	0	5	2	14	10	14	0	5	10	6	5	0	0
9	2	2	17	3	2	5	8	1	2	5	4	1	4	2	2
5	1	4	18	2	4	1	4	0	4	2	5	4	4	1	1
8	1	3	10	4	6	4	14	2	1	4	9	5	9	2	1
5	0	0	6	0	4	7	6	17							
5	1	2	12	2	6	7	6	4							
6	0	1	11	0	6	7	9	13							

INDUSTRY 22	POPULATION	2950 2887 3148	STAYERS	1855 1853 1893	EXITS	569 627 805

0	2	0	0	2	1	4	1	5	2	0	3	2	2	12	0
0	2	0	1	2	2	2	2	13	4	3	11	5	3	3	1
3	0	0	2	0	3	1	1	8	5	1	3	3	3	5	3
4	2	1	20	53	0	67	5	1	0	4	10	16	17	4	7
4	0	2	7	36	0	27	3	1	2	1	10	6	5	2	2
0	2	0	7	82	0	35	0	1	1	5	10	13	4	2	5
2	21	8	0	12	50	7	5	12	1	1	3	8	1	1	7
4	16	8	4	28	30	5	1	10	1	3	4	11	4	0	2
0	11	8	2	16	41	4	4	7	1	0	2	6	5	0	3
1	3	4	16	12	3	1	9	2	0	2	4	6	2	0	0
3	3	7	14	7	6	3	5	1	2	1	1	1	2	1	4
2	9	7	16	4	7	2	7	1	2	6	4	7	7	0	1
17	1	2	10	0	6	2	3	7							
11	3	4	18	0	6	1	4	6							
10	0	5	7	2	9	1	8	8							

INDUSTRY 23	POPULATION	6472 6702 6634	STAYERS	4590 4674 4690	EXITS	1362 1314 1428

0	1	1	2	3	2	2	3	9	2	0	5	7	4	8	0
1	1	1	2	2	1	2	2	7	2	2	5	2	6	7	2
2	2	0	3	2	3	1	0	7	4	0	1	1	0	5	1
6	2	3	7	3	31	0	0	2	3	2	4	14	9	3	8
11	0	1	7	8	57	0	2	1	2	2	6	8	16	2	6
5	2	3	3	2	27	0	1	0	1	4	5	4	3	0	5
0	14	1	1	6	26	7	2	7	5	2	8	3	4	0	15
2	24	3	5	16	16	3	0	6	2	5	10	6	6	0	21
1	17	3	1	12	16	6	1	8	0	1	3	10	14	0	12
5	4	9	33	5	11	3	11	4	5	21	23	13	10	8	4
4	16	11	63	10	15	9	16	6	4	47	26	19	13	5	10
4	28	10	37	14	19	10	17	8	2	13	19	11	6	3	6
38	2	6	9	0	14	17	5	13							
47	2	2	25	0	14	15	13	23							
41	3	2	17	1	14	6	10	13							

INDUSTRY 24	POPULATION	4117 4204 4271	STAYERS	3422 3448 3315	EXITS	487 460 496

0	2	0	0	3	1	2	0	3	0	0	3	0	0	1	0
1	3	0	3	3	1	3	1	3	1	0	4	0	0	0	0
3	1	0	90	4	0	1	0	3	1	0	4	1	0	0	0
0	0	1	2	1	0	1	0	9	1	2	17	19	14	2	13
0	1	0	1	2	1	4	0	2	3	6	25	27	15	2	4
0	1	4	1	3	0	0	0	8	5	4	7	30	6	4	22
5	6	3	0	3	4	8	7	10	0	0	3	8	1	0	3
2	9	5	1	9	3	9	8	22	0	2	2	5	4	0	2
4	40	12	0	49	1	9	10	24	0	1	0	6	5	0	3
3	0	3	10	2	2	2	5	0	1	0	0	1	0	1	0
1	1	4	23	3	2	0	7	2	0	1	2	2	1	1	0
2	0	5	19	4	1	0	10	1	0	2	8	0	1	0	2
8	0	1	1	1	3	0	2	4							
8	0	0	6	1	9	2	7	14							
5	0	3	8	1	8	2	5	6							

INDUSTRY 25 POPULATION 1208 1434 1416 STAYERS 877 929 923 EXITS 159 214 249

2	1	0	0	1	2	0	0	4	0	1	0	1	4	0	0
5	3	0	6	0	1	0	1	3	0	0	1	1	0	2	1
5	1	0	6	3	3	2	0	2	2	0	0	0	2	1	1
1	1	1	3	0	2	1	7	0	1	8	11	15	5	2	9
0	1	0	5	1	2	0	13	0	2	4	5	108	8	1	16
0	1	1	1	0	3	0	4	0	0	6	4	87	6	0	10
2	9	10	0	1	3	4	7	9	0	1	2	3	1	1	1
3	3	4	2	4	2	2	4	14	1	2	3	6	2	0	0
4	7	0	0	2	3	7	9	8	0	2	0	4	3	0	0
3	1	2	5	1	1	0	4	0	1	0	0	2	0	0	2
0	1	2	5	0	2	0	6	0	1	0	1	0	1	1	1
1	2	1	5	2	0	1	5	0	0	1	2	2	2	1	0
5	0	0	3	0	2	1	1	1							
3	1	0	4	0	9	0	4	7							
2	1	1	2	0	3	2	3	5							

INDUSTRY 26 POPULATION 2884 3472 3103 STAYERS 2334 2440 2236 EXITS 239 385 433

0	2	0	135	4	1	2	0	1	0	0	0	0	1	1	0
1	4	0	436	6	1	0	1	2	5	0	1	0	0	0	0
2	4	0	253	7	0	1	0	2	1	0	3	0	0	0	0
1	2	1	1	4	0	1	3	0	0	3	4	2	1	3	10
0	3	0	2	9	1	1	23	2	0	1	0	0	2	3	1
1	4	3	2	8	2	0	2	2	0	16	1	3	3	2	1
3	3	1	0	32	2	3	7	11	0	1	6	2	4	1	2
2	1	0	1	26	1	11	9	10	2	1	5	9	1	0	2
0	1	1	0	4	0	5	4	10	1	2	2	4	4	0	1
1	1	1	5	1	0	0	7	2	1	3	2	4	1	0	0
3	1	3	21	2	1	1	6	0	2	0	3	0	2	0	4
7	1	3	12	2	0	0	6	1	2	2	4	0	0	0	3
6	0	0	4	0	0	2	5	4							
3	0	0	2	0	1	2	2	2							
3	0	1	7	0	1	4	8	5							

INDUSTRY 27 POPULATION 880 1083 1058 STAYERS 602 741 795 EXITS 161 197 138

1	1	0	1	1	2	0	2	5	1	0	0	0	0	1	0
1	2	0	2	0	5	0	0	2	1	0	2	2	0	0	0
1	1	1	2	0	1	1	1	0	0	0	3	0	1	1	0
0	0	2	5	0	0	1	3	6	3	0	8	6	4	1	8
2	1	0	4	0	0	1	1	5	3	0	11	18	4	3	4
0	0	1	4	0	1	1	5	2	1	0	4	8	6	1	12
1	5	0	0	2	7	1	2	5	0	1	1	2	0	0	0
0	3	2	1	2	5	0	2	5	0	1	1	3	5	0	3
3	4	1	0	0	3	0	5	11	0	1	0	2	2	0	1
0	0	0	5	0	2	1	1	0	1	0	2	0	0	1	0
1	0	2	4	2	0	0	3	0	0	2	1	0	0	1	0
1	0	2	5	0	0	1	4	1	2	1	3	0	1	0	0
6	0	0	0	1	4	0	1	3							
1	0	0	5	0	5	3	2	6							
0	0	0	4	0	4	0	3	1							

INDUSTRY	28	POPULATION	5704 5817 5882	STAYERS	3256 3453 3348	EXITS	1284 1191 1449

4	4	1	2	5	1	7	4	11	4	2	6	5	3	5	1
6	7	1	7	6	12	7	2	14	4	1	7	2	4	1	2
4	8	1	15	6	3	9	1	11	7	1	2	7	2	4	1
2	3	12	35	6	6	7	16	9	4	159	0	60	57	10	80
2	2	8	29	11	13	4	22	18	5	9	0	112	69	13	107
1	5	7	36	7	7	10	23	19	4	8	0	60	43	11	60
11	34	19	2	12	25	44	27	154	0	3	8	23	4	1	7
13	40	13	1	20	30	39	38	154	4	8	17	22	10	0	8
18	86	19	1	13	21	53	37	138	3	5	4	19	10	2	4
5	4	10	66	6	6	3	15	4	4	4	8	6	6	1	2
3	3	16	49	11	4	4	23	0	10	3	6	4	6	2	5
10	1	13	55	5	6	5	27	1	4	9	8	7	4	3	2
20	3	1	11	0	34	8	11	21							
11	2	3	25	0	21	2	11	25							
15	1	5	13	1	36	5	13	20							

INDUSTRY	29	POPULATION	5596 5948 5961	STAYERS	3477 3537 3661	EXITS	999 1202 1209

2	3	0	5	2	5	5	1	18	5	6	8	5	1	8	2
5	7	0	5	8	13	4	0	18	4	0	10	2	3	5	2
10	6	2	8	16	3	5	5	15	6	1	5	5	6	9	3
8	1	6	19	6	9	11	39	102	4	4	95	0	110	39	57
9	2	4	20	9	14	8	40	86	3	9	107	0	132	32	56
6	3	5	18	4	5	8	7	27	5	14	73	0	83	14	156
9	61	19	3	16	36	20	22	46	2	3	5	11	5	2	7
15	49	16	1	19	31	19	20	39	0	5	10	22	8	2	3
14	31	18	0	13	36	8	11	42	0	2	6	13	10	1	6
8	1	22	69	6	3	4	20	5	5	4	5	5	2	1	4
9	6	27	70	15	4	7	33	5	5	6	6	8	6	4	2
4	1	23	111	10	6	3	33	1	4	9	8	2	8	3	6
10	0	0	12	1	42	5	8	25							
13	1	4	15	0	35	3	15	34							
16	1	4	16	2	41	3	10	22							

INDUSTRY	30	POPULATION	5844 5785 6233	STAYERS	3602 3860 3857	EXITS	1245 1107 1256

1	2	0	7	7	4	1	2	8	1	0	8	10	0	6	2
9	2	0	3	6	5	5	5	7	3	3	5	4	2	1	1
5	4	0	5	9	3	2	5	7	7	2	6	6	3	0	2
7	1	2	6	4	7	8	11	8	1	10	63	113	0	26	112
0	3	3	13	2	4	7	7	24	0	2	47	101	0	23	27
1	2	2	7	7	8	6	25	92	5	6	44	94	0	28	50
13	98	13	1	55	10	20	8	44	0	1	10	11	7	0	7
19	31	13	1	16	17	25	16	56	6	2	15	15	7	0	6
20	30	9	1	67	13	24	18	45	3	9	6	18	17	3	6
0	1	9	84	7	6	4	19	0	2	6	9	5	9	0	7
2	2	7	96	6	8	3	23	0	1	2	7	10	5	2	3
8	5	15	146	6	9	6	24	3	7	5	14	9	11	7	5
32	0	1	14	0	8	12	13	13							
13	1	0	12	0	11	5	9	21							
24	1	2	16	1	23	13	11	17							

INDUSTRY 31 POPULATION 2247 2540 2886 STAYERS 1644 1811 2126 EXITS 415 495 526

0	0	0	1	2	1	0	0	4	1	0	1	0	1	1	0
1	1	0	3	0	0	1	0	2	0	2	0	0	0	0	0
0	0	0	1	1	2	1	1	5	0	1	1	1	0	0	1
0	0	0	0	1	2	1	0	0	2	0	2	11	18	0	11
0	1	0	2	0	3	3	3	0	0	1	10	16	22	0	1
0	0	0	3	2	1	1	0	1	1	0	5	34	21	0	5
3	24	1	0	5	10	6	3	8	12	2	5	3	1	0	0
3	21	2	3	0	7	5	5	12	28	1	4	3	2	1	1
6	13	3	2	3	6	4	4	10	5	1	2	7	2	0	1
0	1	2	7	1	3	1	1	0	0	0	2	0	1	1	0
3	1	2	7	3	2	0	7	1	1	1	3	4	1	2	2
2	0	3	15	1	5	1	11	1	0	0	2	1	6	1	0
6	0	0	2	0	3	6	1	7							
6	0	0	4	0	9	0	1	4							
6	0	4	4	0	5	1	1	6							

