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EFFECTS OF PERSONAL FACTORS ON THE DESTINATION CHOICE PATTERNS OF CANADIAN IMMIGRANTS: AN EVALUATION WITHIN A MULTIVARIATE FRAMEWORK †

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I. INTRODUCTION

Canada is a multicultural nation of immigrants. Immigration has profoundly influenced the social, cultural, demographic and economic fabric of the nation. The outcomes of historical waves of immigration are still largely visible within the Canadian landscape and current inflows have created nations of ex-patriots within Canadian cities.

An important spatial aspect of immigration is the immigrants' destination choice pattern. Government policies have tended to influence the composition of immigrant flows and, to an extent, the eventual destinations of the immigrants. Historically, destination choice operated in conjunctionwith economic necessity and was guided by government policy initiatives (Passaris, 1984). The shortage of skilled farmers from Western Europe to populate and farm the Prairies forced the Canadian governmnet to allow a large number of Eastern Europeans to enter the country in the early decades of the present century. The success of this policy was enhanced by the immigrants' desire to reside in a region with familiar landscape and occupation.

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The re-alignment of immigration policy from racially motivated and exclusionary types towards economically oriented ones permitted increased flows from non-traditional source countries—southern Europeans in the 1950s and early 1960s and then Asians after the introduction of the 'point system' in the late 1960s when applicants with better education and desirable skills were given a higher priority. This re-alignment of policy, together with rapid urbanization, was accompanied by a shift in the destination choice pattern of immigrants—from rural areas to urban places where the better educated immigrants sought employment in the expanding secondary and tertiary industries (Basavarajappa and Verma, 1985; Moore, Ray and Rosenberg, 1990).

After entering Canada, the immigrants continued to relocate. It was shown in Liaw (1988 and 1990) and Liaw and Ledent (1988) that the interprovinacial migration propensity of foreign-born Canadians in 1976-81 was moderately higher than that of the 'natives' (those who were living in their province of birth) but substantially lower than that of the 'non-natives' (those whose province of residence was different from province of birth). Relative to their native and non-native counterparts, the foreign-born young adult migrants were also found to be more likely to choose Ontraio (if the origin was Quebec or the Atlantic provinces) and British Columbia (if the origin was one of the three Prairie provinces) as the destinations(1). Furthermore, the sensitivities of these foreign-born migrants to the effects of the economic variables at destinations (wage, employment growth and unemployment) were similar to those of their native counterparts but significantly stronger than those of the corresponding non-native migrants (Liaw, 1990).

Different ethnic groups may also display dissimilar propensities to re-locate, either at the inter- or intra-provincial level. Trovato and Halli (1990) noted that individuals of British, Ukrainian and "Other" origins were more likely to make an inter-porvincial move. Ethnic groups with lower tendencies to make an inter-provincial migration, such as the Italians and the Jewish, may have a stronger dependence on the local communities and/or stronger kinship ties and consequently would be more likely to locate within the same area (Trovato and Halli, 1990). Ultimately, the existence of large ethnic communities serve as strong 'pulls' by aiding the economic and social integration of new arrivals (Kobrin and Speare, 1983; Trovato, 1988).

The continued relocations of the immigrants within Canada can be considered as a process in which relatively stable patterns of residence are gradually established as a conse-

(1)Atlantic provinces include Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick, whereas the Prairie provinces include Manitoba, Saskatchewan and Alberta.

quence of the increases in their financial resources and in their knowledge of the conditions and opportunities in different parts of Canada. As a reflection of the true locational preferences, these patterns of residence are in our opinion more meaningful than those revealed at the time of immigration and hence deserve careful analysis. For most immigrants (i.e. except for the most recent immigrants), these relatively stable patterns of locational preferences are revealed in the population censuses of Canada simply by the current place of residence. Therefore, we may call the destination choice patterns revealed by a census as the established patterns. In contrast, we may call the patterns revealed by the annual immigration statistics as the initial patterns. In the remaining parts of this paper, the destination choice patterns are understood to be the established ones.(2)

The destination choice patterns of the immigrants may affect not only the relative demographic weights of different regions but also the cultural mix (or polarization) and the spatial pattern of human capital in Canada, if they vary with personal factors. For example, the avoidance of Quebec by most non-French immigrants may aggravate the English/French polarization. If better educated immigrants tend to have a stronger propensity to select economically better developed regions, then immigration may also aggravate the economic disparities among regions by increasing the labour productivity of the already highly productive regions. Therefore, it is important to study the effects of personal factors on the established destination choice patterns of the immigrants.

If the personal factors are independent of each other, their effects on the desination choice patterns can be effectively studied by using contingency tables. However, if some factors are dependent to some extent (e.g. education and income) or can produce interaction effects, a comprehensive understanding of the effects of personal factors on the immigrants' destination choice patterns can not be easily accomplished without a more abstract multivariate approach such as the use of a polytomous logit model.

The purpose of this paper is to study the effects of personal factors on the established destination choice patterns of Canadian immigrants in 1981 within a multivariate context, using the micro data in the Public Use Sample (PUS) of the 1981 Canadian population census.

Six personal attributes encompassing ethnic origin, level of education, occupation, class

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(2)Since the census data file does not contain the information on the place-of-residence at the time of immigration, we are unable to study how the established patterns evolved from the initial distribution. To the best of our knowledge, the data for such a study do not exist.

of work, income and period of immigration are to be used. Ethnic origin is selected be cause it is an intersting cultural factor which is related to the federal policies of bilingualism and multiculturalism.(3) The level of education is selected, because it is a proxy of the quality of human capital. Occupation, class of work and income are chosen as indicators of the basic labour-market attributes of the immigrants. Finally, the period of immigration is used to control for the shift towards more urbanized regions after World War Two when most of the prime farmlands in western Canada had been settled.

The destinations are defined as the ten provinces; the largest nine provinces and an artifical 'province' consisting of Prince Edward Island (the smallest province), Yukon and Northwest Territories. The artificial province, to be called PEIT for simplicity, is used because the smallest province and the two territories have been given the same code by Statistics Canada in creating the micro data file.

A polytomous logit model is to be used to evaluate the relative importance of the personal factors on the destination choice patterns and to see whether the effects of some factors are highly redundant or not. Since several personal factors are shown in the PUS with too many detailed distinctions to allow an effective application of the logit model, cluster analysis is first used to reduce the number of distinctions in each of these factors, except for the period of immigration.(4) For example, the 22 distinctions in ethnic orgin (including Greek, Croatian, Chinese, etc.) are reduced by cluster analysis by merging several distinctions into one, according to the similarities in the destination choice patterns. Such an objective method of merging ethnic groups is better than the grouping by the region of origins, because, for example, the destination choice pattern of the Dutch is more similar to that of the Chinese than that of the French.(5)

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(3)Alternative measures of ethnicity include mother tongue and birthplace. Realistically, no one variable is perfect in measuring an immigrant's true cultural affinity. However, in the authors' opinion, ethnic origin was the most interesting as it most concisely illustrates the dominant cultural groups within Canada.

