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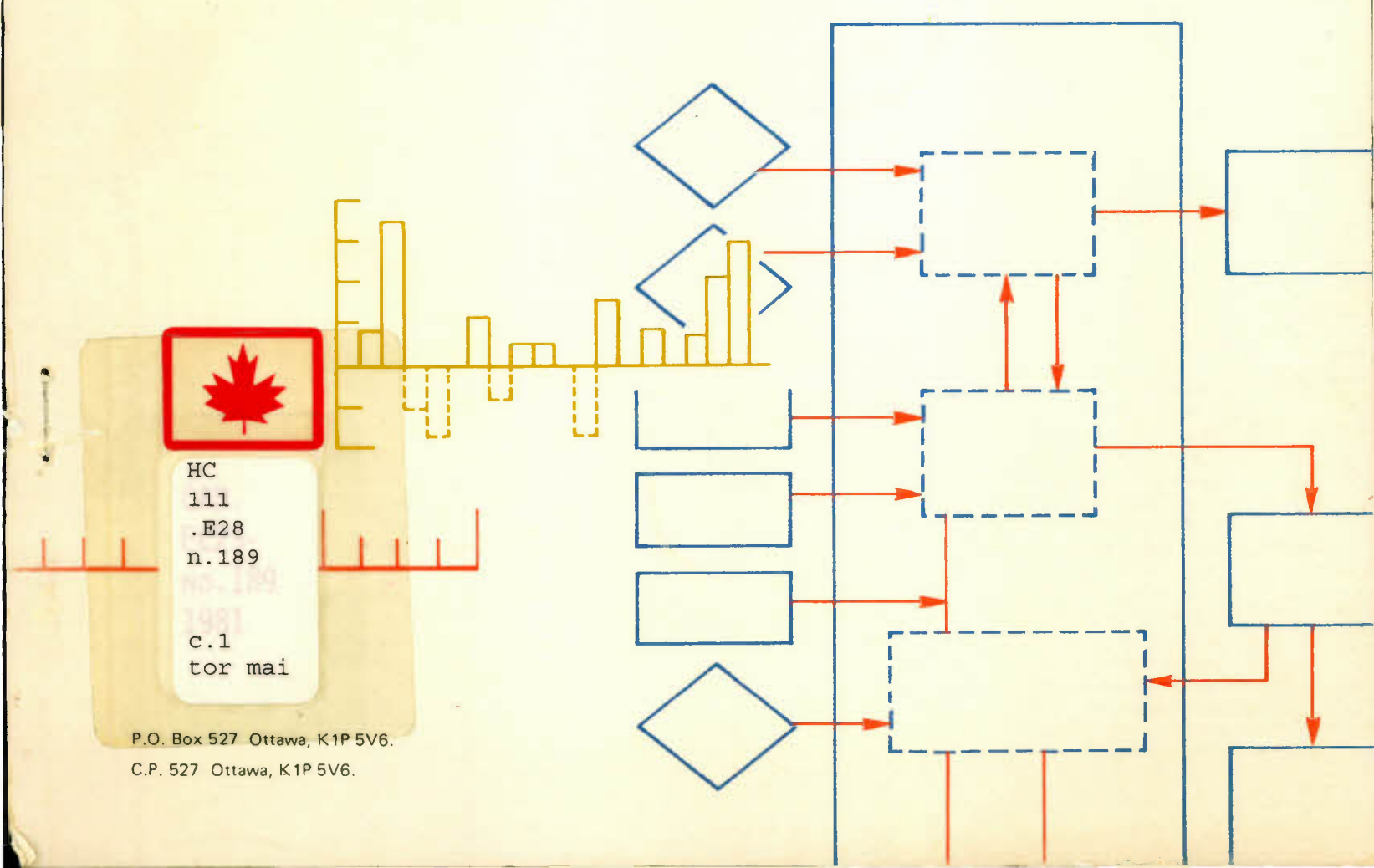

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DISCUSSION PAPER NO. 189

The Economic Implications of Migration to Newfoundland

by R. W. Boadway and A. G. Green

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RÉSUMÉ

Dans le présent Document, l'auteur examine la nature complexe de la migration intraprovinciale et interprovinciale à Terre-Neuve, et le rôle qu'elle joue dans l'ajustement du marché du travail. Le premier chapitre étudie la nature et les déterminants des flux de migration brute. Les deuxième et troisième chapitres se servent des données du recensement en vue d'analyser les caractéristiques socio-économiques des migrants et les gains de revenue attribuables à la migration. Le chapitre 4 présente un modèle économétrique de la migration nette illustré par cinq équations.