INDUSTRY 32 POPULATION 7524 7917 7696 STAYERS 5866 5928 5778 EXITS 995 1215 1265

2	3	2	3	4	3	3	2	7	2	1	8	2	1	24	3
5	1	0	5	4	1	12	5	10	7	0	9	0	3	20	0
3	5	0	7	2	5	2	2	6	1	0	4	2	3	10	1
6	3	4	4	2	5	5	10	10	2	4	29	28	59	106	0
1	5	4	6	4	9	6	12	6	4	6	35	47	61	15	0
2	1	5	11	2	2	5	1	47	1	3	51	35	19	0	0
1	20	18	2	3	10	16	12	24	1	4	3	15	3	1	4
5	25	12	0	12	14	10	18	28	3	2	11	19	15	0	10
8	25	39	2	15	10	18	12	17	0	2	6	14	11	3	7
6	3	14	21	7	6	1	39	3	1	5	6	3	1	3	1
3	0	57	31	9	9	4	44	0	4	8	10	4	5	1	3
4	1	31	30	6	3	7	39	1	3	2	6	1	5	2	4
6	0	4	15	0	11	6	8	9							
12	2	1	19	0	13	9	13	26							
11	0	5	16	0	29	2	5	13							

INDUSTRY 33 POPULATION 2968 3128 2698 STAYERS 2055 1966 1838 EXITS 378 626 536

0	0	4	5	2	1	2	1	5	1	1	0	1	3	0	1
2	4	5	4	4	0	1	9	2	2	0	3	1	2	0	0
2	6	2	4	2	3	2	4	1	1	0	3	1	0	1	1
0	0	1	6	3	0	2	6	4	2	1	26	19	56	7	9
1	1	2	5	6	2	2	5	3	1	1	10	20	15	9	9
0	4	3	3	2	4	0	7	3	5	1	17	9	16	9	15
0	5	9	1	1	4	20	17	30	0	8	179	5	5	0	0
0	11	2	0	1	3	6	17	43	2	4	199	6	2	1	1
0	4	6	1	2	8	20	15	22	2	9	5	6	8	0	0
3	1	1	4	2	6	1	8	0	2	6	0	1	1	2	0
4	0	2	5	1	4	1	11	0	1	4	14	1	6	2	4
1	1	2	8	2	1	4	8	1	6	5	1	2	6	0	1
2	0	1	5	0	13	8	4	11							
4	1	1	6	0	10	11	7	7							
4	0	3	4	0	7	1	6	11							

INDUSTRY 34 POPULATION 8921 9710 10312 STAYERS 6245 6630 6876 EXITS 1755 2054 2334

1	1	0	3	4	3	3	5	11	5	3	18	4	9	14	2
2	3	0	5	5	5	7	3	17	4	1	9	5	7	5	1
10	4	0	7	5	8	7	5	23	3	4	10	10	12	9	5
10	1	3	15	2	9	13	8	14	2	7	35	45	30	33	24
7	1	3	23	2	18	12	38	4	2	4	26	52	70	32	29
7	3	3	46	11	16	18	7	1	2	7	27	38	23	31	53
5	0	12	2	17	54	14	11	34	3	0	11	10	5	1	39
5	0	9	2	18	66	4	3	37	4	2	15	19	5	2	21
7	0	10	1	44	86	15	15	34	7	1	4	19	12	0	18
7	4	18	97	13	13	6	17	3	10	4	12	11	10	1	1
11	3	15	105	15	14	6	16	2	5	6	8	14	11	2	8
9	4	13	70	10	19	8	40	11	15	17	14	16	9	9	8
36	4	6	20	0	27	19	10	17							
30	0	4	34	1	26	9	12	55							
22	2	11	35	0	26	11	21	14							

INDUSTRY 35 POPULATION 4574 5055 4254 STAYERS 2882 2705 2553 EXITS 883 1205 984

3	9	1	1	33	5	2	3	9	3	2	5	1	4	5	1
10	12	0	7	269	8	6	2	15	2	0	4	3	4	3	0
12	8	1	4	28	8	6	8	9	3	0	3	1	5	5	0
2	3	7	16	4	2	1	5	7	2	4	25	15	11	5	16
1	5	7	15	6	12	4	12	8	6	2	22	16	16	4	14
5	1	7	7	2	4	4	2	5	2	3	14	12	2	4	15
7	17	0	2	11	27	50	85	107	2	4	14	38	8	3	1
3	16	0	2	18	16	44	106	101	1	19	12	34	8	2	6
3	8	0	6	17	6	33	139	58	3	2	4	33	9	1	0
6	4	16	71	3	1	4	18	1	2	9	5	7	5	0	2
5	1	18	61	12	9	4	18	2	5	7	9	7	5	4	2
4	1	16	45	3	3	0	23	5	2	4	9	4	7	2	6
12	0	1	11	0	9	2	12	20							
10	0	1	26	1	14	12	14	15							
10	0	0	13	0	16	3	15	14							

INDUSTRY 36 POPULATION 1346 1072 1374 STAYERS 780 684 744 EXITS 428 261 335

0	1	0	2	31	0	0	0	4	0	0	0	0	1	0	0
0	0	0	1	21	0	0	0	0	1	0	0	0	0	0	0
0	1	0	2	5	0	0	1	0	0	0	0	0	0	4	0
1	0	0	0	1	0	1	1	0	1	0	0	3	1	0	0
2	1	0	0	1	13	2	0	0	0	0	1	1	5	1	0
1	2	0	1	3	2	5	0	0	1	1	0	0	4	0	2
0	1	3	0	2	0	3	2	4	0	0	4	5	5	0	1
0	2	1	0	3	0	1	7	0	0	3	0	4	1	1	2
0	1	3	0	2	3	1	3	1	0	0	1	1	1	0	2
1	31	1	0	0	4	0	7	0	0	0	1	1	0	0	0
1	20	0	2	1	0	0	6	0	1	2	1	6	0	0	0
4	197	1	4	0	3	1	7	1	0	2	1	1	1	0	2
6	0	0	1	0	1	1	4	1							
5	0	0	3	0	0	1	0	3							
4	0	0	2	1	3	2	2	2							

INDUSTRY 37	POPULATION	5302 5155 5241	STAYERS	3300 3269 3465	EXITS	1247 1103 1161

1	3	1	3	5	5	5	7	28	6	2	6	2	20	32	2
3	5	0	2	2	0	5	3	25	6	3	9	1	13	4	0
7	0	1	11	5	2	5	5	22	8	0	3	2	55	5	2
5	0	0	5	7	17	9	41	0	11	2	13	28	12	6	15
3	2	3	8	8	12	8	9	3	34	3	5	30	97	4	11
4	2	3	5	7	12	14	8	3	2	4	14	13	10	1	6
3	46	20	2	0	18	8	8	21	5	3	9	13	4	0	8
4	18	10	1	0	75	13	12	33	5	1	2	12	9	0	14
3	19	14	6	0	9	9	5	17	0	2	5	8	4	4	12
2	1	38	98	4	8	3	9	2	6	9	11	9	6	1	4
4	6	29	42	7	9	4	18	2	2	5	14	11	8	2	5
7	7	24	47	9	14	2	11	7	4	11	5	8	2	0	1
28	1	4	10	1	9	7	4	13							
26	0	2	8	1	13	7	5	23							
23	1	3	15	2	13	13	11	17							

INDUSTRY 38	POPULATION	5243 5598 5731	STAYERS	3139 3229 3321	EXITS	1197 1279 1422

3	1	1	3	5	3	4	1	9	2	0	14	28	12	16	11
6	3	0	4	2	0	5	1	18	2	6	15	12	14	13	4
3	2	1	2	3	5	3	3	14	6	1	8	14	14	19	6
20	2	6	35	10	25	22	2	4	0	3	36	32	25	15	33
19	3	8	43	0	42	25	2	0	3	6	33	51	25	9	21
27	2	10	19	1	39	23	2	0	2	1	24	44	19	10	28
4	72	9	4	38	0	13	8	50	3	3	11	10	5	0	5
8	104	45	4	23	0	16	5	25	1	3	10	9	12	1	6
2	90	16	1	39	0	16	7	29	1	3	4	15	10	4	5
5	2	13	56	15	8	2	16	2	2	31	8	9	3	9	4
3	8	23	105	10	17	4	17	5	8	52	8	12	6	13	8
4	2	18	91	7	18	9	20	6	4	32	6	12	11	12	9
31	3	6	22	0	10	12	8	12							
33	2	9	22	0	17	10	7	24							
42	2	9	27	1	16	5	10	18							

INDUSTRY 39	POPULATION	10111 10994 9649	STAYERS	4746 4599 4196	EXITS	2553 3211 3089

27	83	6	33	36	9	8	5	22	7	0	7	6	10	12	1
30	96	32	27	46	12	13	26	26	13	0	11	8	9	5	2
30	65	24	15	47	11	9	21	21	6	0	2	3	5	3	2
1	32	41	31	21	6	5	6	12	13	3	67	18	23	8	25
3	35	38	42	25	10	4	10	8	16	5	44	19	23	7	25
4	30	28	40	21	4	11	3	6	10	4	42	15	13	3	17
30	26	78	1	14	10	0	472	698	0	13	31	52	33	4	9
24	11	49	5	15	17	0	663	831	2	18	36	82	37	3	5
12	10	31	0	20	9	0	355	605	1	14	17	46	28	14	4
25	11	23	106	8	9	12	50	7	10	9	10	65	26	6	11
40	7	17	82	15	10	13	53	7	12	9	11	65	38	5	16
58	8	9	85	21	4	13	41	3	12	12	10	72	33	2	15
44	2	6	42	2	46	43	73	111							
39	5	6	45	3	58	39	58	63							
30	3	1	33	0	37	32	82	67							

INDUSTRY 40	POPULATION	5579 6749 7126	STAYERS	2308 2835 3004	EXITS	1456 2011 2305

12	51	7	19	70	3	5	10	5	3	0	4	5	2	1	0
22	75	12	50	64	2	8	12	19	2	0	4	1	5	2	1
20	57	26	29	59	4	7	14	9	5	0	3	7	4	4	2
3	18	9	15	13	1	4	14	8	9	1	31	20	12	6	12
2	41	5	10	12	4	4	8	4	14	3	32	18	15	6	8
0	34	1	5	19	5	2	6	3	4	3	39	13	16	2	10
16	2	79	3	11	3	479	0	312	1	23	12	54	31	5	2
17	11	25	2	5	4	458	0	298	2	27	25	70	40	5	6
10	8	39	3	9	6	396	0	286	2	13	15	64	37	3	5
71	4	11	43	3	4	6	44	0	4	3	6	5	6	1	8
75	8	13	53	4	6	3	35	1	4	6	3	6	6	2	4
94	8	15	47	11	4	3	41	1	3	11	23	5	10	4	5
16	3	4	28	1	25	17	42	54							
18	1	1	38	2	56	20	48	30							
19	1	3	38	4	31	19	57	52							

INDUSTRY 41	POPULATION	13677 14822 14930	STAYERS	7842 8133 8086	EXITS	2952 3630 4072

10	42	4	24	35	4	18	6	14	7	0	7	3	15	11	4
20	73	5	23	47	15	10	7	31	4	4	10	5	14	2	2
30	43	8	26	28	12	8	12	19	8	3	7	5	10	10	3
5	12	28	28	20	5	10	18	11	26	6	144	55	51	10	26
7	25	28	25	21	9	10	13	9	12	5	170	36	51	16	24
5	24	26	26	26	11	10	15	9	10	4	93	37	51	12	41
33	27	184	1	28	32	650	334	0	1	8	28	70	31	0	10
32	30	88	4	30	30	649	411	0	2	15	39	75	28	4	11
31	19	54	2	21	20	670	283	0	0	16	18	57	31	5	3
24	11	21	192	19	16	11	51	5	62	26	2	27	26	7	7
48	6	23	183	13	13	10	68	4	75	22	11	25	31	9	21
49	10	23	125	22	15	12	63	4	67	21	5	26	34	9	12
26	2	5	37	0	52	36	55	67							
31	2	4	45	4	98	30	41	61							
33	0	3	48	1	86	40	109	93							