(4)We emphasize that if more computer memory becomes available, the logit model can be, applied directly, and that the cluster analysis does not tend to inflate the explanatory power of the ethnic factor relative to other factors like occupation and education in the logit model because it is applied to all factors except for the period of immigration.

(5)When one of the authors was doing research in the Netherlands and mentioned this similarity between the Dutch and the Chinese, a Dutch friend responded immediately that he was not surprised by this finding, because in Europe the nickname for the Dutch is "the Chinese of Europe". Both peoples are good at running small businesses and tend to select destinations where such businesses have a better channce to succeed.

The paper is structured as follows. Section 2 describes the overall destination choice pattern and provides a partial view of the destination choice patterns for all detailed distinctions in the most interesting personal factor, namely ethnic origin. Section 3 shows the application of cluster analysis. Section 4 specifies the logit model and the related statistics. Section 5 presents the estimation results of the logit model. Finally, section 6 offers a concluding discussion.

II. THE OVERALL DESTINATION CHOICE PATTERN AND THOSE OF DIFFERENT ETHNIC GROUPS

Let P[j] be the proportion of all immigrants that was found to reside in province j on the date (June 3) of the 1981 census. The set of P[j] across all provinces describes the overall destination choice pattern of the immigrants. The dispersion of this pattern is measured by the entropy

$$E = -\sum_{j=1}^{10} p[j]^* \ln\{p[j]\} / \ln\{2\} \qquad (1)$$

where ln is the natural logarithm, and the summation is across all 10 destinations. The entropy can assume a maximum of 3.32 (if the immigrants are equally distributed) and a minimum of zero (if all immigrants are concentrated in only one province).

To describe the destination choice pattern of the immigrants of a given ethnic group g, we let P[j,g] be the proportion of these immigrants that was found to reside in province j on the census date. The entropy of this pattern is defined according to equation (1) by substituting P[j] by P[j,g].

To suggest the effects of the destination choice patterns of the immigrants on the population shares of different provinces, we also compute the entropy of the population distribution and define the 'fair share' of immigrants by a province as the share equal to its population share.

Since there are as many as 76,666 immigrants in the 1981 PUS, the values computed for the above measures are likely to be highly reliable. We see from the entropies in the last two rows of Table 1 (2.04 versus 2.58) that the overall destination choice pattern of the immigrants is much more concentrated than the population distribution. Two provinces have much more than their fair shares of immigrants:Ontario (52.5% versus 35.4%) and British

Columbia (16.4% versus 11.3%). The attraction of Ontario is particularly impressive: more than half of the immigrants have ultimately located themselves in Ontario. To a lesser extent, Alberta also has more than its fair share of immigrants (9.5% versus 9.2%). The remaining seven provinces all have received substantially less than their fair share of immigrants : Quebec, Manitoba and Saskatchewan have received about half of their fair shares, whereas the Atlantic provinces have received less than one-third of their fair shares. The strong concentration of the immigrants towards the regions with a strong economic base (Ontario) and an attractive physical environment (British Columbia) appears to be quite clear.

Table 1: Overall Destination Choice Patterns of Immigrans by Ethnic Group

Ethnic Origin	NFLD	PEI	NS	NB	QUE	ONT	MTB	SASk	ALTA	BC	TOTAL	ENTROPY
	(percent)										(perosn)	(bit)
German	0.1	0.2	0.7	0.3	6.0	43.9	8.1	5.0	14.9	20.8	5468	2.26
Dutch	0.1	0.5	1.3	0.5	2.2	54.8	3.8	1.8	15.8	19.2	3010	1.93
Chinese	0.3	0.3	0.5	0.5	6.2	42.0	2.6	2.2	12.5	33.1	4240	2.06
Czechoslovakian	0.0	0.1	0.4	0.0	11.0	53.0	4.7	2.0	11.7	17.0	707	1.99
Hungarian	0.0	0.3	0.7	0.2	11.2	57.5	2.2	3.2	11.5	13.2	1206	1.93
Polish	0.1	0.1	0.4	0.2	11.2	61.0	6.6	3.4	9.6	7.5	1930	1.89
Croatian	0.1	0.1	0.2	0.3	6.3	70.5	2.2	0.5	7.6	12.2	1497	1.48
British	0.5	0.4	1.9	1.2	6.1	54.1	3.3	2.2	9.9	20.3	23199	2.06
Greek	0.0	0.0	1.0	0.3	32.9	56.1	1.4	0.8	2.3	5.2	1831	1.58
Italian	0.1	0.0	0.2	0.1	22.3	66.6	1.3	0.3	3.2	6.0	7886	1.42
Portuguese	0.1	0.0	0.2	0.1	14.3	69.5	4.1	0.3	3.1	8.2	2730	1.47
Jewish	0.2	0.0	0.8	0.2	36.9	49.1	4.2	0.3	3.9	4.5	1854	1.73
African	0.1	0.0	0.5	0.1	18.9	65.0	2.9	1.1	7.1	4.3	2138	1.60
French	0.2	0.2	1.2	3.3	69.3	13.8	1.6	0.8	3.6	6.0	2331	1.60
French and other	0.0	0.0	1.0	0.5	50.5	25.9	2.9	0.5	5.2	10.0	210	1.86
Scandinavian	0.3	0.6	0.9	0.7	2.5	22.7	6.0	10.2	21.0	35.2	1205	2.38
Ukrainian	0.0	0.0	0.2	0.0	7.5	44.2	14.2	8.4	17.5	8.1	1495	2.25
OSR	0.2	0.2	0.7	0.4	15.9	44.9	4.2	1.4	9.9	17.2	12081	2.09
British and French	1.4	0.9	3.7	2.8	22.8	39.1	1.9	1.9	6.0	19.5	215	2.40
British and Other	0.3	0.3	2.5	1.3	7.8	45.5	2.9	2.7	12.3	24.3	1166	2.23
British, French, Other	1.4	1.4	1.4	3.4	11.0	38.6	2.1	2.8	16.6	21.4	145	2.47
OMR	0.0	0.8	0.0	0.0	20.5	47.5	7.4	0.0	13.1	10.7	122	2.04
Overall	0.2	0.2	1.0	0.7	13.6	52.2	2.8	2.1	9.5	16.4	76666	2.04
Population Dist.	2.3	0.8	3.5	2.7	26.4	35.4	4.2	4.0	9.2	11.3	100	2.58

NOTE:All values shown are percentages, except for TOTAL column which is persons.
OSR=Other Single Responses.
OMR=Other Multiple Responses.

The destination choice patterns of the immigrants vary substantially among the 22 ethnic groups. The Germans, Dutch and Chinese display higher than average propensities to choose British Columbia and Alberta, although they are similar to most other groups in choosing Ontario as the most preferred destination. In contrast, Eastern European (including Czechoslovakian, Hungarian, Polish and Croatian) and Brititsh ethnic groups have overwhelmingly chosen Ontario as their most preferred destination, with Alberta and British Columbia being the second choices.

