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1. Introduction

A society is usually characterized as 'open' or 'closed' depending on the scope for mobility for every member of its population. Social mobility is a complex phenomenon constituted of a variety of interdependent factors. Occupational mobility is considered, by and large, as a first approximation of social mobility. In view of this practice, the present paper confines its attention to occupational mobility alone.

Various studies on occupational mobility in the western countries have been reviewed by Lipset and Bendix (1962). One of the generalizations arrived at by these authors is that the industrialized nations of the West are marked by a high degree of mobility as measured by the shift across the manual-non manual line and furthermore, there is relatively little difference in rates of mobility. It is also shown that the mobility patterns in western industrialized societies are determined by the occupational structure. A recent study on the United States by Blau and Duncan (1967) tries to look at the various determinants of mobility with data gathered at the time of 1960 Census. As far as Canada is concerned, there has been a dearth of studies in this area. Porter (1965) in his classic work The Vertical Mosaic analyzes occupational mobility in Canada as could be inferred from the data provided by the censuses.

We might conclude that although there has been a transferring of workers from manual to non-manual occupations, it is questionable that all of this shift represents upward mobility from "lower-level" manual occupations. It seems that these lower white collar occupations have been filled more by the native labor force than by immigrants and that the shift has provided, at best, a questionable mobility for the native born.

(Porter, p. 52)

Elsewhere the author writes: At each period of industrial growth, as new opportunities for upward mobility appear, each increment of skilled and professional roles is filled in part by immigration, in part by the Canadian-trained, and in part by upgrading. The same sources must replace those who leave the labour force for various reasons. There obviously has been some mobility for Canadian industrial workers, but there is little doubt that there could have been much more

(Porter, p. 56) Because of lack of sophistication in his methodology, Porter is not able to provide the readers with an estimate of the degree of mobility in the Canadian Society. This paper is directed toward that end by employing a stochastic process analysis of the mobility process.

Mobility as a Stochastic Process 2. Various attempts have been made in the last two decades at stochastic process modelling of mobility (Blumen, Kogan, and McCarthy, 1955; Joshi, 1956; Kemney and Snell, 1960, Hodge, 1966).

An overview of the work done so far can be found in Bartholomew (1973). Since finite Markov chain approximation of the mobility process was not satisfactory, McGinnis (1968) re-examined the substantive basis of the models and has suggested the incorporation of the principle of cumulative inertia. Verification of this principle has been done in Land (1969), Morrison (1967) and Myers, McGinnis, and Masnick (1967). Models of social mobility incorporating this principle have been discussed by Henry, McGinnis, and Tegetmeyer (1972) and McGinnis and Henry (1973). Recently a semi-Markov approximation of the mobility process has been suggested (Ginsberg, 1972).

One has to collect very detailed data in order to test the goodness of fit of the above modified models. Very often we cannot do it for economic or for administration reasons. Insofar as one has to work with non-panel data, it is feasible to develop only simple models.

Stochastic Indicators of Occupational Mobility 3. Consider S. (i = 1, 1,2...h) - the non-over-lapping occupational categories - to constitute the state space. Let the mobility process be a Markov process in discrete time. If stationarity of the process is assumed, then the model is easy to handle. The stationarity assumption may be easily relaxed, if deemed necessary. Let P = (Pi) be the matrix of transition probabilities. The elements of P are the stochastic indicators of occupational mobility. The major problem with which we are faced is the estimation of these probabilities when panel data are not available and one has access to only marginal distributions (macro data).

Estimation Procedure of the Stochastic 4. Indicators

Since only macro data from the censuses are available, we are forced to make a few assumptions. The Miller OLS procedure (1952) leads to inadmissible estimators of transition probabilities. A way out is to impose constraints on parameters. These are:

a) non-negativity condition

$$Pi_{\mathcal{A}} \ge 0$$
 $(i, \mathcal{A} = 1, 2...h)$

b) row condition

Pi
$$d = 1$$
 (i = 1,2...h)

d = The criterion of minimization employed leads to two different types of estimators. If the criterion is minimizing the sum of absolute deviations (MAD), we get a Linear Programming Problem (LPP) estimator of the transition matrix (Rogers, 1968; Lee, Judge and Zellner, 1970). If the restricted least squares (RLS) technique is employed, we obtain the Quadratic Programming Problem (QPP) estimator (Lee, Judge, and Zellner, 1970). The QPP estimator is shown to be more efficient than the LPP solution (Lee, Judge and Zellner, 1970). In this paper we employed the LPP solution only for developing estimates of occupational mobility indicators for Canada.