INDUSTRY 42	POPULATION	945 1043 1053	STAYERS	592 507 535	EXITS	256 422 421

0	1	1	1	2	0	1	1	0	0	0	0	0	0	0	0
0	0	0	2	0	0	0	2	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	1	9	0
0	0	1	1	0	0	0	0	0	0	0	3	1	0	5	1
0	0	0	0	1	0	1	0	1	1	0	0	1	0	4	0
1	1	0	0	0	3	2	0	1	0	1	1	1	4	0	0
0	3	0	0	0	2	2	0	3	0	1	1	3	33	0	3
0	1	0	0	1	0	2	3	1	0	1	0	1	4	1	0
0	4	0	5	0	2	1	3	0	4	2	2	1	1	1	0
0	1	0	5	0	5	0	3	2	1	0	2	7	2	0	2
2	8	1	3	1	2	2	2	1	0	2	3	0	1	0	1
5	0	1	1	0	12	17	0	2							
4	1	0	2	0	2	5	1	1							
8	0	1	4	0	4	17	4	3							

INDUSTRY 43 POPULATION 2043 2810 3069 STAYERS 1261 1792 1905 EXITS 495 611 702

1	14	1	4	6	0	1	5	1	2	0	1	0	1	2	0
2	14	5	4	8	2	1	12	2	1	0	0	0	2	0	0
4	28	12	5	3	2	1	7	4	3	0	2	0	0	0	0
0	4	0	2	12	2	1	1	0	2	0	3	4	1	3	3
1	7	0	1	6	0	2	0	0	1	1	3	2	2	0	1
0	14	0	1	13	2	1	0	2	3	0	0	5	3	1	4
7	4	7	2	3	2	6	26	6	2	0	24	6	8	8	6
9	4	4	0	2	2	9	17	9	3	0	104	15	13	17	4
10	3	10	1	2	0	15	21	12	0	0	88	12	7	5	15
3	11	0	17	4	1	0	2	0	0	3	3	3	1	1	3
1	2	6	7	2	1	0	8	2	1	11	4	4	2	1	4
6	1	7	12	3	2	2	10	2	2	5	1	5	6	0	8
7	0	1	8	1	3	6	3	12							
6	1	0	20	0	12	8	7	5							
5	1	0	13	1	5	7	25	12							

INDUSTRY 44 POPULATION 10850 13079 12909 STAYERS 8589 10039 8888 EXITS 1099 1498 3056

6	18	5	9	38	3	6	8	12	3	0	2	1	4	1	0
6	23	4	19	10	3	4	8	16	6	1	4	2	4	3	2
16	26	9	14	18	7	7	9	12	6	1	6	2	5	1	0
1	20	6	3	8	4	6	10	6	3	1	12	11	13	3	19
2	18	4	9	14	8	9	7	2	8	0	7	11	11	5	13
3	13	4	9	14	4	6	3	3	6	0	14	9	8	6	15
173	10	12	1	15	8	28	29	24	9	195	0	40	20	9	103
12	19	10	6	11	5	30	29	35	11	100	0	48	288	3	274
5	13	8	3	9	6	32	32	51	3	44	0	48	49	5	17
18	6	12	17	7	8	2	25	0	4	4	9	9	8	2	3
22	3	17	20	9	15	4	26	2	3	6	9	7	14	3	7
25	9	14	28	11	8	4	37	6	6	8	14	15	22	4	11
15	1	3	30	1	17	11	21	11							
29	4	2	136	1	27	16	20	16							
20	1	5	41	4	33	15	28	15							

INDUSTRY 45 POPULATION 6349 6832 7316 STAYERS 3863 4207 4159 EXITS 1328 1541 1873

9	46	6	11	44	8	12	6	17	3	0	5	1	4	4	0
18	48	6	13	32	7	13	6	21	8	1	7	1	4	3	0
19	51	2	12	31	9	8	3	22	4	0	9	0	4	2	0
1	15	4	11	5	9	5	7	5	6	4	24	11	18	6	20
1	12	10	9	11	3	7	10	3	6	2	26	7	16	6	26
5	22	7	8	9	7	4	3	6	6	1	9	11	7	3	15
4	17	28	3	12	7	64	81	70	4	14	36	0	45	16	9
8	11	29	4	14	5	56	51	59	1	10	35	0	48	13	12
6	16	41	2	9	8	53	77	52	2	12	20	0	64	117	7
8	14	17	74	9	18	3	69	3	6	18	6	7	12	1	10
15	17	35	54	13	13	5	61	3	3	11	8	8	5	3	3
13	16	45	71	14	7	8	72	2	13	15	7	6	8	4	5
25	0	4	19	0	31	15	32	20							
21	0	5	19	0	24	15	24	20							
31	3	9	32	1	34	11	37	35							

INDUSTRY 46	POPULATION	5187 5295 5510	STAYERS	2835 2726 3140	EXITS	1264 1187 1487

2	21	8	7	36	2	6	7	10	0	1	4	2	1	2	2
2	30	9	8	39	2	8	6	435	1	1	1	0	1	0	1
7	17	12	10	16	6	7	8	5	0	1	5	0	3	1	1
2	13	5	5	5	0	4	3	0	4	3	9	3	2	2	10
1	5	4	5	8	7	6	3	0	2	2	4	6	6	3	1
2	10	3	2	5	2	10	1	4	5	1	9	6	6	2	6
2	8	10	3	7	6	27	41	25	28	14	263	43	0	5	3
2	9	5	6	6	3	29	40	25	7	18	16	61	0	1	7
2	7	6	2	3	4	27	30	35	0	14	17	43	0	1	6
33	6	9	22	8	5	5	38	6	7	5	13	9	7	1	6
133	6	16	25	14	9	5	47	2	3	8	4	12	5	2	6
40	4	18	28	12	8	5	41	1	4	4	8	9	14	3	4
19	1	4	18	1	16	64	98	21							
9	1	4	17	3	35	62	101	11							
13	2	4	27	1	28	45	171	19							

INDUSTRY 47	POPULATION	968 1004 1140	STAYERS	543 608 739	EXITS	180 251 231

1	0	1	0	0	3	0	2	2	1	0	0	0	0	1	0
2	0	0	0	3	0	0	3	5	0	0	0	0	1	3	0
6	1	0	2	4	4	1	1	6	1	0	0	0	0	0	0
0	1	0	1	0	1	1	2	0	3	0	1	3	4	0	0
0	3	0	1	0	0	1	0	1	2	0	2	0	0	0	0
0	1	1	0	0	1	0	0	2	2	0	2	0	1	0	0
2	0	2	1	3	0	3	5	9	0	4	4	21	6	0	0
1	1	0	0	1	1	5	2	6	1	3	6	22	3	0	1
0	0	2	1	1	0	9	4	7	1	14	3	14	3	0	1
0	86	7	27	1	1	5	3	2	1	1	3	2	3	0	1
1	6	8	6	3	2	2	8	0	0	0	4	0	0	0	0
1	4	5	10	5	2	3	4	1	1	3	3	2	3	0	0
2	0	0	4	0	3	2	2	1							
2	0	0	1	0	4	7	8	3							
3	0	0	4	0	4	6	5	5							

INDUSTRY 48	POPULATION	5924 6483 6884	STAYERS	4111 4292 4682	EXITS	1327 1657 1723

0	2	1	3	1	1	0	2	4	3	2	2	1	3	2	2
0	3	1	4	3	3	4	1	4	0	0	0	2	3	2	1
3	3	2	3	2	2	3	2	7	2	1	2	2	1	0	0
5	1	0	2	2	3	6	2	1	1	1	6	1	5	4	11
1	3	1	6	1	5	9	4	2	2	2	4	3	6	2	2
3	1	2	2	5	2	11	0	0	1	2	3	0	8	5	6
1	21	4	1	7	3	5	2	8	5	2	41	9	10	0	0
0	31	5	2	2	8	3	5	6	8	3	66	13	6	1	0
1	10	2	1	10	4	9	6	9	4	5	32	5	1	1	0
11	2	3	22	10	19	6	7	6	5	7	22	17	6	2	4
14	2	9	24	9	15	7	13	4	7	11	24	22	2	5	6
2	5	7	23	8	15	11	17	4	8	6	34	12	9	7	6
27	0	3	21	0	16	19	39	13							
31	1	6	18	0	12	18	13	18							
32	0	5	20	0	18	14	18	12							

INDUSTRY 49	POPULATION	4526 4399 4931	STAYERS	2831 3057 3280	EXITS	1039 930 1156

2	7	1	5	2	1	3	3	6	0	1	0	0	1	0	0
2	11	1	8	7	1	1	1	3	1	0	0	1	0	0	0
2	10	1	8	3	2	0	1	3	1	1	1	2	4	2	1
0	2	1	1	6	1	3	1	1	1	0	5	3	3	1	8
0	4	0	3	2	1	0	0	0	0	1	3	1	4	2	2
1	11	4	2	5	0	5	4	2	19	0	2	0	2	2	2
3	6	2	0	3	1	19	51	19	0	2	23	14	159	0	11
0	4	7	3	2	3	13	27	22	3	5	6	20	17	2	2
2	6	5	2	3	2	18	35	27	2	2	13	9	18	2	3
0	2	2	10	3	5	2	10	0	2	4	4	6	3	0	2
0	9	2	8	3	2	3	7	0	3	2	3	6	2	3	2
0	1	3	9	4	4	3	11	1	1	3	6	7	7	4	3
10	2	1	7	0	12	9	170	8							
13	0	1	3	0	8	14	108	14							
9	0	2	5	1	10	6	132	11							

INDUSTRY 50	POPULATION	1971 1761 1645	STAYERS	776 645 737	EXITS	504 461 406

2	3	1	2	11	7	15	0	9	2	1	4	2	0	0	0
2	3	1	1	14	3	3	2	5	0	0	1	0	0	1	0
4	4	0	0	3	2	3	0	17	1	0	2	0	1	1	1
2	1	0	3	20	8	4	2	2	0	0	0	8	6	0	4
1	0	2	0	4	5	2	1	2	0	0	1	3	3	2	0
1	3	0	2	8	4	4	3	2	2	0	2	0	4	0	3
3	3	3	22	3	3	8	6	13	5	8	6	15	26	104	7
1	5	3	98	1	3	13	5	10	4	11	4	14	5	150	3
0	3	3	10	6	4	6	4	15	2	3	0	21	4	13	0
0	0	63	54	4	6	23	19	1	3	102	7	1	2	3	0
0	0	32	59	3	8	6	44	1	4	50	9	3	5	0	3
13	0	18	92	21	3	7	29	3	9	88	4	1	7	1	0
13	0	1	7	1	10	4	9	4							
14	0	0	4	0	4	2	7	5							
8	0	1	5	1	8	4	3	5							

INDUSTRY 51	POPULATION	6381 6213 6778	STAYERS	3204 3225 3603	EXITS	1421 1448 1696

24	10	13	7	6	74	17	122	75	16	2	11	6	6	12	4
42	9	9	7	8	65	15	36	120	15	3	10	2	9	18	6
65	3	5	4	12	35	17	43	84	11	2	29	4	12	9	4
16	7	5	12	6	11	15	5	0	4	3	14	40	23	2	22
8	4	5	9	3	5	6	5	3	2	3	18	17	14	7	30
10	8	3	10	3	3	16	4	2	1	2	14	22	16	5	28
5	25	11	4	29	19	28	15	27	3	4	23	41	23	6	11
4	12	12	2	33	23	20	16	19	1	6	17	48	19	8	9
2	11	10	2	37	11	15	13	26	1	10	6	34	14	8	14
5	44	0	236	100	20	32	172	24	36	35	21	20	7	3	6
5	85	0	159	73	22	28	147	31	11	38	12	13	11	5	8
5	22	0	139	58	21	50	133	9	16	26	20	18	9	4	10
31	3	6	15	3	24	13	18	18							
25	0	9	41	0	12	10	12	21							
18	2	10	33	2	24	13	18	119							

INDUSTRY 52	POPULATION	11792 12315 11776	STAYERS	6139 5933 6032	EXITS	2597 3113 3188

37	47	3	10	44	7	13	5	105	16	2	17	6	16	12	4
22	66	3	7	37	10	17	16	86	10	5	12	6	9	14	3
38	25	3	13	30	8	13	13	54	16	2	9	9	6	7	1
13	87	104	30	20	25	66	12	7	28	8	61	81	107	13	26
14	76	48	27	9	17	27	21	11	17	5	53	82	107	11	37
7	36	56	29	12	14	38	8	13	6	4	47	55	103	17	32
17	61	73	6	44	63	128	66	192	8	9	25	82	25	8	18
12	152	85	7	72	66	101	67	203	10	26	33	90	36	8	25
10	44	37	3	34	70	82	48	129	6	11	13	76	25	6	17
23	73	171	0	25	32	32	156	9	145	97	38	32	19	6	18
8	97	362	0	24	22	38	143	20	102	87	31	32	19	13	19
25	67	177	0	28	21	40	130	19	73	95	39	40	26	15	14
92	3	10	33	0	80	22	35	48							
99	1	3	48	2	118	30	34	39							
89	2	7	46	5	163	20	32	48							