The Southern European (including Greek, Italian and Portuguese), Jewish and African groups share the following common property. In addition to picking Ontario as the first choice, they select Quebec as their clear second choice. Actually, Quebec has attracted more than its fair share of Jewish (36.9%) and Greek (32.9%) immigrants.

The immigrants of French and French-and-Other ethnic groups show a disproportionately strong preference for the French-speaking province of Quebec and are two of the only three groups whose most preferred destination is not Ontario. New Brunswick with about one-third of its population being French received more than its fair share of immigrants only in the French group (3.3%).

Scandinavian immigrants, relative to all other gropus, display the strongest preferences for British Columbia (35.2%), Alberta (21.0%) and Saskatchewan (10.2%) and provide Ontario with less than its fair share of immigrants (22.7%). Ukrainian immigrants, relative to other groups, display very strong preferences for the three Prairie provinces : Manitoba (14.2%) , Saskatchewan (8.4%) and Alberta (17.5%), although their most preferred destination is clearly Ontario (44.2%).

The ethnic variation in destination choice patterns, together with the ethnic variation in immigrant volumes, helps determine the interprovincial variation in the ethnic composition of the immigrants (Table 2). The British ethnic gorup, representing 30.3% of all immigrants in Canada, is the largest group in every province, except for Quebec where it represents 13.7% of immigrants. It is strongly over-represented in the Atlantic provinces : more than 50% of all immigrants in Newfoundland, Nova Scotia and New Brunswick belong to the British group. Ignoring the Other Single Response (OSR) group which has a combined share of 15.8% of all immigrants, Italians are the second largest immigrant group in Canada (10.3%). Paradoxically, Italians are the largest immigrant group in the French-speaking province of Quebec; their share of the immigrants in the province (16.9%) is only slightly smaller than the combined share of the French, French-and-Other, British-and-French, and

British-French-and-Other groups (15.5+1.0+0.5+0.2=17.2%). Germans are the third largest ethnic group, representing 7.1% of all immigrants in Canada, and are over-represented in the four western provinces (Manitoba, Saskatchewan, Alberta and British Columbia). Finally, the fact that the share of the total immigrants by Chinese (5.5%) is higher than the corresponding shares by the Dutch (3.9) and French (3.0) is a reflection of the drastic increase of Asian immigrants since the late 1960s.

Table 2: The Ethnic Compositions of the Immigrants in Canada and Different Provinces

Ethnic Origin	NFLD	PEI	NS	NB	QUE	ONT	MTB	SASk	ALTA	BC	TOTAL
					(percent)						
German	2.6	5.0	4.5	3.6	3.1	6.0	15.2	17.0	11.3	9.1	7.1
Dutch	1.6	7.7	5.0	3.1	0.6	4.1	3.9	3.3	6.6	4.6	3.9
Chinese	5.8	6.1	2.6	4.0	2.5	4.4	3.7	5.7	7.3	11.2	5.5
Czechoslovakian	0.0	0.6	0.4	0.0	0.7	0.9	1.1	0.9	1.1	1.0	0.9
Hungarian	0.0	2.2	1.0	0.4	1.3	1.7	0.9	2.4	1.9	1.3	1.6
Polish	0.5	1.1	1.0	0.6	2.1	2.9	4.4	4.0	2.6	1.1	2.5
Croatian	0.5	0.6	0.4	0.8	0.9	2.6	1.1	0.5	1.6	1.5	2.0
British	60.5	48.6	55.6	53.9	13.7	31.2	26.2	31.8	31.8	37.5	30.3
Greek	0.0	0.0	2.3	1.0	5.8	2.6	0.9	0.9	0.6	0.8	2.4
Italian	2.1	1.1	1.5	1.2	16.9	13.1	3.4	1.6	3.5	3.7	10.3
Portuguese	1.6	0.6	0.6	0.6	3.8	4.7	3.9	0.5	1.2	1.8	3.6
Jewish	1.6	0.0	1.8	0.8	6.6	2.3	2.6	0.4	1.0	0.7	2.4
African	1.6	0.6	1.3	0.4	3.9	3.5	2.1	1.5	2.1	0.7	2.8
French	2.6	2.8	3.7	14.6	15.5	0.8	1.3	1.1	1.1	1.1	3.0
French and other	0.0	0.0	0.3	0.2	1.0	0.2	0.2	0.1	0.2	0.2	0.3
Scandinavian	2.1	3.9	1.4	1.5	0.3	0.7	2.5	7.6	2.5	3.4	1.6
Ukrainian	0.0	0.0	0.4	0.0	1.1	1.6	7.3	7.7	3.6	1.0	2.0
OSR	12.1	14.4	11.3	8.4	18.4	15.0	17.5	10.6	16.4	16.5	15.8
British and French	1.6	1.1	1.0	1.2	0.5	0.2	0.1	0.2	0.2	0.3	0.3
British and Other	2.1	2.2	3.7	2.9	0.9	1.3	1.2	2.0	2.0	2.3	1.5
British, French, Other	1.1	1.1	0.3	1.0	0.2	0.1	0.1	0.2	0.3	0.2	0.2
OMR	0.0	0.6	0.0	0.0	0.2	0.1	0.3	0.0	0.2	0.1	0.2
Total(perosns)	190	181	793	521	10409	40236	2907	1618	7249	12562	76666
Entropy(bits)	2.30	2.73	2.61	2.51	3.49	3.37	3.41	3.23	3.30	3.08	3.48

NOTE: OSR=Other Single Responses.
OMR=Other Multiple Responses.
The theoretical maximum of the entropy for 22 ethnic groups is 4.46 bits.

The entropies at the bottom of Table 2 show that the ethnic diversity of the immigrants varies substantially among the provinces. The diversity is grestest in Quebec (3.49) despite the overwhelming French dominance of its population, and least in the Atlantic provinces (about 2.50). The influx of foreign-speaking immigrants works to dilute, albeit marginally, the increasing polarization of the French and English speaking populations in Quebec (Health and Welfare Canada, 1989).

III. CLUSTER ANALYSIS

We choose to base the cluster analysis on the dissimilarity index between destination choice patterns of each pair of distinctions with respect to a given personal factor. We will describe the procedure in detail for the ethnic factor and then report only the results for other factors.

The dissimilarity index between the destination choice patterns of two ethnic groups f and g, say French and German, is defined as

$$D[f,g] = \sum_{j=1}^{10} | P[j,f] - P[j,g] | /2*100 \qquad (2)$$

where P[j,f] and P[j,g] are respectively the proportions of the immigrants in gropus f and g choosing province j as the destination. In other words, it is the percentage of the immigrants of one ethnic group that must be redistributed among the destinations in order to make the two choice patterns identical. The application of equation (2) to every pair of the 22 ethnic groups results in the dissimilarity matrix in Table 3. The values range from a minimum of 3 (between Croatian and Polish immigrants) to a maximum of 77 percent (between French and Dutch immigrants). The dissimilarity is then used as the input to the cluster analysis program of SPSSx[6] .