Le nombre net d'émigrants de Terre-Neuve qui s'établissait en moyenne à plus de 3 000 personnes par année par rapport à une émigration brute se chiffre à plus de 12 000 personnes par année au cours de la dernière décennie, a ralenti, surtout en raison d'une hausse récente de l'immigration vers Terre-Neuve. L'Ontario qui accueille ordinairement la moitié des émigrants de Terre-Neuve est devenue une exportatrice nette de travailleurs vers cette province au cours de la première moitié de 1970. A l'aide d'équations de régression simples et descriptives, nous démontrons qu'une augmentation de 10 % des salaires à Terre-Neuve par rapport à l'Ontario encourage apparemment environ 4 000 migrants virtuels par année à demeurer à Terre-Neuve et 4 000 ou 5 000 émigrants à y rentrer (par contre, des régressions subséquentes sur la migration nette au chapitre 4 indiquent que les effets des salaires sont moins important que ces derniers chiffres). Une hausse de 1 000 emplois en Ontario aura semble-t-il pour effet d'inciter neuf personnes à quitter Terre-Neuve. Même si les transferts ne semblent pas influer sur les départs, une augmentation de 10 % des prestations d'assurance-chômage par rapport aux salaires à Terre-Neuve, toutes choses étant égales par ailleurs, se traduit apparemment par 3 000 immigrants par année.

Les données des Recensements de 1971 et 1976 indiquent que plusieurs types distincts de migration se produisent simultanément. De nombreux Terre-Neuviens natifs de cette province et y ayant terminé leurs études secondaires (et souvent bénéficie également d'une formation professionnelle) quittent Terre-Neuve à l'approche et au début de la vingtaine, principalement pour se rendre en Ontario, mais aussi dans les Maritimes, et de plus en plus en Alberta. Ils n'amènent que peu d'enfants avec eux, environ 15 seulement par 100 émigrants. Un certain nombre de ces émigrants nés à Terre-Neuve sont installés à demeure dans le reste du Canada; en 1971, leur taux d'activité y était très élevé (85 % pour les hommes par comparaison à 77 % pour les hommes du reste du Canada), et au départ, ils gagnaient des revenus supérieurs à ceux de leurs homologues de Terre-Neuve. Leurs revenues ont d'ailleurs tendance au fil des ans à s'accroître davantage que ceux des autres Canadiens. Le reste de ces émigrants Terre-Neuviens reviennent chez eux et représentent environ la moitié de l'immigration brute dans cette province. Accompagnés de peu d'enfants, ils acceptent ordinairement

une réduction de leurs revenus pour y revenir. Leur taux d'activité baisse à environ 79 % et ils connaissent un taux de chômage plus élevé que les Terre-Neuviens restés dans la province en particulier (surtout à cause du fait que le taux d'activité de ces derniers n'est que de 64 %).

Les immigrants à Terre-Neuve qui sont nés ailleurs sont généralement un peu plus âgés, soit à la fin de la vingtaine ou au début de la trentaine, plus instruits, gagnent des revenus plus importants et connaissent des taux de chômage moins élevés que s'ils étaient demeurés ailleurs au Canada. Ils se déplacent souvent en groupes familiaux et peuvent compter environ 30 enfants pour 100 migrants. Ils continuent à toucher des revenus élevés s'ils restent plus de cinq ans, mais certaines données indiquent que bon nombre d'entre eux n'habitent Terre-Neuve que pour une période relativement brève avant de retourner dans d'autres parties du Canada sans augmentation de leur revenu.