INDUSTRY 53	POPULATION	8716 9562 9117	STAYERS	5181 5325 5141	EXITS	2083 2821 2388

3	10	0	11	10	35	52	10	172	18	1	7	6	15	10	6
6	11	0	7	4	32	14	14	86	8	2	7	5	12	8	0
7	2	0	6	7	27	14	8	51	8	0	5	3	11	11	6
10	6	4	7	8	9	19	4	2	5	0	13	14	12	3	9
12	7	5	22	8	13	16	10	3	7	1	9	10	15	7	7
6	2	8	10	12	11	17	4	3	2	0	12	9	5	0	12
5	23	13	3	15	22	18	11	41	2	4	13	25	13	4	25
3	38	4	4	19	14	12	9	30	7	5	9	26	20	5	30
4	26	8	2	19	19	24	8	29	3	1	10	18	16	4	31
4	7	105	39	0	47	112	45	30	16	32	37	17	12	6	10
16	27	92	54	0	41	119	37	18	17	26	52	25	18	10	13
11	8	219	34	0	40	317	44	37	13	40	42	19	16	15	9
22	4	8	87	3	13	24	9	35							
30	5	19	100	2	19	21	19	33							
19	2	9	81	1	26	14	30	41							

INDUSTRY 54	POPULATION	8839 10934 11737	STAYERS	5953 7647 7576	EXITS	1956 2285 3144

2	2	0	5	2	3	8	0	14	7	0	4	1	7	4	2
1	3	0	6	3	6	5	3	16	4	3	3	2	4	2	0
1	1	0	3	4	5	6	1	9	4	2	3	2	1	2	2
9	2	4	5	5	10	11	5	1	0	1	7	7	12	1	5
8	1	2	5	5	9	19	1	2	0	1	6	6	14	6	3
9	3	5	8	5	6	21	2	3	0	2	9	6	9	4	5
1	26	2	2	7	15	7	7	22	3	0	20	11	8	0	22
1	28	6	8	17	17	4	6	12	10	6	29	13	8	4	30
4	25	2	3	18	12	5	4	14	15	5	19	11	13	2	15
10	6	26	35	35	0	94	13	64	15	28	46	31	12	6	8
6	5	28	48	20	0	86	28	41	18	34	59	30	15	21	8
9	12	31	45	28	0	60	26	46	14	44	60	48	25	21	13
37	14	9	46	2	22	35	42	55							
40	7	12	47	0	27	37	20	17							
52	3	7	60	0	23	33	21	26							

INDUSTRY 55	POPULATION	5531 5915 5966	STAYERS	2881 3033 3170	EXITS	1503 1677 1764

2	15	9	5	3	5	12	4	18	3	0	2	1	2	2	5
1	11	9	9	5	6	13	10	44	4	1	1	6	3	2	4
10	6	11	5	3	2	10	7	20	2	1	2	4	2	3	1
12	3	1	5	6	7	10	1	0	3	0	7	2	4	1	5
11	3	2	6	3	3	8	2	0	2	0	5	5	9	3	5
4	7	4	4	3	4	11	1	1	3	0	4	7	6	1	8
1	21	9	0	11	12	16	8	16	2	5	5	8	9	3	18
1	9	2	2	8	6	20	8	23	0	6	1	11	12	0	29
1	12	8	2	7	9	13	5	9	2	1	0	7	7	1	11
3	6	22	44	138	150	0	28	134	50	39	37	14	6	10	7
4	17	46	49	140	96	0	27	164	19	75	35	15	11	9	7
7	17	33	48	105	67	0	21	166	23	66	39	17	9	11	6
9	9	12	68	1	6	11	12	32							
15	6	3	69	1	11	14	12	26							
21	1	8	48	0	9	16	12	30							

INDUSTRY 56	POPULATION	11403 11757 11603	STAYERS	7007 7049 6838	EXITS	2305 2740 2980

11	34	2	24	25	6	22	9	25	8	0	59	7	11	8	3
11	29	4	32	24	12	16	11	22	12	0	35	4	6	6	2
16	31	1	23	32	8	10	9	20	14	3	50	3	6	4	1
5	18	17	21	21	11	9	8	7	9	0	37	59	40	16	76
3	18	12	16	18	11	14	3	6	13	4	32	43	29	19	38
3	26	9	10	14	6	6	5	0	10	4	12	29	23	11	47
12	36	27	1	28	18	64	55	89	8	6	24	77	59	6	21
14	32	19	11	20	27	59	41	71	5	12	28	92	64	6	19
11	24	20	8	17	18	28	64	79	7	7	24	64	60	5	15
16	43	217	189	21	23	32	0	11	29	35	26	18	15	6	10
17	22	272	170	29	27	18	0	9	30	35	19	19	24	1	18
19	22	202	153	23	26	17	0	9	46	34	20	15	17	6	10
23	3	12	64	0	44	27	46	42							
21	4	12	63	2	44	20	37	30							
29	1	8	57	1	45	25	46	57							

INDUSTRY 57	POPULATION	4717 4948 4913	STAYERS	2885 2952 2947	EXITS	1010 1195 1349

0	1	0	1	1	2	3	2	5	0	2	3	15	4	5	7
3	0	0	4	1	1	2	2	4	1	2	2	3	2	4	3
3	0	0	1	4	3	0	0	11	2	0	5	7	6	5	1
77	0	2	5	0	1	8	2	0	0	0	3	2	2	3	4
88	0	0	4	1	3	6	2	1	1	0	1	6	2	1	5
38	1	0	3	0	3	8	0	0	0	0	3	2	3	2	6
1	13	2	2	4	8	2	1	7	2	1	6	2	3	0	9
0	6	0	0	12	4	8	1	8	6	1	5	2	9	3	12
0	7	3	0	6	5	2	1	4	2	0	3	4	4	0	8
3	1	39	21	23	71	179	12	0	33	33	24	12	4	3	5
0	2	37	27	40	58	138	10	0	24	46	25	16	10	8	3
1	4	31	16	17	45	104	13	0	18	37	27	20	4	11	0
24	6	13	42	11	5	6	5	24							
18	13	14	36	6	10	6	2	20							
13	3	10	26	5	13	8	7	18							

INDUSTRY 58	POPULATION	2991 3107 2912	STAYERS	1637 1588 1551	EXITS	670 756 772

0	5	0	2	3	2	5	3	7	3	1	4	3	5	5	0
1	1	1	1	4	1	2	2	10	3	0	6	2	0	7	1
7	5	0	2	3	4	5	1	6	2	0	1	2	0	5	2
2	2	1	11	1	1	8	1	2	3	1	7	2	6	0	7
1	8	2	7	2	1	7	1	0	2	0	1	8	4	0	7
2	4	2	7	2	2	9	0	1	0	1	5	2	6	1	7
3	26	3	0	8	9	12	7	87	1	3	5	10	8	0	10
2	20	8	0	12	3	14	9	79	2	3	10	12	7	1	8
2	15	4	1	7	14	4	8	67	0	2	3	8	3	0	3
6	4	16	141	11	20	16	27	20	0	35	6	10	4	2	7
4	3	18	145	14	31	34	50	19	0	20	8	8	4	8	6
4	3	22	105	14	14	28	20	28	0	19	10	8	5	6	3
13	0	2	9	4	22	5	5	4							
19	2	5	7	3	33	7	19	13							
13	1	2	12	1	11	6	8	9							

INDUSTRY 59	POPULATION	4898 5170 5192	STAYERS	2758 2832 2741	EXITS	1188 1309 1608

5	1	2	3	7	4	6	2	13	15	2	1	10	2	3	3
7	5	0	0	4	1	4	2	7	6	1	2	5	2	2	0
11	3	1	1	3	5	3	1	14	5	1	2	1	1	1	1
2	2	1	7	1	1	22	1	2	3	3	11	9	8	2	8
3	10	1	8	4	3	17	3	0	1	1	4	8	5	2	6
2	2	3	5	5	3	12	2	2	0	0	2	6	1	0	6
6	13	12	2	6	32	14	9	26	3	6	5	25	9	1	14
1	9	8	9	7	33	7	4	25	3	4	8	22	13	3	11
3	11	6	2	6	10	9	6	23	1	3	1	19	11	1	11
1	57	37	113	27	26	34	36	37	38	0	14	13	11	15	15
2	130	33	149	31	31	43	39	23	27	0	22	18	8	20	17
6	103	24	88	28	29	42	27	30	27	0	22	20	11	18	8
19	4	5	50	1	24	10	7	13							
19	5	6	56	0	14	16	8	21							
18	2	7	47	2	28	2	10	16							

INDUSTRY 60	POPULATION	10161 10711 10458	STAYERS	6786 6638 6879	EXITS	2486 3132 2759

4	7	0	2	4	4	5	6	13	3	1	6	1	6	6	1
3	1	1	5	7	3	3	3	9	7	1	5	4	1	3	2
1	1	0	2	5	3	2	3	9	2	0	5	2	5	1	2
8	2	2	5	9	5	17	2	2	6	0	8	9	13	2	21
4	9	3	6	10	1	17	2	2	3	0	7	7	17	6	12
6	3	3	1	8	1	12	2	1	2	2	4	7	8	1	8
3	23	9	10	21	17	24	7	11	9	3	6	12	10	3	26
1	17	7	9	17	11	9	6	12	17	2	7	10	5	5	30
14	14	3	5	12	11	11	1	5	10	1	2	8	9	3	16
9	14	12	55	9	27	4	19	12	7	12	0	107	13	9	11
14	6	16	43	11	19	6	22	12	10	18	0	110	22	11	10
12	55	8	41	19	31	11	26	13	8	16	0	86	16	19	9
88	1	6	15	0	24	24	18	19							
114	2	1	35	3	26	38	21	42							
77	2	4	21	0	25	29	26	29							

INDUSTRY	61	POPULATION	6810 7073 7191	STAYERS	4342 4345 4443	EXITS	1613 1860 1864

6	2	0	2	2	1	4	2	8	6	1	2	6	4	2	0
5	1	0	3	6	3	5	4	15	3	0	5	1	1	4	1
7	1	0	3	4	3	4	0	7	0	2	3	4	3	1	2
6	2	3	12	5	5	16	1	4	2	1	5	7	5	3	8
3	2	0	5	3	3	15	0	0	0	3	7	11	9	4	8
9	2	1	5	5	5	10	3	0	1	1	6	10	7	4	5
2	14	10	4	17	12	73	2	26	3	3	7	12	6	0	10
1	22	3	8	16	9	77	8	24	6	1	11	5	2	1	17
1	7	3	2	15	8	49	5	21	7	4	5	5	7	2	13
4	3	15	40	11	20	6	11	9	7	9	83	0	12	17	13
8	1	18	37	8	23	4	9	10	6	9	82	0	19	15	10
6	8	19	36	9	28	11	11	13	4	11	138	0	18	22	16
100	3	2	34	5	61	16	20	20							
91	2	4	31	4	54	43	18	21							
87	0	4	46	0	45	26	24	30							

INDUSTRY	62	POPULATION	3331 3742 4293	STAYERS	2135 2377 2690	EXITS	881 1035 1306

0	2	0	1	3	2	3	1	3	1	0	1	2	4	2	0
0	1	0	1	4	2	4	3	3	0	0	0	2	0	0	0
4	3	4	1	2	0	0	1	4	3	0	0	0	1	1	0
4	0	3	3	2	0	3	2	0	1	0	4	1	5	1	2
2	3	2	1	4	1	6	1	1	1	0	4	2	2	0	0
0	2	2	2	1	1	4	0	0	0	0	1	2	2	0	2
4	2	1	0	3	5	18	4	13	1	2	2	5	6	0	4
1	4	1	2	2	1	7	4	14	3	2	4	7	7	4	3
0	4	1	0	2	2	9	4	9	1	0	1	3	5	1	4
0	1	6	6	1	3	2	5	2	0	6	6	3	0	11	6
4	1	3	13	4	9	3	6	1	2	6	13	8	0	9	8
1	3	2	12	4	9	3	8	4	3	4	9	14	0	12	10
18	1	3	39	2	18	23	17	10							
18	0	4	29	1	10	18	38	6							
13	0	1	11	1	18	14	41	11							