Cluster analysis starts by merging the two groups with the smallest dissimilarity index. The dissimilarity indices between the new cluster and the existing ethnic groups are then recalculated. Then another cluster is formed by merging the two distinctions with the smallest index. The procedure continues until all groups have been merged into one big cluster.

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(6)The dissimilarity index is mathematically equivalent to the "Manhattan" or "city-block" distance. Therefore, we use the BLOCK subcommand. We also choose the BAVERAGE subcommand, which uses the unweighted average in computing the new distance.

Table 3: The Dissimilarity Matrix of the Ethnic Groups with Respect to Their Destination Choice Patterns.

Ethnic Origin	BRI	FRE	AFR	CHI	CRO	CZE	DUT	GER	GRE	ITL	JEW	HUN	POL	POR	SCN	UKR	OSR	B&F	B&O	F&O	BFO	OMR
British	0	72	23	11	13	8	20	16	32	28	15	12	12	24	36	27	15	22	12	63	8	18
French	72	0	57	74	71	73	77	72	46	60	62	76	71	66	74	73	62	62	72	11	71	76
African	23	57	0	32	16	25	42	34	13	11	9	22	17	15	56	20	21	30	34	48	28	37
Chinese	11	74	32	0	22	12	15	11	38	37	24	21	21	32	26	34	15	25	8	64	15	17
Croatian	13	71	16	22	0	14	32	25	29	15	10	6	3	12	46	19	20	28	24	62	17	27
Czechoslovakian	8	73	25	12	14	0	30	15	32	28	18	12	13	25	38	28	17	26	14	64	9	16
Dutch	20	77	42	15	32	20	0	15	48	47	34	28	31	42	33	44	23	27	13	67	22	12
German	16	72	34	11	25	15	15	0	41	40	27	25	24	35	29	30	14	22	10	62	18	17
Greek	32	46	13	38	29	32	48	40	0	17	21	34	29	24	62	28	28	37	40	36	34	44
Italian	28	60	11	37	15	28	47	41	17	0	14	21	17	7	61	22	26	34	39	50	31	41
Jewish	15	62	9	24	10	18	34	27	21	14	0	15	11	12	48	21	14	25	26	52	19	29
Hungarian	12	76	22	21	6	12	28	25	34	21	15	0	7	16	47	23	23	31	22	66	15	21
Polish	16	71	17	21	3	13	31	24	29	17	11	7	0	14	46	19	20	27	23	62	15	27
Portuguese	24	66	15	32	12	25	42	35	24	7	12	16	14	0	56	18	24	30	34	55	27	36
Scandinavian	36	74	56	26	46	39	33	29	62	61	48	47	46	56	0	56	36	40	30	64	38	38
Ukrainian	27	73	20	34	19	28	44	30	28	22	21	23	19	18	56	0	30	40	35	62	31	37
OSR	15	62	21	15	20	17	23	14	28	26	14	23	20	24	36	30	0	17	15	52	16	17
British and French	22	62	30	25	28	26	27	22	37	34	25	31	27	30	40	40	17	0	20	55	18	27
British and Other	12	72	34	8	24	14	13	10	40	39	26	22	23	34	30	35	15	20	0	62	15	15
French and Other	63	11	48	64	62	64	67	62	36	50	52	66	62	55	64	62	52	55	62	0	62	65
British, French, Other	8	71	28	15	15	9	22	18	34	31	19	15	15	27	38	31	16	18	15	62	0	18
OMR	18	76	37	17	17	16	12	17	44	41	29	21	27	36	38	37	17	27	15	65	18	0

The clusters formed at successive steps are shown in the 'icicle' plot in Figure 1. It turns out that the Croatian, Polish, and Hungarian groups are most similar and hence were merged into one cluster after the first two steps. In contrast, the Scandinavian group, being quite different from all other group, was not merged into a cluster until the next to the last step. Of course, the French group, which is somewhat similar to the French-Other group, was not merged with the remaining groups until the final step.

Figure 1. The "Icicle" Plot Showing the Clusters of Ethnic Groups in terms of the Similarity in Destination Choice Patterns

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      (Down) step Number                    (Across) Ethnic Origin Cases