Cette tendance de la migration indique l'existence d'un excédent relatif de Terre-Neuviens natifs de la province, qui y ont fait leurs études secondaires et dont un certain nombre trouvent de meilleures possibilités d'emploi dans le reste du Canada; il semble aussi que Terre-Neuve connaît une pénurie relative de travailleurs instruits et hautement qualifiés qu'elle s'efforce de combler en attirant ce genre de travailleurs du reste du Canada. Bien que ceux qui immigrent pour la première fois connaissent une augmentation de leur revenu relatif, et que celui-ci continue de s'accroître s'ils demeurent plus de cinq ans, les migrants qui reviennent chez eux, dans les deux directions, semblent retourner dans leur province pour des raisons qui ne sont pas d'ordre économique. Par conséquent, l'immigration brute dans cette province à faible revenu et au chômage élevé s'explique en partie par les migrants qui reviennent et en partie par les mesures en vue de remédier à la pénurie de travailleurs qualifiés dans la population active de Terre-Neuve. Il semble que les migrants qui reviennent gagnent des salaires moins élevés et sont plus exposés au chômage que s'ils étaient restés dans d'autres parties du Canada, mais par ailleurs, ils ont moins d'enfants, un degré de scolarité plus élevé, un meilleur revenu et une plus forte probabilité de se trouver un emploi que la population des Terre-Neuviens sédentaires. Ils ont acquis une plus grande expérience du travail que les très jeunes Terre-Neuviens qui quittent. Ils contribuent donc à accroître les niveaux de compétence et de revenus de la population active de Terre-Neuve. En conséquence, cet échange de capital humain ne semble pas défavorable à l'économie de Terre-Neuve.

Passons ensuite au modèle économétrique de la migration nette, il semble que le taux de salaire à Terre-Neuve soit principalement influencé par des forces visant à réaliser la parité des salaires avec le Canada central (l'Ontario dans le modèle). Même si le taux de chômage local semble n'exercer absolument aucune influence sur les salaires à Terre-Neuve (peut-être parce qu'il ne mesure pas avec précision le chômage réel à Terre-Neuve), on semble néanmoins penser que la croissance de l'offre de main-d'oeuvre locale, toutes choses étant égales par ailleurs, exerce un faible effet déprimant sur les salaires locaux.

Quatre éléments semblent déterminer l'émigration nette de Terre-Neuve. Ce sont le niveau des salaires à Terre-Neuve par rapport à ceux du reste du Canada, le nombre de jeunes Terre-Neuviens entrant dans le marché du travail, la vigueur de l'économie dans le reste du Canada, et le niveau des prestations d'assurance-chômage par rapport aux niveaux des salaires à Terre-Neuve. Une augmentation des salaires, à Terre-Neuve, de 10 % par rapport à l'Ontario, réduirait apparemment les départs nets de 1 300 à 2000 personnes par année; une augmentation du nombre de jeunes de 16 ans, par exemple de 100 par rapport à l'année précédente, entraîne apparemment une augmentation des départs nets d'environ 80 personnes; une hausse du taux de chômage en Ontario d'un point de pourcentage diminuera apparemment les départs nets d'environ 1 000, en partie à cause des possibilités moins nombreuses qui s'offrent aux jeunes Terre-Neuviens en Ontario et également par les mises à pied possibles de Nerre-Neuviens en Ontario qui les incitent à retourner chez eux. Ainsi, Terre-Neuve semble jouer le rôle d'un volant régulateur pour l'économie de l'Ontario, ce qui permettrait d'expliquer pourquoi les taux de chômage fluctuent deux fois plus à Terre-Neuve au cours du cycle économique qu'ils ne le font en Ontario. Enfin, si la moyenne des prestations d'assurance-chômage hebdomadaires versées à chaque prestataire à Terre-Neuve augmentait de 10 % par rapport à la rémunération hebdomadaire moyenne, les départs nets annuels pourraient diminuer de 1 700 personnes. Tel que mesuré à l'heure actuelle, le taux de chômage à Terre-Neuve n'exerce pas d'influence sur la migration.