INDUSTRY	63	POPULATION	3714 4111 4531	STAYERS	2306 2513 2604	EXITS	1048 1246 1565

1	2	0	0	2	1	0	3	4	2	2	2	0	1	2	2
6	0	1	3	1	2	0	5	2	0	2	0	2	2	2	2
3	2	0	1	0	1	2	3	7	0	0	0	2	1	0	1
4	0	4	4	0	2	4	0	0	1	1	2	1	1	1	2
1	1	0	4	2	1	4	1	0	0	0	0	3	5	0	5
4	1	0	0	0	3	3	1	0	0	0	0	6	0	1	1
0	5	1	1	2	16	3	2	4	2	2	0	6	2	0	3
0	0	0	0	1	3	2	2	4	6	1	3	1	4	0	2
1	0	1	0	2	13	5	1	9	4	0	5	0	1	0	6
3	1	6	7	4	11	4	1	5	1	10	13	28	8	0	5
2	3	4	7	12	14	5	4	3	0	14	12	18	15	0	11
1	2	4	4	8	8	11	2	3	2	17	10	24	16	0	7
18	2	5	38	3	31	25	17	14							
27	1	7	41	3	22	13	18	10							
19	2	5	34	2	21	17	33	19							

INDUSTRY 64	POPULATION	2454 2539 2642	STAYERS	1226 1275 1282	EXITS	646 764 889

6	5	1	6	2	2	1	1	6	4	0	1	1	7	1	2
3	9	3	2	1	3	4	1	4	3	0	1	2	1	3	1
4	3	2	3	1	1	0	2	6	6	1	0	1	0	0	0
5	2	2	6	3	4	3	0	1	3	1	5	4	2	3	2
2	4	2	6	1	5	4	1	5	0	0	2	5	2	4	4
3	2	1	4	5	5	14	0	3	0	1	4	4	5	3	7
6	7	3	1	2	14	25	6	11	2	1	7	11	4	0	8
1	11	3	0	5	8	13	9	14	2	6	3	15	7	1	9
2	6	3	1	6	4	15	3	13	0	6	5	7	11	1	4
2	5	6	16	6	9	9	18	6	3	22	8	18	12	17	0
4	1	11	10	12	15	4	11	6	8	18	14	17	4	8	0
2	4	10	12	13	10	6	13	3	3	17	14	13	12	4	0
12	2	7	90	36	44	13	13	8							
17	3	6	56	8	30	10	17	15							
11	4	3	59	7	31	4	17	21							

INDUSTRY 65	POPULATION	6839 8103 8232	STAYERS	3795 4170 3722	EXITS	1986 2675 3059

1	6	0	6	30	8	3	2	18	8	2	5	0	4	3	3
4	15	1	9	24	1	3	4	16	9	1	2	1	6	4	1
7	6	1	3	31	2	7	3	10	6	3	4	5	2	2	1
7	4	3	9	8	7	49	6	0	4	3	16	11	14	8	12
9	5	4	10	7	12	46	3	4	2	4	20	19	17	4	13
8	2	3	9	12	4	48	7	2	6	4	11	12	23	11	7
4	21	10	5	21	37	29	19	35	7	7	8	18	13	3	21
1	29	8	11	22	35	30	23	34	12	12	16	26	24	1	31
0	29	8	5	27	36	29	10	24	10	5	8	23	20	1	26
9	6	17	71	9	18	7	20	7	14	10	73	50	16	24	8
15	6	24	73	11	43	12	14	7	14	18	87	77	29	17	7
16	15	24	86	20	47	8	17	16	16	19	87	77	23	27	13
0	1	3	16	3	64	42	26	26							
0	3	2	21	0	78	48	32	25							
0	0	4	26	1	78	214	47	47							

INDUSTRY 66	POPULATION	2033 2384 2401	STAYERS	1312 1477 1460	EXITS	590 772 783

1	1	0	0	0	0	0	0	2	0	0	0	1	1	0	0
0	2	0	1	1	0	0	0	5	0	0	0	2	0	0	1
1	2	0	1	0	1	0	2	2	0	0	0	0	1	1	2
4	1	1	0	1	0	1	0	0	1	0	0	0	0	0	2
8	1	0	0	0	2	4	0	0	0	0	3	1	0	0	0
2	1	1	0	0	1	3	0	0	0	0	0	2	0	2	1
1	6	0	0	1	2	2	0	3	1	0	2	3	1	0	1
0	8	1	0	0	3	2	0	3	0	1	2	1	1	0	2
1	2	1	0	1	2	2	0	2	1	1	1	0	2	1	4
2	0	1	1	2	15	2	2	5	1	3	5	5	1	3	2
2	1	1	4	4	6	4	1	3	2	4	2	2	2	2	3
1	0	8	2	4	14	6	2	4	2	13	8	3	1	2	2
6	0	8	15	0	3	1	1	7							
3	0	4	13	7	4	0	2	4							
1	0	7	9	1	3	3	1	14							

INDUSTRY 67	POPULATION	3207 3397 3277	STAYERS	1945 2000 1906	EXITS	843 974 1010

3	2	0	2	2	5	7	3	14	0	0	0	7	2	10	8
2	1	1	1	3	0	5	1	15	1	1	3	4	3	9	4
1	0	1	2	0	5	3	7	6	5	1	0	4	3	6	6
22	2	5	4	2	5	4	0	1	1	1	6	8	3	3	7
20	1	2	10	2	2	6	0	1	0	2	3	5	4	0	1
20	1	2	4	1	5	7	0	0	0	0	3	3	1	2	2
1	9	5	0	5	14	2	1	5	0	0	2	4	9	0	1
1	17	1	1	7	11	1	2	6	0	2	4	11	11	2	5
0	7	1	1	6	9	6	1	3	2	0	2	7	4	0	6
0	3	9	11	16	11	12	20	15	6	5	3	5	2	8	3
0	0	8	12	10	7	6	10	15	3	9	7	12	3	7	5
4	2	8	12	14	9	5	8	14	2	11	3	7	5	10	8
5	17	0	35	3	11	9	3	10							
2	10	0	58	0	12	7	1	16							
5	4	0	44	0	12	0	3	15							

INDUSTRY 68	POPULATION	15274 16675 17089	STAYERS	8633 8987 8854	EXITS	4660 5676 6260

5	26	0	6	19	15	22	17	53	8	2	8	15	21	15	7
26	38	1	14	12	18	19	16	63	7	4	4	12	25	12	5
20	24	4	15	18	18	12	22	55	13	1	5	12	11	14	14
33	7	12	26	12	13	20	3	1	7	1	20	24	15	6	19
27	8	9	23	15	20	28	3	1	6	5	19	18	22	4	26
35	14	15	15	14	14	22	5	4	7	6	18	10	16	4	24
6	32	12	2	12	27	50	48	48	6	14	117	25	27	2	29
4	41	5	2	17	23	37	27	53	13	15	31	27	30	6	41
4	39	18	2	19	29	32	23	42	5	15	46	21	40	1	24
11	7	37	53	122	44	86	64	36	15	56	37	46	31	39	69
11	5	40	40	107	68	64	85	29	17	79	29	47	40	51	70
11	9	36	54	90	59	92	56	30	19	70	35	46	41	38	57
18	15	62	0	16	100	30	17	55							
32	21	38	0	19	110	35	37	56							
29	18	49	0	17	97	43	32	106							

INDUSTRY 69	POPULATION	526 564 527	STAYERS	251 288 243	EXITS	134 163 154

1	3	1	1	0	0	0	3	2	0	1	0	0	0	3	0
0	0	2	0	1	0	0	1	2	0	0	0	0	0	1	0
1	0	0	0	0	0	0	0	1	0	1	1	1	0	2	1
2	1	1	0	2	0	2	0	0	0	0	0	0	0	0	1
2	1	0	0	1	0	0	0	1	0	0	1	0	1	0	0
3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1
0	1	0	0	0	2	3	2	4	0	0	0	1	3	0	1
0	1	0	0	0	0	2	0	0	0	1	0	0	2	1	0
0	1	0	0	0	0	4	2	0	0	0	1	0	2	0	0
0	1	3	2	3	4	1	3	3	2	0	0	4	0	4	8
0	0	1	4	2	2	0	0	9	2	1	0	4	0	4	30
0	0	0	3	1	3	0	3	11	1	1	1	5	0	7	17
2	4	10	22	0	18	1	0	5							
1	2	0	16	0	9	1	3	1							
3	0	1	17	0	20	2	6	3							

INDUSTRY 70	POPULATION	5541 5813 6199	STAYERS	2830 3034 3248	EXITS	1188 1612 1818

5	11	1	13	8	7	4	3	23	6	2	5	4	5	3	3
6	7	1	5	7	6	6	2	13	3	0	5	3	7	1	2
6	8	2	6	7	4	3	7	11	5	1	0	5	2	3	2
5	6	7	13	3	6	21	5	3	3	4	24	46	18	9	6
8	7	4	8	4	5	13	4	2	1	2	22	54	12	9	19
9	14	0	6	8	5	17	6	4	1	1	23	22	13	5	12
11	21	12	0	11	9	36	36	75	4	334	19	27	25	2	11
3	24	10	1	14	21	30	36	62	2	8	8	42	20	1	20
6	10	11	2	12	9	29	35	70	5	10	8	20	15	0	17
9	2	21	75	11	13	2	37	8	21	16	23	55	25	10	45
11	7	13	88	7	15	7	36	6	9	21	29	46	22	21	31
7	3	25	85	14	20	10	27	6	13	25	20	51	26	24	51
55	3	14	86	4	0	33	20	20							
64	5	7	80	3	0	44	21	24							
55	2	15	67	5	0	39	35	31							

INDUSTRY 71	POPULATION	6039 6453 6695	STAYERS	3026 3252 3007	EXITS	2187 2499 3028

2	13	5	7	7	1	4	4	7	0	1	0	1	8	0	1
4	48	14	8	2	3	0	7	5	1	1	0	1	2	2	0
11	18	17	7	8	3	8	1	4	7	0	0	1	1	1	0
4	7	3	4	11	4	3	1	0	2	1	8	6	7	0	7
1	6	1	1	7	3	4	4	2	3	1	4	1	5	2	1
1	11	3	2	11	1	4	1	4	0	0	0	1	2	0.	4
12	8	6	2	3	9	34	25	23	3	4	10	12	91	1	18
4	6	2	2	8	6	35	21	31	3	9	14	12	58	0	22
3	9	1	2	5	4	32	16	20	2	8	5	12	51	0	18
15	3	5	22	12	16	5	16	1	7	6	10	9	16	14	9
5	5	7	12	4	13	5	16	3	1	4	17	15	22	24	17
7	2	9	13	16	18	8	9	5	3	5	17	15	26	11	10
167	1	1	36	1	26	0	26	12							
26	1	1	28	4	38	0	39	18							
36	0	4	29	0	41	0	31	25							

INDUSTRY 72	POPULATION	7727 7453 7470	STAYERS	3990 3869 3790	EXITS	2349 2351 2723

8	96	8	11	19	2	7	8	10	3	2	2	4	5	1	0
12	91	5	7	14	1	3	6	7	1	2	2	1	2	2	0
12	52	16	9	14	0	5	13	3	1	1	0	0	2	0	0
1	19	11	5	12	3	4	4	4	5	1	11	12	7	2	11
2	24	5	9	10	3	3	4	3	7	0	16	11	9	2	8
1	18	6	9	4	2	5	3	1	2	3	3	5	6	4	4
2	11	16	0	8	9	57	70	56	1	21	27	31	238	3	10
4	6	7	2	3	6	50	37	47	5	14	15	21	195	4	15
1	8	9	1	7	4	55	24	30	2	6	9	21	108	4	7
108	2	14	26	14	16	3	19	4	8	2	7	11	58	16	16
151	4	11	26	6	15	6	23	5	10	7	9	13	38	33	14
105	2	11	25	15	14	9	18	3	7	8	9	9	36	17	21
27	2	6	23	4	29	42	0	73							
25	1	4	22	0	25	40	0	42							
24	1	0	19	3	16	30	0	55							

INDUSTRY	73	POPULATION				10827 3192 2442		STAYERS			174 52 57	EXITS		5385 1536 1258	
28	703	147	58	53	29	25	109	58	15	5	7	25	33	33	20
9	112	18	13	18	6	11	30	31	3	1	0	7	8	8	6
19	31	12	13	8	7	5	14	13	6	5	6	10	15	8	6
113	124	46	40	37	17	33	19	10	21	3	61	46	26	16	27
32	36	8	15	19	10	13	2	3	4	0	22	16	22	9	15
31	17	5	24	9	6	11	10	1	2	3	16	25	24	1	20
52	56	42	2	26	54	422	188	287	3	60	56	103	75	12	32
6	16	16	1	9	21	111	54	91	2	26	24	38	31	6	15
4	33	7	1	18	21	47	22	59	2	4	9	16	14	1	12
35	19	79	134	73	58	90	137	51	40	51	38	36	33	31	48
16	3	28	27	29	47	37	45	27	8	17	18	22	21	17	14
16	2	14	27	22	21	20	32	17	13	22	33	27	12	10	9
76	30	34	281	12	83	125	217	0							
36	7	12	75	6	21	25	72	0							
20	5	17	52	4	30	14	35	0							

APPENDIX E

PROVINCIAL MOBILITY MATRICES

This Appendix reports the interprovincial mobility data for 1965-66, 1966-67, and 1967-68 as well as the return mobility for 1966-67 and 1967-68 (return mobility occurs when a person who migrated in 1965-66 or 1966-67 returns to the original province in 1966-67 and 1967-68 respectively). These data are presented in a manner similar to that of the industrial mobility data in Appendix D. Each "cell" represents mobility from the province designated on the left-hand side of a particular row to the province at the top of the column. The figures in each cell are listed in chronological order: 1965-66, 1966-67, and 1967-68 for mobility, and 1966-67 and 1967-68 for return mobility. For example, 27 persons moved from Prince Edward Island to Ontario between 1966 and 1967. The three columns on the right (not reported for return mobility) indicate the sample size, number of stayers, and number of exits for the corresponding province named on the left.