      F  F  S  U  G  P  I  J  A  B  O  D  O  G  B  C  H  P  C  B  C  B
      R  R  C  K  R  O  T  E  F  R  M  U  S  E  R  H  U  O  R  R  Z  R
      E  E  A  R  E  R  A  W  R  I  R  T  R  R  I  I  N  L  O  F  E  I
      O  N  N  A  E  T  L  I  I  T     C     M  T  N  G  I  O  A  R  C  T
      T  C  D  N  K  U  I  S  C  F     H     A  O  E  A  S  G  T  O  H  I
      H  H  N  I     G  A  H  A  R           N  T  S  R  H  E  I  T     S
            V  A     U  N     N  E              H  E  I        A  H     H
            N  N     E                          A  N  N
                     S                          N
21 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
20 XXXX  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
19 XXXX  X  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
18 XXXX  X  XXXXXXXXXXXXXXXX  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
17 XXXX  X  XXXXXXXXXXXXXXXX  X  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
16 XXXX  X  X  XXXXXXXXXXXXX  X  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
15 XXXX  X  X  XXXXXXXXXXXXX  X  XXXXXXXXXXXXXXXX  XXXXXXXXXXXXXXXXX
14 XXXX  X  X  X  XXXXXXXXXX  X  XXXXXXXXXXXXXXXX  XXXXXXXXXXXXXXXXX
13 XXXX  X  X  X  XXXXXXXXXX  X  XXXX  XXXXXXXXXX  XXXXXXXXXXXXXXXXX
12 XXXX  X  X  X  XXXXXXXXXX  X  XXXX  X  XXXXXXX  XXXXXXXXXXXXXXXXX
11 XXXX  X  X  X  XXXXXXXXXX  X  XXXX  X  XXXXXXX  XXXXXXX  XXXXXXX
10 XXXX  X  X  X  XXXX  XXXX  X  XXXX  X  XXXXXXX  XXXXXXX  XXXXXXX
 9 XXXX  X  X  X  XXXX  XXXX  X  X  X  X  XXXXXXX  XXXXXXX  XXXXXXX
 8 X  X  X  X  X  XXXX  XXXX  X  X  X  X  XXXXXXX  XXXXXXX  XXXXXXX
 7 X  X  X  X  X  XXXX  XXXX  X  X  X  X  X  XXXX  XXXXXXX  XXXXXXX
 6 X  X  X  X  X  XXXX  X  X  X  X  X  X  X  XXXX  XXXXXXX  XXXXXXX
 5 X  X  X  X  X  XXXX  X  X  X  X  X  X  X  XXXX  XXXXXXX  X  XXXX
 4 X  X  X  X  X  XXXX  X  X  X  X  X  X  X  X  X  XXXXXXX  X  XXXX
 3 X  X  X  X  X  XXXX  X  X  X  X  X  X  X  X  X  XXXXXXX  X  X  X
 2 X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  XXXXXXX  X  X  X
 1 X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  XXXX  X  X  X
```

The choice of the number of clusters is not a clear-cut matter. If there is a clear 'elbow' in the plot of dissimilarity indicator against the sequence of the steps, a sensible choice would be the clusters formed at the elbow. Lacking such an elbow, we choose the seven clusters formed at the 15th step, because two of the three largest clusters formed up to this step correspond roughly to two well-defined regions of origin : Eastern and Southern

Europe. Except for the Ukrainian group, the Eastern European groups turn out to be similar to the British, whereas the Jewish group is similar to the Southern European groups. The names of the seven clusters are showen in Table 4.(7)

Table 4: The Groupings of Immigrants Generated by Cluster Analysis.

Personal Factor	Distinctions
Ethnicity	
CHINESE-GERMAN	Chinese German Dutch British and Other Other Single Responses Other Multiple Responses
BRITISH-EASTERN EUROPEAN	Czechoslovakian Hungarian Polish (Croatian, Serbian, Yugoslavian) British
SOUTHERN EUROPEAN	Greek Italian Portuguese Jewish (African, Caribbean, Haitian)
FRENCH	French French and Other
SCANDINAVIAN	Scandinavian
UKRAINIAN	Ukrainian
BRITFRENCH	British and French
Education	
LOW	Less than Grade 5 Grade 5-8 SSGD Trades Certificate of Diploma
CRADE 9-13	Grade 9-13
NONUNIV	Non-university--with other certificate or dipoma
SOMEUNIV	University--without certificate, diploma or degree
UNIVERSITY	Non-university--without trades certificate or other non-university certificate or diploma Non-university-with trade certificate or diploma University--with certificate diploma University--Bachelors degree or higher

(continued)

(7)It is not the author's intent to imply that trade certificates or diplomas are equivalent to 'low education'. The label 'low eduction' is for descriptive purposed only, describing the general character of the group. Cluster analysis revealed that with respect to the destination choice patterns, individuals with such educational level are similar to the two least educated groups. Similarly, cluster analysis suggested that period of entry could be aggregated into two clusters.

Table 4: (continued)

Personal Factor	Distinctions
Period of Immigration	
PRE1946	Pre-1946 immigrants
POST1946	1946-1960 immigrants
	1961-1966 immigrants
	1967-1977 immigrants
	1977-1981 immigrants
Class of Work	
UNPAID	Unpaid family worker
PAID	Paid worker
SELFINC	Self-employed incroporated
SELFEMP	Self-employed
Occupation	
PRIMARY	Other primary industries
FARMING	Farming
	Horticulture
	Animal Husbandry
CONSTRUCTION	Construction Trades
HEALTH	Medicine and Health
TEACHING	Teaching and related
MACHINING	Machining, product fabrication, assembling and repair
	Processing
	Other occupations
	Artistic, literary, recreational
SOCIALSCIENCE	Occupation in Social Sciences and related Service
	Sales
	Occupation in Natural Sciences
	Transport and equipment operating
	Clerical and related
	Managerial, Administration and related

The applications of cluster analysis to the simplification of other personal factors are based on a subsample of 24,335 immigrants who are male and at least 15 years old, because children and many females were not in the labour force and hence had missing values for such variables as occupation and class of work. The resulting clusters are also shown in Table 4.

IV. THE MULTIVARIATE DESTINATION CHOICE MODEL

The immigration process can be considered as a three-level choice process. At the upper leveal, a person chooses to stay in their home country or to become an immigrant. At the middle level, an immigrant chooses to come to Canada or to go elsewhere. At the lower level, a Canadian immigrant chooses a particular province as the destination choice. In principle, such a process can be analyzed by a three-level nested logit model (Liaw, Kanaroglou, and Moffett, 1986). However, the lack of appropriate data precludes the study of the upper two levels, and hence our analysis is limited to the application of a single-level polytomous logit model.

Let P[j,g] be the probability that the immigrant with personal attribute g selects province j as the destination. Our model is of the following form:

$$P[j,g] = \exp\{b'Y[j,g]\}/\{\sum_{k=1}^{10} \exp\{b'Y[k,g]\} \quad (3)$$

where 'exp' stands for 'exponential function of'; b is a row vector of unknown parameters; and Y[j,g] is a vector containing two sets of dummy variables with values applicable to attribute g and province j. Using Newfoundland as the referent destination, the first set contains nine dummy variables: each corresponds to one of the remaining nine provinces. This set of dummy variables, to be called the provincial dummy variables, will allow the model to reflect and predict the fact that Ontario gets the lion's share of immigrants, British Columbia the second largest share, and so on. For example, one of these dummy variables may correspond to Ontario and hence assumes the value of 1 (if the chosen destination j is Ontario) or 0 (otherwise) ; its coefficient is expected to be the largest, because more than 50% of immigrants have chosen Ontario as the destination.