Il semble que pour chaque augmentation de $ 10 des salaires réels calculés en dollars de 1961, le taux d'activité croisse de deux points de pourcentage, mais qu'il soit légèrement réduit par toute augmentation du nombre de jeunes d'âge actif. Les taux de chômage n'influent pas sur le taux d'activité de la population active. La demande de main-d'oeuvre à Terre-Neuve semble inélastique en ce qui concerne les salaires, surtout à court terme.

Bref, le mécanisme de la migration semble jouer le rôle d'un mécanisme complexe et très actif d'ajustement dans les marchés du travail de Terre-Neuve et du centre du Canada. La performance du marché du travail de Terre-Neuve est fortement tributaire de ce qui se passe dans le reste du Canada, notamment en Ontario.

ABSTRACT

This paper enquires into the complex nature of migration to and from Newfoundland, and the role it plays in labour market adjustment. The first chapter looks at the nature and determinants of gross migration flows. The second and third chapters use census data to analyse the socio-economic characteristics of the migrants and the income gains from migration. An illustrative five equation econometric model of net migration is presented in Chapter 4.

Net outmigration from Newfoundland, which averaged more than 3000 persons per year compared to gross outmigration of more than 12,000 per year in the past decade, has been slowing down, mainly because of a recent increase in migration to Newfoundland. Ontario, which typically receives about half of Newfoundland's out-migrants, became a net exporter of people to that province in the first half of the 1970's. Using simple descriptive regression equations, it is demonstrated that a 10 per cent increase in wages in Newfoundland relative to Ontario apparently encourages about 4000 potential out-migrants per year to stay in Newfoundland and an extra 4000 to 5000 migrants to enter (but subsequent regressions on net migration in Chapter 4 suggest wage effects that are smaller than these). An increase in Ontario employment by 1000 jobs will apparently induce 9 people to leave Newfoundland. While transfers do not appear to affect out-migration, a 10 per cent increase in unemployment insurance benefits relative to wages in Newfoundland will, other things equal, apparently induce 3000 additional in-migrants per year.

Census data for 1971 and 1976 show that there are several distinct kinds of migration going on simultaneously. Many native-born Newfoundlanders with high school education (and frequently with some vocational training as well) leave Newfoundland in their late teens and early twenties, primarily for Ontario, but also for the Maritimes, and increasingly for Alberta. They take few children with them -- only about 15 per hundred out-migrants. Some of these Newfoundland-born migrants stay in the rest of Canada where in 1971, they had a very high labour force participation rate (85% for males compared to 77% for males in the rest of Canada), where they initially earned incomes that were larger than their counterparts in Newfoundland and where their incomes tend to rise still more relative to other Canadians as time passes. The remainder of these Newfoundland-born out-migrants return to Newfoundland, making up about half the gross in-migration to that province. They do not bring many children with them, they tend to take some reduction in incomes to come home, their male labour force participation rate falls to about 79% and they experience a higher unemployment rate than local Newfoundlanders who never left the province (largely because the latter have a participation rate of only 64%).

Those in-migrants to Newfoundland who were born elsewhere tend to be older, in their late 20's and early 30's, to have more education, and to experience larger incomes and lower rates of unemployment than if they had stayed in the rest of Canada. They tend to move in family groups, bringing about 30 children per hundred migrants with them. They continue to earn high incomes if they stay beyond five years, but evidence suggests that many of them stay in Newfoundland for a relatively short time before returning to the rest of Canada without any increase in income.

This migration pattern suggests that there is a relative surplus of young high school educated, native-born Newfoundlanders, some of whom find better job opportunities in the rest of Canada, and that there is a relative shortage of highly educated and highly skilled people in Newfoundland -- a shortage that is made up by drawing such workers from the rest of Canada. While first-time migrants experience an increase in relative income which continues to grow if they stay beyond five years, back migrants in both directions appear to be returning home for non-economic reasons. Hence gross in-migration to this low income, high unemployment province is explained partly by back-migration, and partly to overcome a skill imbalance that exists in the Newfoundland labour force. Back-migrants to Newfoundland apparently earn less and face more unemployment than if they had stayed in the rest of Canada, but they do have fewer children, more education, more income and a higher probability of being employed than the resident population of Newfoundlanders who stay home. They have more work experience than the very young Newfoundlanders who leave. They therefore act to raise the skill and income levels of the Newfoundland labour force. Therefore, this human capital exchange does not appear to be unfavourable to the Newfoundland economy.