Usually the marginal distributions utilized in estimation procedures are temporal in nature.

We do not have enough time series data on occupational distributions in Canada and, furthermore if the available data are put to use, the stationarity assumption is likely to be violated, for the occupational change patterns before and after 1951 are, for certain, not the same. So we have used the cross-section data on the regions for the census years 1951 and 1961 for estimation purposes. The rationale underlying this manipulation is that the different provinces reflect the occupational transitions in Canada over a period of time with the transitions governed by the same rule.

5. Data and Findings

The percent distributions by occupational categories, suitably collapsed, employed for this exercise are shown in Appendix Tables 1 and 2. The male and female distributions are treated separately. The estimated ten-year transition probabilities are shown in Tables 1 and 2. In each case the functional values are the minimum possible as the programming technique is employed.

6. Male Mobility Patterns

Now we interpret the results from a substantive point of view. As far as males are concerned, the greatest movement is noticed in the primary sectior. While 67 per cent of the workers in the agriculture sector continue to stick to this occupation, 33 per cent move to other jobs in this ten-year period. Blue collar sector accounts for 14 per cent of the movement, white collar jobs 9 per cent, transportation sector 6 per cent and the remaining 4 per cent to service and recreation occupations. The least movement (about 9 per cent) is noticeable in the White Collar sector. It is surprising to note that most of the movement from this group is to the primary group. This may be due to combining "not stated" category with primary occupations. From the transport and communications group, the movement of 29 per cent is to blue-collar jobs. 14 per cent of the blue collar workers move to white collar jobs and 3 per cent to the transport and communications sector. The service and recreation occupations sector seems to force everybody to stick to itself.

Thus, as far as males are concerned, the 1951-1961 period noticed an average movement of 17.6 per cent of workers from their 1951 occupational categories. (If the service and recreation sector is ignored, the average movement works out as 22.0 per cent). If movements to white collar jobs and/or staying up there is taken to indicate "upward mobility", of the males in Canada 22.8 per cent experience upward mobility in this span.

7. Female Mobility Patterns

The mobility patterns of the Canadian females are more interesting. The movement out of the primary sector is indeed small (about 2 per cent). The movement out of service and recreation occupations is considerable (about 50 per cent) and most of this transition is to white collar jobs (32 per cent). The black to white collar change is 12 per cent (almost as high as that of males). But surprisingly enough, 20 per cent of the white collar job workers move out (down), mostly to service and recreation occupations (18 per cent). No female sticks to 'transport and communication' sector.

An overall average extent of mobility is 40.2 per cent in the ten-year span. Taking upward mobility as indicated by moving to white collar jobs and/or staying up there, on an average 37.8 per cent of the Canadian females were upwardly mobile in the ten-year span.

Thus, we are led to conclude that the females are generally more mobile and particularly more upwardly mobile in Canada in 1951-61.

8. Conclusions

This study has revealed that in 1951-61, the Canadian females have higher rates of mobility than the males. Since the earlier periods have not been studied, it is difficult to say whether the mobility has increased over time or not. But it could be said that the period 1961-71 and in the future too, female mobility is likely to increase in view of the women's rights movements and associated activities.

It has not been possible for us to study the mobility patterns in different provinces, between major urban concentrations, and between immigrants and non-immigrants. To gain such an understanding of the Canadian society, more research in this area is called for. This may help understand the society better and pave the way for major policy decisions.