The second set of dummy variables includes the products of some dummy variable in the first set and the dummy variables representing the distinctions in some personal factors. For simplicity, we call these products interaction dummy variables. One of them may be the

product of the dummy variable corresponding to Ontario and the dummy variable indicating that the immigrant under consideration is a Southern European. The coefficient of this product is expected to be positive, because Southern European immigrants appear to have a particularly strong preference for Ontario. Since the destination choice model is inherently different from a standard log linear model, the inclusion of dummy variables representing the 'main effects' of personal factors is substantively meaningless. Technically, these dummy variables and their coefficients can be factored from both the numerator and the denominator of the model and then cancelled.

V. ESTIMATION METHOD

The parameters of the logit model are usually estimated by the maximum likelihood method, which is based on the assumption that the choices of destination are independent events. Since such an assumption is unlikely to be true, we use the maximum quasi-likeilhood (MQL) method proposed by Wedderburn (1974) and McCullagh (1983). In addition to allowing for the existence of dependent events, the MQL method is better than the ordinary least-square method in the sense that the former permits more reliable cases to play a greater role in estimating the values of the parameters and always yields predicted values within the range between zero and one.

Since the MQL method uses an iterative (Newton-Raphson) algorithm which is unlikely to converge when many independent variables are entered at the same time, the only practical way to construct a good specification of the model is to introduce a handful of terms at a time. We start with the 'null model' which contains all the provincial dummy variables but note of the interaction dummy variables. We then introduce a few interaction terms at a time, retaining those associated with a t-ratio with a magnitude greater than 2.0 and dropping the others. The variable with a t-ratio of such magnitude may be considered as statistically significant[8]. We call the constructed model with the largest number of significant variables the 'best' model.

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(8)The t-ratio approaches the standard normal variate as the sample size becomes very large. With 7 ethnic group, 5 education levels, 4 classes of work, 7 occupations, 3 income levels, 2 periods and 10 destinations, the number of observaitons of our input data matrix can be as high as 7*5*4*7*3*2*10=58,800. However, quite a few cells of the seven-way cross-tabulation turn out to be empty, our actual sample size is 12,920.

The goodness-of fit of a given specification of the model is measured by:

$$\text{Weighted } R^{**}2 = 1 - \frac{\text{WRMS of the given specification}}{\text{WRMS of the null model}} \quad (4)$$

where WRMS stands for the weighted residual mean square. Note that this measure incorporates a penalty for increasing the number of explanatory variables, because the greater the number of explanatory variables, the smaller the degress of freedom and the larger the WRMS of the given specification (Liaw, Hayes and McAuley, 1987).

To assess the relative importance of a personal factor in a multivariate context, we delete from the best model all interaction terms corresponding to the given factor and then observe the decrease in the weighted R**2. The greater the decrease, the more important the factor.

VI. ESTIMATION RESULTS OF THE DESTINATION CHOICE MODEL

The estimation results are summarized in Table 5. Ignoring the fact that the immigrants are heterogeneous, the null model shows that Newfoundland is significantly less attractive than all other provinces, except for PEIT which is about equally unattractive. Allowing the preferences to be affected by personal factors, the best model includes 40 significant interaction terms and has a high weighted R**2 of 0.830. It permits the following inferences for each of the six personal factors. Based on the likelihood criterion, we evaluate the importance of the interaction term according to the magnitudes of the associated t-ratios.(9)

Specific Findings from the Best Model

Ethnic origin. The French immigrants have a very strong preference for Quebec and a moderately strong preference for New Brunswick. The Chinese-German-Dutch immigrants have a moderately strong preference for Manitoba, Alberta and British Columbia. The Southern European immigrants have a very strong preference for Quebec and Ontario.

(9)Only those interaction terms that were statistically significant are presented. During the course of modelling, other interaction terms were incorporated into the model, but deleted from the final 'best-fit' models. Lack of space precludes their inclusion.

Scandinavian immigrants tend to ignore Quebec and Ontario. Ukrainian immigrants have a moderately storng preference for the three Prairie provinces and tend to ignore British Columbia. Finally, the British-and-French immigrants have a moderately strong preference for Quebec.

The substantive questions of (1) 'why' these patterns appear and (2) for which specific groups the existance of similar ethnic communities in the destination is important, are left for future research whereby the 'ecololgical' variables (i.e. the variables describing the properties of the alternatives in the choice set) such as employment growth and ethnic composition in the destination province can be evaluated within the context of a multivariate model. Such a task can be aided by a set of deveploped hypothesis concerning ethnic migration (Katzman, 1969; Trovato, 1988). This task would then provide a more meaningful explanation. For example, the use of interaction terms between the ecological variables and personal factors would allow us to explore whether the Germans' destination choice pattern depends more on economic variables or whether the Chinese destination pattern is contingent upon the existance of large ethnic communities in the destination.

Education. Immigrants with moderate level of education (grades 9 to 13) show a moderate tendency of avoiding Quebec and preferring British Columbia. Immigrants with college-level diploma also tend to avoid Quebec, whereas those with some university education tend to prefer British Columbia. Finally, the immigrants with university degrees show slightly higher preference for British Columbia and, surprisingly, have a moderately strong preference for the remote province of Newfoundland. This surprising result suggests that the few immigrants received by Newfoundland are mostly limited to those professionals who were transferred there by their employers.