Turning to the econometric model of net migration, it appears that the Newfoundland wage rate is predominantly influenced by forces tending to produce wage parity with central Canada (Ontario in the model). While the local unemployment rate seems to have absolutely no influence on Newfoundland wages (perhaps because it does not accurately measure true unemployment in Newfoundland), there is a suggestion that growth in the local labour supply does, other things equal, have a faint depressing effect on local wages.

Net outmigration from Newfoundland is apparently determined by four things. These are the level of Newfoundland wages relative to those in the rest of Canada, the volume of young Newfoundlanders entering the labour markets, the buoyancy of the economy in the rest of Canada, and the level of unemployment insurance benefits relative to wage levels in Newfoundland. A 10 per cent increase in wages in Newfoundland relative to Ontario will apparently reduce net outmigration by 1300 to 2000 people per year; an increase in the number of 16 year olds by, say 100 over the previous year apparently encourages an increase in net outmigration by some 80 persons; an increase in the unemployment rate in Ontario by one percentage point will apparently reduce net outmigration by about 1000 persons, partly be reducing opportunities for young Newfoundlanders in Ontario and possibly by laying Newfoundlanders off in Ontario so they return home. Newfoundland thus seems to play the role of a balance wheel for the Ontario economy, which may help to explain why unemployment rates fluctuate twice as much in Newfoundland over the course of the business cycle as they do in Ontario. Finally, if the average weekly unemployment insurance benefits paid per unemployment insurance claim in Newfoundland were to increase 10 per cent relative to the average weekly earnings, net outmigration per year would apparently decline by some 1700 persons. The level of unemployment in Newfoundland, as it is currently measured, has no influence on migration.

The labour force participation rate apparently rises some two percentage points for each $10 increase in real wages measured in 1961 prices and it is slightly reduced by any increase in the number of young people reaching working age. Unemployment rates do not affect labour force participation. The demand for labour in Newfoundland appears to be inelastic with respect to wages, especially in the short run.

In summary, the migration mechanism appears to be a rather complex and very active adjustment mechanism in the Newfoundland and Central Canadian labour markets. The performance of the Newfoundland labour market is very much dependent on what goes on in the rest of Canada, notably Ontario.

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CHAPTER I

Patterns of Interprovincial Migration

Massive movements of population both between Canadian provinces and to and from Canada have been an important element in the development of the Canadian economy. This section starts with this observation and puts the gross and net population flows to Newfoundland in the perspective of long-term interprovincial movements, and shows the annual trends in in- and out-migration over the last decade and a half. In the last section of this chapter an econometric test is made of the determinants of annual gross in- and out-migration to Newfoundland.

Population redistribution and differential regional economic growth have been long standing themes in discussions on the evolution of the Canadian economy. As a small country, dependent on the vagaries of the world markets, and with widely divergent regional resource endowments the "match" between population and economic change is critical. Indeed part of the observed regional income disparities arise as a result of the slowness at which population adjusts to such external changes.

The last decade and a half exemplifies this point on the balancing of population and changes in regional fortunes. Table I-1 shows net out-migration, by province, on a quinquennium basis over the period 1961 to 1976. The data are based on annual family allowance records adjusted to include an estimate of total migration, that is including movers not covered by the family allowance scheme. As this Table indicates there has been a dramatic change in the recent patterns of internal migration over what has

TABLE I-1

Net Interprovincial Migration Quinquennially, 1961-1966, 1966-1971 and 1971-1976

(thousands)

	1961-66	1966-71	1971-76
Newfoundland	-15.2	-19.3	-1.9
P.E.I.	-3.0	-2.8	3.8
Nova Scotia	-27.1	-16.4	11.3
New Brunswick	-25.7	-19.6	16.8
Quebec	-19.9	-122.7	-77.6
Ontario	85.4	150.7	-38.6
Manitoba	-23.5	-40.7	-26.8
Saskatchewan	-42.1	-81.4	-40.8
Alberta	-2.0	32.0	58.6
British Columbia	77.7	115.0	92.3
Yukon/N.W.T.	-4.7	5.2	2.9