Table E-1

INTERPROVINCIAL MOBILITY

	NFLD	PEI	NS	NB	PQ	ONT	MAN	SASK	ALB	BC	POP	STAYERS	EXITS
NFLD	0	11	33	20	53	153	2	2	2	7	7039	5029	1727
	0	66	32	15	93	131	2	0	3	5	8018	5548	2123
	0	7	37	8	27	125	2	2	9	4	8009	5023	2765
PEI	57	0	36	14	2	29	1	0	3	1	1319	836	340
	11	0	18	8	1	27	3	0	1	4	1319	809	437
	22	0	16	9	3	20	0	0	0	1	1340	812	457
NS	29	14	0	106	38	232	5	3	19	21	12803	9460	2876
	44	24	0	87	45	198	1	2	24	25	13044	9520	3074
	29	8	0	117	39	165	12	4	15	24	13111	9269	3429
NB	11	12	87	0	93	162	5	2	5	11	9635	6963	2284
	17	10	114	0	115	132	7	0	5	9	10201	7065	2727
	14	8	69	0	78	125	5	2	5	17	9808	6890	2595
PQ	98	2	42	115	0	1064	61	12	44	90	107772	82196	24048
	59	4	44	123	0	1339	43	18	43	89	110269	82314	26193
	45	3	43	109	0	1016	52	17	58	97	109247	79342	28465
ONT	82	20	126	90	1227	0	198	63	149	313	146404	111277	32859
	84	21	158	77	1029	0	284	52	146	312	153897	114829	36905
	97	15	138	115	751	0	207	76	166	318	155687	114431	39373
MAN	2	0	5	4	23	264	0	211	104	164	16443	12098	3568
	1	0	9	2	35	206	0	109	110	166	17018	12337	4040
	1	2	2	4	24	245	0	105	111	124	17411	12005	4788
SASK	2	0	3	1	7	62	108	0	184	93	10208	7479	2269
	1	2	4	1	10	81	131	0	206	95	11270	7749	2990
	0	0	3	0	12	47	122	0	216	89	11226	7709	3028
ALB	1	0	7	1	25	122	68	169	0	461	21975	14895	6226
	13	1	12	2	52	133	76	174	0	382	22634	15206	6583
	4	0	12	1	31	110	58	129	0	341	23568	15335	7547
BC	3	1	12	5	31	157	31	36	248	0	37580	27660	9396
	3	1	11	5	71	201	61	47	287	0	39504	28750	10067
	3	1	7	9	52	221	69	69	305	0	40587	28554	11297

Table E-2

INTERPROVINCIAL RETURN MOBILITY

	NFLD	PEI	NS	NB	PQ	ONT	MAN	SASK	ALB	BC
NFLD	0	37	5	1	48	9	0	0	0	1
	0	5	11	2	13	17	0	0	0	0
PEI	2	0	4	4	0	3	0	0	0	0
	0	0	3	1	1	4	0	0	0	0
NS	10	10	0	24	5	14	0	1	2	2
	4	2	0	33	7	26	4	1	2	0
NB	5	5	47	0	27	8	1	0	0	0
	5	2	21	0	26	14	1	0	0	1
PQ	15	0	6	21	0	353	5	3	5	9
	11	0	13	25	0	272	13	3	14	12
ONT	25	4	40	13	266	0	52	11	22	31
	19	6	37	22	218	0	53	12	26	33
MAN	0	0	0	0	3	45	0	28	15	11
	0	0	0	1	4	90	0	24	18	9
SASK	1	0	1	1	2	16	33	0	38	4
	0	0	1	0	4	7	19	0	46	4
ALB	1	0	2	1	16	24	20	41	0	46
	1	0	6	0	8	28	11	32	0	52
BC	1	0	3	1	12	38	12	4	66	0
	2	1	1	2	7	46	23	10	74	0

APPENDIX F

OTHER EXPLANATORY DATA

This Appendix reports most of the data used to attempt to explain industrial and provincial mobility; where information is not available, the following tables are marked N.A. The population variable used to convert the raw mobility figures into mobility rates was the 1966 sample net of "no records" where the "no records" were persons in the insured population in 1966 but not in 1967 ("Exits").

Alternative definitions of income were used as explanatory variables. Full-time income is the wage and salary income (averaged over two years, 1966 and 1968) of persons in the sample who were employed 50 to 52 weeks of the year. Average income is the average wage and salary income (averaged over two years, 1966 and 1968) of all persons in the sample regardless of the number of weeks actually employed. Both of these sets of income data were made available by the Unemployment Insurance Commission upon request. A third income variable, total earned income, was employed in explaining provincial mobility. This variable was obtained from the National Accounts of Canada by summing wage and salary income, unincorporated business income, and farm income and dividing the total by the number of persons employed (*The Labour Force*).

The percentage of females in an occupation or industry was obtained by dividing the number of females in the particular group in 1966 by the total sample population (including "no records"). The percentage of claimants -- persons 15 to 24 years of age, and persons over 64 -- was defined in an analogous manner. This information is derived from the sample of the insured population.

Four different measures of education were derived for occupations: years of schooling, age of entry to the occupation, years of general educational development (GED) and years of specific vocational preparation (SVP). The years of schooling were obtained from the *1961 Census of Canada*. The age of entry was obtained from the same source and is defined as the minimum age, which includes 10 per cent of the labour force of an occupation.

Table F-1

OCCUPATIONAL MOBILITY DATA

NUMBER	1966 SAMPLE	1967 NO RECORD	FULL TIME INCOME	AVERAGE INCOME	PERCENT FEMALE	PERCENT CLAIMANTS	YEARS OF SCHOOLING	AGE OF ENTRY	YEARS OF G.E.D.	YEARS OF S.V.P.	PERCENT 15-24 YRS	PERCENT OVER 64 YRS
1	8477	2973	5637	5342	12.56	3.08	10.53	29.97	14.70	5.02	7.59	3.77
2	2641	1139	5046	4476	41.95	2.61	13.76	21.46	16.17	3.55	19.61	2.23
3	1738	663	5398	5044	4.32	1.21	12.21	21.20	13.16	3.00	39.70	0.86
4	2305	836	5006	4906	20.48	1.82	13.58	25.66	16.19	4.67	23.43	3.90
5	624	245	4624	3913	42.31	4.97	12.54	21.83	14.71	3.32	26.60	3.04
6	2476	822	5700	5183	8.32	1.17	11.81	21.31	12.00	1.50	37.48	0.73
7	799	351	5770	5106	28.04	3.13	12.49	23.74	16.00	5.00	14.27	4.38
8	8993	2292	3832	3176	78.55	5.79	11.10	19.61	10.50	0.38	33.79	2.11
9	3009	748	4111	3556	80.43	5.18	10.91	19.47	9.00	0.38	37.62	0.70
10	3088	659	4938	4416	12.89	3.56	9.44	19.85	9.00	0.38	24.48	3.53
11	4296	839	5007	4481	9.54	3.65	9.17	20.76	9.00	0.43	25.07	3.38
12	11690	2865	4061	3574	98.10	2.92	11.65	19.39	9.00	0.75	37.66	1.44
13	5866	1582	3715	3024	96.91	4.74	10.99	18.64	9.00	0.38	51.64	0.60
14	35582	9507	4110	3587	59.59	3.60	10.79	19.50	10.52	0.75	36.81	2.36
15	2111	660	5255	4975	13.83	2.32	9.67	24.09	10.15	0.64	9.00	3.03
16	3353	1255	5643	5415	2.03	1.85	11.10	25.70	12.00	0.75	12.53	2.59
17	1810	478	4294	3393	1.16	4.48	8.96	15.90	8.54	0.14	48.01	2.15
18	19668	4933	3384	2543	68.56	4.48	9.67	18.55	9.00	0.17	28.14	2.71
19	1084	456	4758	4482	16.70	2.77	11.43	25.55	12.00	1.47	26.29	3.69
20	762	262	5585	5096	1.18	1.44	9.84	21.04	11.03	0.38	15.49	3.02
21	2819	764	4512	3582	2.27	10.18	9.39	20.52	9.46	0.84	3.72	28.70
22	4582	1406	4143	3205	36.67	10.24	8.03	23.57	9.40	0.68	12.42	4.74
23	8181	2850	2788	1876	76.67	6.88	8.49	17.90	7.00	0.04	27.69	1.82
24	6477	2175	3169	2202	63.49	9.71	8.14	18.16	7.70	0.56	22.82	4.42
25	2331	752	3322	2656	69.46	3.95	8.75	19.34	10.50	7.50	55.94	1.63
26	2666	773	3164	2388	78.24	6.08	7.52	19.41	7.00	0.23	25.58	2.03
27	7862	2010	4037	3273	26.33	6.69	9.66	23.58	7.16	0.18	8.48	10.86
28	1667	283	6036	5595	3.24	2.22	9.55	27.36	12.00	1.69	6.90	3.90
29	2087	165	7548	6856	0.43	2.54	9.06	28.88	9.86	1.60	8.62	3.02
30	1239	292	7145	5707	0.40	8.47	8.34	22.61	9.94	1.45	13.88	3.95
31	2366	423	6292	4998	1.78	2.70	8.14	26.66	9.29	0.36	5.11	2.07
32	4348	954	4848	4234	1.43	3.06	8.50	18.00	9.00	0.04	23.34	1.40
33	10561	2235	5809	4795	0.29	7.25	7.62	22.40	9.00	0.17	13.19	1.09
34	713	220	4772	4028	6.73	18.51	10.07	22.69	10.04	0.92	25.39	2.24
35	2691	667	3749	3072	97.29	6.17	10.14	19.04	9.00	0.17	35.71	1.45
36	1078	298	4551	3648	5.84	5.01	9.04	17.83	7.89	0.16	35.62	7.98
37	374	129	3863	2606	8.56	26.20	7.27	20.29	10.20	2.00	22.73	5.61
38	1167	356	4666	3097	2.91	5.91	7.58	19.96	7.17	0.34	21.94	8.83
39	4959	1844	6283	3407	0.18	38.58	6.41	19.59	7.61	0.37	24.34	1.73
40	2164	722	4671	1575	0.74	60.49	5.94	20.64	7.00	0.19	17.14	4.53
41	3998	772	6782	5901	0.20	2.63	7.81	23.39	10.63	3.16	14.31	1.23
42	1520	336	6039	4661	0.26	8.62	7.40	21.44	6.74	0.77	28.68	2.17
43	994	167	4799	4333	12.88	3.52	8.11	20.70	9.00	1.50	19.72	2.82
44	1482	290	5143	4556	1.89	4.05	8.15	21.53	9.00	0.75	18.62	3.64

(cont'd.)

Table F-1 (concl'd.)