Occupation. Immigrants engaged in farming tend to avoid Quebec and to prefer Saskatchewan and Alberta.[00] Immigrants in other primary occupations tend to avoid both Quebec and Ontario. Immigrants engaged in construction tend to avoid Quebec and to prefer Alberta. Immigrants in health professions seem to avoid Ontario and prefer Nova Scotia. Finally, there is strong evidence that immigrants engaged in machining prefer Ontario.

Class of work. It seems that self-employed immigrants in incorporated enterprise prefer Alberta, whereas unincorporated self-employed immigrants prefer Saskatchewan.

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[00] The implied causality could run in the opposite direction. For example, having located in Saskatchewan, immigrants find themselves participating in agriculture. However, such cases are, in our opinion, relatively rare.

Income. Immigrants with medium income ($20,00 - $ 29,999) tend to avoid Quebec and Manitoba and to prefer British Columbia. It is somewhat surprising that immigrants with high income tend to avoid not only Quebec and Manitoba but also Ontario.

Period of immigration. Immigrants who entered Canada after 1946 prefer Ontario and Quebec—the two most urbanized provinces. The preference for the former is much clearer than the preference for the latter.

Evaluation of the Relative Improtance of Personal Factors. The six tests in Table 5 show the results of deleting in turn each of the six personal factors from the best model. From the decreases in the value of the weighted R**2, we see that the ethnic factor is by far the most important determinant of the destination choice pattern: its deletion from the best model causes the weighted R**2 to decrease by 0.060. Test 1 shows that all remaining coefficients do no have any sign change and remain statistically significant. However, the effects of the remaining factors are not totally independent of the ethnic factor. For example, the deletion of the ethnic factor results in an increase in the attraction of the immigrants with university education by British Columbia and an increase in the repulsion of farming and high-income immigrants by Quebec. The importance of the ethnic factor suggests that ethnicity "subsumes many unmeasurable social, cultural and social psychological factors" associated with ethnic groups (Trovato and Halli, 1990, pp.77).

Occupation is clearly the second most important factor: its deletion from the best model causes the weighted R**2 to decrease by 0.024. Again, all the remaining cofficients retain their signs and continue to be statistically significant (Test 5). The deletion of the occupation factor causes only one marked change in the effects of the remaining factors: the attraction of the unincorporated self-employed immigrants by Saskatchewan is substantially enhanced.

Period of immigration is a factor of intermediate importance: its deletion from the best model cause the weighted R**2 to drop by 0.013 (Test 3). Since the remaining coefficients and their associated t-ratios show relatively small changes, the effects of this factor are quite independent of the effects of the other factors. Thus, the statement that post-1946

Table 5: The Estimation Results of the Logit Model

variable	"Null"model		Best model (best fit)		Test 1 (-ethnicity)		Test 2 (- education)		Test 3 (-period)		Test 4 (-C.O.W.)		Test 5 (-occupation)		Text 6 (-income)	
(1) Provincial Dummy Variable																
PEIT	-0.07	(-0.3)	0.67	(2.5)	0.72	(2.3)	-0.07	(-0.4)	0.66	(2.3)	0.67	(2.4)	0.68	(2.3)	0.69	(2.5)
Nova Scotia	1.18	(6.1)	1.90	(7.6)	1.95	(6.7)	1.15	(7.7)	1.89	(7.2)	1.90	(7.5)	1.94	(7.2)	1.92	(7.6)
New Brunswick	0.63	(3.0)	1.30	(5.0)	1.43	(4.8)	0.55	(3.4)	1.29	(4.8)	1.30	(5.0)	1.31	(4.7)	1.32	(5.0)
Quebec	3.88	(22.8)	3.83	(14.8)	4.54	(15.4)	2.98	(18.4)	4.29	(17.0)	3.83	(14.7)	3.67	(13.3)	3.67	(14.1)
Ontario	5.23	(30.9)	5.29	(21.5)	5.43	(19.1)	4.55	(32.5)	5.76	(23.0)	5.29	(21.4)	5.32	(20.3)	5.23	(21.1)
Manitoba	2.45	(13.9)	3.26	(13.1)	3.49	(12.3)	2.52	(17.5)	3.27	(12.7)	3.26	(13.1)	3.26	(12.3)	3.01	(12.1)
Saskatechewan	1.80	(9.9)	2.26	(9.1)	2.33	(8.1)	1.51	(10.5)	2.24	(8.7)	2.33	(9.4)	2.30	(8.7)	2.28	(9.1)
Alberta	3.50	(20.4)	3.93	(16.2)	4.19	(15.0)	3.19	(23.8)	3.94	(15.6)	3.95	(16.2)	4.04	(15.6)	3.96	(16.2)
British Columbia	4.01	(23.5)	4.45	(18.3)	4.51	(16.1)	3.81	(28.9)	4.47	(17.7)	4.45	(18.2)	4.45	(17.2)	4.55	(18.6)
(2) Interactions with Ethnicity																
NB*FRENCH			2.11	(6.3)			2.11	(6.3)	2.13	(6.1)	2.11	(6.3)	2.13	(6.0)	2.11	(6.3)
QUE*FRENCH			3.41	(35.9)			3.42	(35.9)	3.41	(34.6)	3.41	(35.7)	3.37	(33.7)	3.42	(35.8)
MTB*CHINESE			0.40	(5.0)			0.39	(4.8)	0.35	(4.2)	0.40	(4.9)	0.40	(4.7)	0.42	(5.1)
ALTA*CHINESE			0.4	(8.5)			0.43	(8.3)	0.39	(7.3)	0.44	(8.6)	0.44	(8.1)	0.42	(8.1)
BC*CHINESE			0.30	(7.1)			0.30	(7.1)	0.26	(5.9)	0.30	(7.1)	0.30	(6.7)	0.28	(6.5)
QUE*SEUROPEAN			1.97	(32.2)			2.02	(32.9)	2.03	(32.0)	1.97	(32.0)	1.88	(29.1)	2.02	(32.9)
ONT*SEURPOEAN			1.09	(22.2)			1.11	(22.6)	1.14	(22.6)	1.09	(22.1)	1.07	(20.7)	1.11	(22.7)
QUE*SCANDINAVIAN			-1.77	(-4.8)			-1.76	(-4.8)	-1.80	(-4.7)	-1.77	(-4.8)	-1.88	(-4.8)	-1.78	(-4.8)
ONT*SCANDINAVIAN			-1.34	(-10.0)			-1.33	(-9.9)	-1.37	(-9.9)	-1.34	(-10.0)	-1.37	(-9.7)	-1.34	(-10.0)
MTB*UKRAINIAN			1.08	(5.6)			1.07	(5.5)	1.17	(5.8)	1.08	(5.6)	1.07	(5.2)	1.11	(5.7)
SASK*UKRAINIAN			0.96	(4.1)			0.96	(4.0)	1.08	(4.4)	0.98	(4.1)	1.10	(4.5)	0.95	(4.0)
ALTA*UKRAINIAN			0.60	(3.9)			0.59	(3.8)	0.68	(4.3)	0.59	(3.8)	0.62	(3.8)	0.58	(3.7)
BC*UKRAINIAN			-0.71	(-3.5)			-0.72	(-3.6)	-0.63	(-3.0)	-0.71	(-3.5)	-0.72	(-3.3)	-0.73	(-3.6)
QUE*BRITFRENCH			1.58	(4.6)			1.61	(4.7)	1.58	(4.4)	1.58	(4.6)	1.59	(4.4)	1.61	(4.7)
(3) Interactions with Education																
QUE*GRADE9-13			-0.35	(-5.5)	-0.40	(-5.8)			-0.35	(-5.4)	-0.35	(-5.5)	-0.33	(-5.0)	-0.33	(-5.2)
BC*GRADE9-13			0.21	(3.8)	0.31	(4.9)			0.22	(3.8)	0.21	(3.8)	0.21	(3.6)	0.20	(3.5)
QUE*NONUNIV			-0.58	(-5.8)	-0.68	(-6.4)			-0.57	(-5.5)	-0.58	(-5.8)	-0.51	(-4.9)	-0.61	(-6.1)
BC*COMENUIV			0.48	(5.5)	0.67	(6.1)			0.47	(4.7)	0.48	(5.0)	0.50	(4.9)	0.48	(5.0)
BC*UNIVERSITY			0.12	(2.6)	0.32	(6.3)			0.10	(2.1)	0.12	(2.6)	0.14	(2.9)	0.17	(3.9)
NON-NFLD*UNIV			-1.34	(-4.7)	-1.47	(-4.5)			-1.31	(-4.4)	-1.34	(4.7)	1.35	(-4.5)	-1.39	(-4.8)

Table 5: (continued)

variable "Null"model	Best model (best fit)	Test 1 (-ethnicity)	Test 2 (- education)	Test 3 (-period)	Test 4 (-C.O.W.)	Test 5 (-occupation)	Text 6 (-income)
(4) Interactions with Occupation							
QUE*PRIMARY	-1.98 (-6.1)	-1.77 (-5.1)	-1.97 (-6.0)	-1.99 (-5.9)	-1.98 (-6.1)		-2.02 (06.2)