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TABLE 1

Transition Probability Matrix

	<u> 1951 -</u>	1951 - 1961 Canada Occupations Males							
	(1)	(2)	(3)	(4)	(5)				
(1)	0.91255	0.00000	0.00572	0.03170	0.05003				
(2)	0.14057	0.83446	0.02497	0.00000	0.00000				
(3)	0.00000	0.29143	0.70857	0.00000	0.00000				
(4)	0.00000	0.00000	0.00000	1.00000	0.00000				
(5)	0.08797	0.13946	0.05850	0.04093	0.67313				

- Legend: (1) = White Collar Workers
 - (2) = Blue Collar Workers
 - (3) = Transportation and Communication Occupations
 - (4) = Service and Recreation Occupations
 - (5) = Primary Occupations

TABLE 2

Transition Probability Matrix

	<u> 1951 -</u>	1961 Canada	Occupations	Females	
	(1)	(2)	(3)	(4)	(5)
(1)	0.79677	0.00000	0.02459	0.17864	0.00000
(2)	0.12344	0.71053	0.00372	0.09322	0.06909
(3)	0.53658	0.13029	0.00000	0.16060	0.17253
(4)	0.42930	0.00000	0.03261	0.50229	0.03580
(5)	0.00000	0.00000	0.02055	0.00000	0.97945

Legend: (1) = White Collar Workers

- (2) = Blue Collar Workers
- (3) = Transportation and Communication Occupations
- (4) = Service and Recreation Occupations
- (5) = Primary Occupations

APPENDIX

Table 1

Percentage Distribution of the Labour Force 15 Years of Age and

Over for Canada and Regions - Males										5						
Occupation Division		Canada		New Foundland		Marit Provi	Maritime Provinces		Quebec		Ontario		Prairie Provinces		British Columbia	
		1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	
(1)	White Collar Workers	25.3	30.3	16,8	23.1	19.2	21.4	25.8	30.9	28.4	33.0	21.7	26.6	27.0	31.6	
(2)	Blue Collar Workers	35.1	35.0	31.3	36.2	30.8	32.6	38.0	37.7	40.3	37.6	22.2	25.8	37.9	37.3	
(3)	Transport and Communcation Occupations	7.2	7.5	8.2	9.6	8.3	8.2	7.5	8.2	7.1	7.2	6.0	6.5	8.4	8.1	
(4)	Service and Recreation Occupations	6.5	8.5	5.4	7.5	7.7	13.0	5.8	7.5	7.0	8.6	5.4	7.5	8.7	9.7	
(5)	Primary Occupations	24.6	16.0	37.2	20.0	32.5	19.8	21.0	12.7	16.1	11.1	44.0	31.3	16.5	10.4	
(6)	Occupation Not Stated	1.3	2.7	1.1	3.5	1.5	2.1	1.9	3.0	1.0	2.5	0.6	2.3	1.4	3.0	

Source: 1961 Census of Canada, Labour Force, Table 7 Note: Category (5) in the text is found by combining (5) and (6) of these tables

APPENDIX

Table 2

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Percentage Distribution of the Labour Force, 15 Years of Age and

Occupation Division		Canada		New Foundland		Marit Provi	Maritime Provinces		Quebec		Ontario		Prairie Provinces		British Columbia	
		1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	1951	1961	
(1)	White Collar Workers	54.1	55.9	56.4	61.9	55.4	57.9	47.4	51.1	56.4	58.0	55.9	54.2	61.0	61.8	
(2)	Blue Collar Workers	18.1	12.8	7.1	4.8	10.2	8.5	26.2	19.4	19.8	13.5	8.2	6.0	9.1	7.0	
(3)	Transport and Communication Occupations	2.8	2.2	2.1	2.1	2.6	2.4	2.5	2.0	3.0	2.1	2.5	2.4	4.1	2.3	
(4)	Service and Recreation Occupations	21.1	22.4	32.9	27.6	28.9	27.2	20.4	21.1	17.6	21.3	25.6	24.0	23.0	23.8	
(5)	Primary Occupations	2.8	4.3	0.8	0.4	1.4	1.6	2.2	3.2	2.1	3.3	7.0	10.9	1.7	2.0	
(6)	Occupation Not Stated	1.1	2.4	0.7	3.1	1.4	2.3	1.3	3.2	1.1	1.8	0.8	2.5	1.2	3.0	

Over For Canada and Regions - Females

Source: 1961 Census of Canada, Labour Force, Table 7

Note: Category (5) in the text is found by combining (5) and (6) of these tables