45	1620	444	4724	2502	53.33	12.72	7.11	18.64	8.64	0.68	25.06	3.02
46	1773	305	5262	4511	23.12	4.00	8.06	20.42	9.00	0.75	19.23	2.43
47	1192	297	5807	4791	22.57	3.36	7.89	21.74	8.52	1.11	23.32	1.59
48	1807	367	3886	3230	55.89	4.43	7.18	18.72	9.00	1.50	30.60	2.71
49	2297	459	4151	3406	50.46	4.14	7.42	19.42	9.04	0.83	29.60	1.87
50	1445	76	4281	3519	37.79	3.67	7.59	19.47	8.82	0.76	30.17	1.31
51	1979	411	4298	3443	53.51	7.58	7.98	23.16	9.00	2.35	14.35	6.16
52	7026	1699	3236	2527	92.23	6.45	7.11	18.85	7.00	0.38	27.77	2.33
53	1842	383	4127	3258	52.66	4.56	7.46	19.36	7.71	0.77	29.04	4.23
54	7459	2041	6463	4885	0.28	13.93	7.45	25.40	12.00	3.00	8.15	4.01
55	2385	451	5242	4382	4.03	9.18	7.68	21.52	9.64	1.26	16.77	3.65
56	1581	328	5392	4497	10.25	3.73	7.59	20.61	9.00	0.38	24.29	3.48
57	3730	475	6604	6022	8.82	1.66	5.85	23.17	8.40	0.69	15.90	1.64
58	1162	151	6395	5973	5.34	2.15	9.92	20.27	10.50	3.00	19.28	2.58
59	2205	348	6330	5479	30.61	3.22	9.16	20.46	11.55	2.98	21.13	2.72
60	3140	345	6415	5786	3.95	1.85	7.61	25.48	9.85	2.03	11.85	2.39
61	4304	583	6568	5997	0.74	1.70	9.10	24.85	11.65	2.14	15.08	3.49
62	1024	154	7918	7204	0.10	6.25	8.28	28.73	12.00	3.00	3.71	2.73
63	3631	489	5986	5233	11.46	2.53	8.33	23.79	10.50	1.50	22.67	1.87
64	3602	455	5983	5230	6.97	2.64	8.04	23.70	9.00	0.56	18.27	2.03
65	2897	561	7418	6555	0.35	5.14	8.37	21.93	12.00	3.00	18.88	1.48
66	2792	478	6521	5646	3.69	4.44	8.34	22.25	11.31	2.45	18.41	2.36
67	3868	630	6575	5755	0.75	2.84	8.17	23.55	9.00	0.38	16.88	0.96
68	2235	401	5704	4927	12.93	2.42	7.78	22.38	8.57	1.21	20.67	1.74
69	6319	1231	5553	4941	0.28	2.22	8.40	21.46	12.00	3.00	23.58	1.42
70	8046	1430	6300	5712	0.78	2.70	8.55	24.14	10.62	2.87	13.24	2.81
71	4093	753	7214	6355	0.46	2.98	9.53	22.13	11.91	2.98	21.28	1.32
72	3071	510	5013	4190	52.39	3.09	8.52	21.57	12.00	3.00	28.66	0.78
73	3740	708	6700	5916	11.23	2.14	9.87	22.37	11.77	2.80	25.40	1.31
74	2999	655	5978	4475	1.63	6.24	7.94	22.85	9.00	3.00	14.64	2.77
75	1241	335	7647	6363	0.48	9.43	8.64	28.11	12.00	7.00	6.93	5.40
76	3311	804	6914	5340	0.30	9.51	7.36	22.74	11.05	1.97	13.41	1.51
77	908	269	5534	4747	17.95	2.97	7.92	21.42	9.62	1.03	21.92	1.10
78	2078	503	6480	5887	0.19	5.05	8.28	28.09	16.31	1.30	5.44	7.56
79	1637	247	7012	6052	0.18	5.44	7.66	28.40	9.00	0.88	8.92	2.14
80	2656	584	6501	5359	0.41	10.84	7.46	23.11	9.00	0.38	11.63	1.24
81	2617	448	6096	5107	0.42	8.41	7.79	22.51	7.00	0.33	15.36	2.37
82	1017	169	7581	5252	0.10	19.67	6.88	23.40	7.00	0.04	16.03	3.64
83	4474	1016	5026	4263	1.86	4.36	7.81	18.86	5.00	0.04	31.05	2.01
84	1803	279	5223	4128	0.06	3.72	6.37	25.59	7.00	0.38	11.65	3.83
85	4437	1159	6250	5959	9.62	2.93	N.A.	N.A.	N.A.	N.A.	4.30	3.00
86	10661	2177	4827	3821	47.69	6.18	7.13	22.66	9.20	6.62	24.98	1.97
87	53166	13859	5080	3656	10.72	8.36	7.29	18.90	6.23	0.40	30.49	2.70
88	3223	1050	4969	2363	23.92	11.14	N.A.	N.A.	N.A.	N.A.	36.24	3.01

Table F-2

INDUSTRIAL MOBILITY DATA

NUMBER	1966 SAMPLE	1967 NO RECORD	FULL TIME INCOME	AVERAGE INCOME	PERCENT FEMALE	PERCENT CLAIMANTS 1966	YEARS OF SCHOOLING	AGE OF ENTRY	PERCENT PENSION	PERCENT UNION	PERCENT 15-24 YRS	PERCENT OVER 64 YRS
1	1128	373	3886	2683	15.78	14.27	7.37	20.23	N.A.	0.00	25.27	5.50
2	6979	2491	6429	3629	2.44	36.57	6.96	20.00	52.20	71.50	22.58	3.41
3	2242	753	4837	1646	1.03	59.10	6.19	20.75	N.A.	17.73	16.90	4.37
4	4862	1001	6704	5788	2.78	2.71	8.32	22.68	57.70	74.30	18.82	1.85
5	4008	965	6102	5147	7.11	6.19	9.06	22.70	77.60	40.60	18.91	2.22
6	3048	705	5505	4493	26.15	3.67	8.61	21.59	87.00	63.80	20.18	2.17
7	3220	747	4972	4354	16.12	3.23	8.86	20.72	74.50	55.90	21.61	2.67
8	3264	1002	4680	2612	39.89	14.46	7.77	19.34	38.00	46.20	24.94	4.07
9	7423	1522	4938	3936	33.68	3.95	8.56	17.10	70.20	51.70	24.21	2.42
10	2354	575	5674	4801	13.51	2.72	9.25	20.92	87.00	45.20	24.43	1.66
11	873	120	5468	4681	55.10	10.19	8.39	22.24	100.00	72.50	16.49	2.06
12	2397	549	5468	4710	24.91	2.92	8.94	22.35	87.50	64.60	24.95	1.50
13	2990	644	4085	3303	50.74	4.25	7.93	18.59	29.60	45.20	30.50	2.98
14	4688	761	4577	3901	32.66	3.80	8.17	19.89	79.10	71.40	30.42	2.22
15	2503	623	4267	3637	48.02	4.75	8.51	20.19	79.10	71.40	31.20	2.64
16	2219	633	3593	2905	71.25	4.64	8.16	18.97	24.40	22.40	31.82	2.25
17	9333	2210	3601	2792	76.92	5.97	7.82	19.13	22.80	47.70	28.47	3.26
18	4089	996	5735	4148	2.18	12.62	7.66	20.88	34.60	60.00	22.08	4.01
19	2957	611	5117	4153	12.48	4.73	8.23	20.63	31.40	62.50	25.46	3.15
20	4548	953	4643	3889	17.22	4.09	8.26	20.98	33.20	38.90	25.70	3.47
21	7140	1021	6773	6012	7.16	2.79	8.84	23.38	97.00	85.20	17.10	2.06
22	2887	627	5138	4404	33.29	3.29	9.10	20.62	83.80	59.40	26.22	1.59
23	6702	1314	5713	4915	34.29	3.48	10.22	18.48	80.00	36.40	25.31	2.92
24	4204	460	6859	6298	5.35	1.59	8.94	24.34	93.30	69.80	17.84	2.45
25	1434	214	5962	5335	5.79	3.42	8.18	24.86	68.60	75.10	16.25	3.84
26	3472	385	6635	6059	4.69	0.86	8.83	24.97	94.20	76.00	15.03	1.12
27	1083	197	5851	5172	8.96	1.94	9.17	22.96	94.20	76.00	18.10	1.75
28	5817	1191	5963	5230	10.02	3.01	9.06	22.65	63.60	54.30	23.14	1.91
29	5948	1202	5680	4885	15.62	2.87	9.12	22.56	66.10	46.80	24.14	2.82
30	5785	1107	5779	5066	12.74	2.39	9.80	23.21	84.70	53.30	21.24	2.47
31	2540	495	6147	5543	11.10	2.05	10.11	24.92	83.90	64.60	15.43	2.40
32	7917	1215	6563	5726	11.81	1.95	9.16	24.62	86.00	76.30	21.33	2.02
33	3128	626	5556	4712	3.68	3.16	8.48	25.03	78.40	79.90	16.78	4.19
34	9710	2054	5268	4621	35.49	2.67	9.87	22.43	84.60	59.90	25.55	1.52
35	5055	1205	5807	4975	11.22	2.29	8.45	22.38	73.60	54.70	18.52	1.82
36	1072	261	6808	6142	27.24	2.05	10.74	23.85	99.50	27.00	23.32	1.40

(cont'd.)

Table F-2 (concl'd.)

37	5155	1103	5419	4792	28.90	2.48	10.26	22.64	91.20	35.50	23.24	1.57
38	5598	1279	4631	3873	40.80	4.09	9.34	20.33	73.60	54.70	27.81	2.54
39	10994	3211	6631	4571	2.72	13.17	7.94	22.57	N.A.	52.40	15.77	2.94
40	6749	2011	7186	5243	2.61	10.00	8.04	21.83	N.A.	52.40	16.77	1.84
41	14822	3630	6665	5109	3.28	7.52	8.27	21.86	N.A.	52.40	22.63	1.57
42	1043	422	5240	4962	35.47	2.59	11.11	22.21	96.10	68.10	31.16	0.77
43	2810	611	6847	5362	6.55	12.03	8.33	22.95	64.70	71.50	16.19	3.99
44	13079	1498	5884	5148	5.63	2.34	8.76	24.56	99.70	83.30	14.78	2.78
45	6832	1541	5804	4775	5.81	5.24	8.11	22.16	44.40	50.10	17.14	1.35
46	5295	1177	5685	4384	9.48	6.35	N.A.	N.A.	91.70	82.90	13.69	3.85
47	1004	251	5390	4913	11.06	3.49	8.98	22.49	98.20	29.90	19.12	4.08
48	6483	1657	4733	4179	55.22	3.50	10.51	20.53	94.60	65.50	41.08	0.85
49	4399	930	6539	5754	16.53	3.11	9.86	22.32	99.40	76.00	18.94	1.95
50	1761	461	4500	4191	24.59	3.58	10.26	21.95	69.70	12.20	21.69	2.33
51	6213	1448	4597	3875	28.38	5.07	9.18	21.02	69.70	12.20	26.70	2.78
52	12315	3113	4735	4115	22.77	3.74	10.25	21.66	69.70	12.20	24.88	3.05
53	9562	2821	4201	3171	43.13	3.62	9.02	17.83	81.80	88.00	42.17	1.16
54	10934	2285	3682	2877	71.68	3.11	9.98	19.64	78.30	8.70	22.45	2.25
55	5915	1677	3257	2480	71.09	6.54	9.26	18.06	78.30	8.70	33.20	2.18
56	11757	2740	4892	4124	8.49	3.37	9.00	20.18	25.00	11.30	30.02	2.32
57	4948	1195	3460	2558	74.25	5.19	9.68	20.09	78.30	8.70	22.78	4.53
58	3107	756	4269	3602	28.58	4.09	9.82	21.10	78.30	8.70	23.91	3.67
59	5170	1309	3691	2935	55.51	5.15	10.21	19.70	78.30	8.70	24.91	3.85
60	10711	3132	3927	3594	65.78	2.75	11.39	19.20	38.70	0.10	46.29	2.18
61	7073	1860	3855	3440	67.30	3.49	11.11	20.59	38.70	0.10	37.18	4.23
62	3742	1035	4491	3688	44.95	3.26	12.60	21.46	N.A.	30.80	15.53	4.94
63	4111	1246	3457	2795	88.45	5.38	10.90	19.90	79.00	37.60	23.67	3.70
64	2539	764	4073	2916	32.34	8.74	10.72	20.17	N.A.	9.00	22.29	9.10
65	8103	2675	4380	3546	57.62	2.97	12.74	21.20	48.00	9.00	36.54	2.30
66	2384	772	3318	2639	67.03	4.91	N.A.	N.A.	N.A.	N.A.	54.61	1.93
67	3397	974	2750	1613	67.74	6.18	8.20	19.83	17.00	24.60	25.79	2.33
68	16675	5676	3549	2642	57.93	8.84	8.32	19.56	27.10	20.50	21.75	4.10
69	564	163	3241	2308	35.64	6.21	N.A.	N.A.	N.A.	N.A.	15.07	10.28
70	5813	1612	4577	3675	32.34	4.47	9.59	22.72	N.A.	9.00	15.17	9.82
71	6453	2499	4866	3896	32.28	6.68	10.60	21.03	97.20	30.80	21.99	3.55
72	7453	2351	5088	3781	15.07	12.37	8.99	N.A.	97.20	30.80	17.05	6.10
73	3192	1536	4926	2248	26.79	42.92	9.33	22.80	N.A.	N.A.	34.68	4.86