ONT*PRIMARY	-1.27 (-8.2)	-1.30 (-7.4)	-1.27 (-8.1)	-1.26 (-7.8)	-1.26 (-8.1)		1.27 (-8.1)
QUE*FARMING	-0.74 (-4.5)	-0.88 (-5.0)	-0.71 (-4.4)	-0.76 (-4.6)	-0.74 (-4.5)		-0.67 (-4.1)
SASK*FARMING	1.46 (8.7)	1.58 (8.4)	1.47 (8.8)	1.53 (8.9)	1.80 (12.9)		1.43 (8.5)
ALTA*FARMING	0.63 (6.2)	0.74 (6.4)	0.65 (6.3)	0.71 (6.8)	0.62 (6.0)		0.61 (6.0)
QUE*CONSTRUCTION	-0.96 (-12.0)	-0.73 (-8.3)	-0.93 (-11.6)	-0.96 (-11.6)	-0.96 (-11.9)		-0.97 (-12.0)
LTA*CONSTRUCTION	0.48 (7.0)	0.31 (4.0)	0.49 (7.1)	0.47 (6.7)	0.48 (7.1)		0.45 (6.6)
NS*HEALTH	0.79 (2.5)	0.84 (2.3)	0.77 (2.4)	0.77 (2.4)	0.78 (2.5)		0.84 (2.7)
ONT*HEALTH	-0.28 (-2.7)	-0.27 (-2.3)	-0.29 (-2.9)	-0.26 (-2.5)	-0.28 (-2.8)		-0.31 (-3.0)
ONT*MACHINING	0.28 (9.0)	0.27 (7.4)	0.28 (8.9)	0.30 (9.0)	0.29 (9.0)		0.30 (9.6)
(5) Interactions with Class of Worker							
ALTA*SELFINC	0.32 (3.2)	0.31 (2.7)	0.32 (3.2)	0.32 (3.0)		0.33 (3.1)	0.36 (3.5)
SASK*SELFEMP	0.55 (3.8)	0.56 (3.5)	0.55 (3.8)	0.57 (3.9)		1.09 (8.6)	0.57 (3.9)
(6) Interactions with Income							
QUE*MEDINC	-0.32 (-6.1)	-0.38 (-6.6)	-0.32 (-6.1)	-0.32 (-5.9)	-0.32 (-6.1)	-0.32 (-5.7)	
MTB*MEDINC	-0.43 (-4.6)	-0.40 (-3.7)	-0.43 (-4.6)	-0.44 (-4.5)	-0.43 (-4.5)	-0.42 (-4.2)	
BC*MEDINC	0.28 (6.5)	0.30 (6.0)	0.27 (6.3)	0.27 (6.0)	0.28 (6.5)	0.27 (6.0)	
QUE*HIGHINC	-0.43 (-6.3)	-0.63 (-8.7)	-0.41 (-6.1)	-0.44 (-6.2)	-0.43 (-6.4)	-0.36 (-5.0)	
ONT*HIGHINC	-0.33 (-7.6)	-0.41 (-8.3)	-0.34 (-7.7)	-0.34 (-7.5)	-0.34 (-7.7)	-0.38 (-8.3)	
MTB*HIGHINC	-0.82 (-6.9)	-0.80 (-5.8)	-0.83 (-6.9)	-0.83 (-6.7)	-0.83 (-6.9)	-0.80 (-6.3)	
(7) Interactions with Period of Immigration							
QUE*POST1946	0.52 (5.3)	0.63 (6.2)	0.52 (5.3)		0.52 (5.3)	0.57 (5.5)	0.52 (5.3)
ONT*POST1946	0.54 (9.5)	0.67 (10.4)	0.54 (9.3)		0.55 (9.5)	0.60 (9.9)	0.55 (9.4)
R-squared	0.830	0.770	0.828	0.817	0.828	0.806	0.828
Decrease in R**2		0.060	0.002	0.013	0.002	0.024	0.002

NOTE: Adjusted t-rations are bracketed beside estimated coefficient value.

immigrants have stronger preference for Ontario and Quebec is a rather general and robust statement.

The least important factors seem to be education, class of work, and income: the deletion of each of them from the best model only causes the weight R**2 to decrease by 0.002 (Tests 2,4 and 6). The remaining coefficients do not show any marked change as a consequence of each deletion. It is interesting to note that the effects of education and income are fairly independent: the only notable change due to the deletion of the income factor is the increase in the attraction of the immigrants with university degrees by British Columbia. Finally, the only noticeable effcet of the deletion of class of work is an increase in the attraction of the immigrants with the farming occupation by Saskatchewan.

CONCLUSION

This paper has set out to assess the importance of six personal factors on the 'established' destination choice patterns of the immigrants in Canada within a multivariate framework by applying a multivariate logit model to a large number of observations in the Public Use Sample of the 1981 census.

We have found that ethnic origin is by far the most important personal factor on the immigrant' choice of provinces. The choice patterns partly reflect the general regions of the source countries. For example, Southern European (Greek, Italian and Portuguese) immigrants all show relatively strong preferences for both Ontario and Quebec. However, we have also found that immigrants from very different parts of the world happen to have similar choice patterns. For example, Chinese, Dutch and German immigrants all display relatively strong preferences for British Columbia and Alberta. The importance of the ethnic factor suggests that the cultural landscape of Canada will remain patchy, with new pieces emerging as new waves of immigrants of different ethnic origins head for their preferred destination; and that the provinces (e.g. British Columbia) which are strongly preferred by the immigrants of 'new' ethnic groups (e.g. Chinese) are likely to grow faster than the rest of the country, although the positive effect of immigration on Ontario's population growth is guaranteed by the fact that Ontario is the most preferred destination of most ethnic groups.

The second most important personal factor, namely occupation, is economic in nature. Some effects of this factor are quite understandable: farming immigrants show a greater preference for the Prairie provinces of Saskatchewan and Alberta, whereas immigrants in

machining and other manufacturing occupations have a strong preference for the most industrialized province, namely Ontario. Other effects are less easy to understand: the immigrants engaged in construction tend to ignore Quebec and to prefer Alberta, although the construction boom accompanying the expansion of the energy industry in the 1970's in Alberta provides a partial explanation.

Of moderate importance is the period of immigration. By the end of World War Two, the Prairie provinces had been mostly settled and central Canada was rapidly industrializing and urbanizing. It seems quite understandable that our results show that the post-1046 immigrants have a stronger preference for the central provinces of Ontario and Quebec.

Education, class of work and income appear to be relatively unimportant. The weak effect of the education factor suggests that immigration probably does not have much effect on the spatial variation in the quality of human capital in Canada. The weak explanatory power of class of work and income leaves occupation to be the only importnat economic factor. It is interesting to note that the current Canadian immigration policy on the so-called economic or independent class, composed of entrepeneurs, self-employed immigrants and immigrants with desired job skills (Samuel and Woloski, 1985; Seward, 1986), is used by the Canadian government as a tool to counter short-run labour shortages (Weiner, 1987). Immigration policies aimed at directing or channelling immigrants to specific locations in response to economic development need may, however, be ineffective in the long-run. Economic, kinship and social factors may promote the re-arrangement of immigrants away from their initial location. Such policies would achieve greater success if they are designed to channel immigrants to areas with similar ethnic composition and occupation-specific requirements.

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個人因素對加拿大移民目的地選擇型態的影響：多變項的衡量法

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本文的目的是探討六項個人因素（種族、教育、水準、職業、主雇類別、所得、移民時期）對加拿大移民目的地選擇型態的影響。分析資料來自一九八一年人口普查的百分之二的抽樣資料。個人因素的相對重要性是靠多變項邏輯模型來衡量。因原始資料的分類太多，不便直接應用 LOGIT 模型，我們先用聚類分析 (cluster analysis) 把分類減少。

雖然上述六項個人因素都在統計上對移民的目的地選擇型態顯出某種程度的影響，它們的相對重要性卻差別甚大。最重要的影響因素是種族，其次是職業和移民時期。其它三項因素則不太重要。

基於資料分析的結果，我們認爲加拿大移民之目的地選擇型態會繼續導引出片塊狀的文化景觀，但對人力資源品質上的空間差異不會有太大的影響。

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