Table F-3

PROVINCIAL MOBILITY DATA

	NFLD	PEI	NS	NB	PQ	ONT	MAN	SASK	ALB	BC
SAMPLE NET OF NO RECORD	5485	915	9859	7346	82861	115614	12825	8139	15940	28970
FULL TIME INCOME	4612	3738	4407	4360	4801	5287	4675	4681	4988	5630
AVERAGE INCOME	2909	2199	2999	2806	3521	3899	3405	3239	3491	4028
TOTAL EARNED INCOME	4063	3114	3834	3818	4333	5190	4592	5055	4652	5409
PER CENT CLAIMANT	30.6	19.6	11.3	16.0	7.9	4.1	5.7	5.1	4.6	7.0
PER CENT MIGRANTS	3.51	10.53	14.70	13.31	11.63	30.97	31.34	28.15	40.84	53.30
PER CENT FRENCH SPEAKING	1.27	8.75	6.90	37.72	87.34	9.43	8.28	4.96	4.68	3.68
DISTANCE										
NFLD	---	950	968	1122	1680	2028	3159	3591	3995	4723
PEI		---	174	224	784	1130	2261	2693	3097	3825
NS			---	278	838	1184	2313	2747	3161	3879
NB				---	625	971	2102	2534	2938	3666
PQ					---	346	1477	1909	2313	3041
ONT						---	1283	1715	2119	2847
MAN							---	432	836	1564
SASK								---	404	1175
ALB									---	787
BC										---

The years of GED and SVP schooling were originally estimated by the U.S. Department of Labor, Bureau of Employment Security, U.S. Employment Service, in a publication called *Estimates of Worker Trait Requirements for 4,000 Jobs*. These data were adapted for use with the Canadian three-digit occupational classification by Bruce W. Wilkinson in *Studies in the Economics of Education*, Occasional Paper No. 4, Canada Department of Labour, Ottawa, 1965. The author wishes to express his gratitude to Mr. Wilkinson for making this information available to him.

Two special variables were used in the industrial section -- percentage of employees in a union, and percentage with a pension plan. This information is available in Report No. 10 of the Economics and Research Branch of the Canada Department of Labour, called *Working Conditions in Canada*. In some cases, the description of the industries in this report did not exactly match that of the condensed classification and, in a few instances, there was simply no correspondence; these cases are marked N.A. in Tables F-1 and F-2.

Three variables were used exclusively in the provincial mobility study: percentage of migrants; percentage of French-speaking; and distance. The percentage of migrants is the proportion of a province's population in the *1961 Census of Canada* born outside of the province. The percentage of French-speaking is the proportion of a province's population in the *1961 Census of Canada* who spoke only French or both French and English. The distance variable is a measure of the number of miles between the centres of population of all provinces. This information was obtained from the Canadian Automobile Association.

APPENDIX G

THE DUMMY VARIABLE USED IN THE INDUSTRIAL MOBILITY REGRESSIONS[1]

The purpose of the similarity dummy (*SD*) variable is to capture, in a very rough and ready manner, certain similarities in work environments in different industries. We would expect that the cost of movement is less between "similar" industries and that the mobility flow would therefore be larger. The *SD* variable is constructed on the basis of three similarity aspects: product, location, and type of work. These are examined in turn, followed by a discussion of how the three parts are put together into one dummy variable.

Product Similarity

The first task is to allocate our condensed industries into product groups. For this, we use an exhaustive 11-way classification of broad groups. Table G-1 shows how our condensed industries are allocated to the 11 groups; we use only 69 industries, since industries 46, 66, 69, and 73 are left out of the relevant empirical work in Chapter 7.

Table G-1

PRODUCT GROUPS

	Condensed Industries (See Appendix A)
a - Food and other agricultural products	1, 3, 6-11, 13
b - Wood products	2, 18-22
c - Metal products	4, 24-28
d - Nonmetallic minerals	5, 35, 36
e - Textiles	14-17
f - Other manufacturing	12, 23, 29-34, 37, 38
g - Construction	39-41
h - Transport and communication services	42-45, 47, 48
i - Sales services	50-59
j - Personal services	60-65, 67, 68, 70
k - Government services	49, 71, 72

[1] I am particularly grateful to Frank Claydon for construction of the *SD* variable.

Most of the groupings are self-evident and the allocations self-explanatory. The product group "other manufacturing" represents a rather diverse collection of products, but this is not easily avoidable.

But industries have product links that are not captured by a classification such as in Table G-1. Table G-2 presents these secondary product links organized along the lines of the product groups used in G-1. Most of the links are in the nature of input-output links; e.g., in the first group we have "storage" industry 47 because it includes storage of agriculture products, wholesaling industries 50 and 51 because of agricultural and food products that are sold through wholesale firms, and "food stores" industry 53, which retails food products.

Table G-2

SECONDARY PRODUCT LINKS

	Condensed Industries
a - Food and other agricultural products	47, 50, 51, 53
b - Wood products	39-41, 50-52
c - Metal products	29-34, 39-41, 49, 52
d - Nonmetallic minerals	37, 39-41, 50, 56
e - Textiles	1, 12, 13, 51, 57
f - Other manufacturing	28, 36, 49, 51, 52, 56, 58
g - Construction	19, 28, 35, 71, 72
h - Transport and communication services	23, 31-34, 68
i - Sales services	1, 6-13, 17, 19-23, 28-38, 60, 61, 64, 65, 67, 68
j - Personal services	42-44, 48, 53-59, 71, 72
k - Government services	39-41

It will be realized that the designation of secondary links is an even more arbitrary exercise than the product grouping. This problem is unavoidable and perhaps not too serious since our final *SD* variable is only a rough summary of the three similarity aspects. In any case, by showing exactly the nature of our classifications, we allow others to improve on this type of effort.

Location Similarity

Table G-3 shows a two-way grouping of industries in terms of the location of the work activity: inside work

and urban location, or outside work and rural location. In mixed cases, we have allocated industries according to the aspect that was thought to be predominant.

Table G-3

LOCATION SIMILARITY

	Condensed Industries
Inside, urban	6-17, 19-38, 47-65, 67, 68, 70-72
Outside, rural	1-5, 18, 39-45

Work Similarity

Table G-4 indicates a two-way division of industries in terms of the type of work: light (including mental activity), and heavy (including many manual jobs).

Table G-4

WORK SIMILARITY

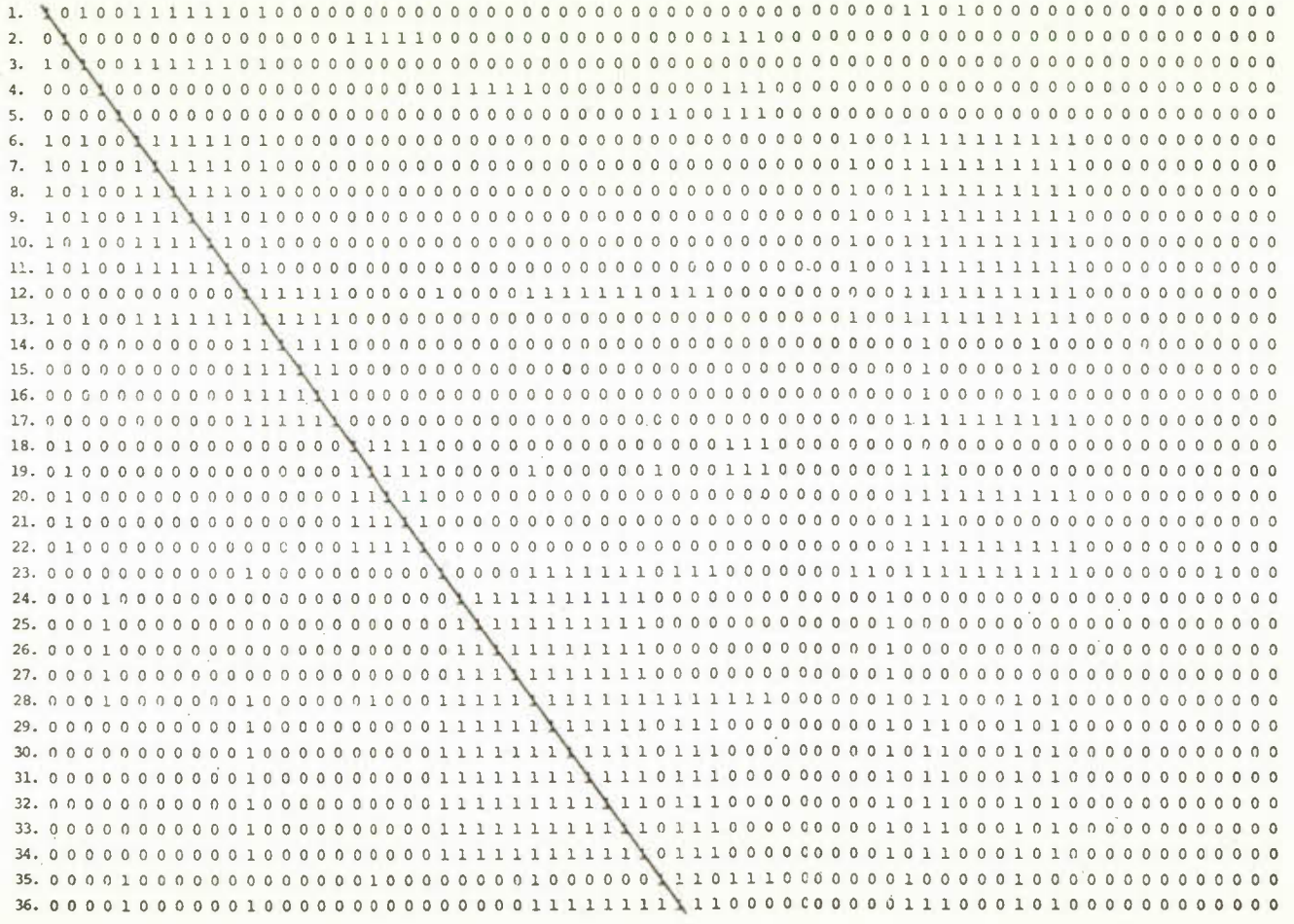
	Condensed Industries
Light	6-17, 20, 22, 23, 38, 42, 47, 48, 50-65, 67, 68, 70-72
Heavy	1-5, 18, 19, 21, 24-37, 39-41, 43-45, 49

The Similarity Dummy (*SD*)

In putting things together, different weights were attached to the various similarity tables. Weights range from 4 to 1 in order of importance but also in line with the degree of confidence that we have in the various groupings. Appearances in Table G-1 are assigned 4; in Tables G-1 and G-2, 2; and in Tables G-3 and G-4, 1. Thus if two industries appear in the same product group -- e.g., industries 1 and 6 -- then cells 1-6 and 6-1 are assigned 4. If two industries have secondary product links in the same product group -- e.g., industries 6 and 53 -- then cells 6-53 and 53-6 are assigned 2. Finally, if two industries are in the same group in Tables G-3 or G-4, the appropriate cells are assigned 1.

Table G-5

THE *SD* VARIABLE IN MATRIX FORM



(cont'd.)

Table G-5 (concl'd.)

Now *SD* = 1 when the sum of the numbers assigned to a cell is 4 or more, and *SD* = 0 otherwise. It will be realized that if two industries are in the same primary product group, then *SD* = 1; if they are not in the same primary product group, *SD* will be unity only if the two industries have secondary product links and appear in the same groups in Tables G-3 and G-4. The final dummy *SD* is reported in Table G-5 in matrix form; the matrix is symmetrical.

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LIST OF TABLES

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