Source: Statistics Canada, International and Interprovincial Migration in Canada (July 1977) pp. 43-48 (Col. #91-208)

been thought of as "normal". First, the Maritime provinces changed from a net outflow of people during the sixties to a region experiencing net in-migration in the 1970's. Although we have not reproduced the trend in gross flows, a study of the underlying data shows that the main reason for this shift has been a combination of decreased outflow (except for Newfoundland) and increased inflow. Second, in the first half of the seventies Ontario switched from net in-migration to out-migration. This is the first time in the post-war period Ontario has experienced net outflow of people. Third, Alberta which had varied over the last two decades between experiencing net in-migration and out-migration, shifted towards the former in the late sixties and this trend in population inflows became even stronger in the early seventies. In fact between 1971 and 1976 Alberta ranked second among provinces in net in-migration. British Columbia experienced the largest net inflow during this period (Table I-1).

When one observes trend changes as dramatic as these the first question is whether they constitute a distinct break with past events or are simply a repeat of old patterns. Leroy Stone, reviewing this same data, wrote as follows:

> Have we... witnessed a major shift in historic (since 1971) migration patterns? My answer is "no" with one exception, the steadily growing attraction of Alberta. ...The likely recent appearance of positive net migration gains in some Atlantic Provinces has historical precedents as early as the 1930's. The so-called reversal of heavy net migration losses from Saskatchewan is a restoration of historic patterns, not a new trend.[1]

Stone provides no evidence to support these conclusions. As a partial check, Table I-2 is presented. This table shows net interprovincial migration

TABLE I-2

Net Interprovincial Migration in Canada,
Decennially, 1881-1961
(thousands)

	1881-91 (1)	1891-1901 (2)	1901-11 (3)	1911-21 (4)	1921-31 (5)	1931-41 (6)	1941-51 (7)	1951-61 (8)
1) Newfoundland	n.a.	n.a.	- 9	-15	-17	-17	-17	-15
2) P.E.I.	-14	-17	-17	-14	- 9	- 2	-12	-11
3) Nova Scotia	-43	-40	-28	-37	-70	+ 2	-39	-34
4) New Brunswick	-44	-32	-30	-25	-43	-13	-42	-37
5) Quebec	-132	-121	-29	-99	-10	-32	-12	+205
6) Ontario	-84	-144	+74	+46	+129	+75	+305	+685
7) Manitoba	+52	+48	+111	+24	-10	-41	-61	- 5
8) Saskatchewan	n.a.[1]	n.a.	+283	+78	- 5	-138	-199	- 9
9) Alberta	n.a.	n.a.	+218	+85	+22	-35	- 7	127
10) B.C.	+37	+58	+164	+58	+101	+72	+230	+240
11) Yukon/N.W.T.	+21	+68	-31	- 4	- 1	-	6	4

Note: (1) Saskatchewan and Alberta were combined with Yukon and NWT until 1901.

Sources: 1881-1941, Nathan Keyfitz, "The Growth of Canadian Population", *Population Studies*, Vol. 4 (June 1950).
1941-1961, Census of Canada.
Net migration estimates for Newfoundland (except for 1951-61) were provided by the Economic Council of Canada.
For 1941-51, 1951 Census of Canada, Vol. X, "General Review", p. 13.

estimates which go back on a decennial basis to 1881, with the exception of Newfoundland. In terms of the Maritime Provinces, Stone's interpretation seems wrong. In-migration to this region occurred in only one decade (1941-51) since 1881. This net inflow was to Nova Scotia and is largely associated with the Second World War; that is, with the build-up of naval and army bases. When this special condition was removed the Province re-established its former pattern of net out-migration. The recent shift toward in-migration to the Maritime provinces, then, is a break from past experience. In terms of Saskatchewan it is hard to know exactly what Stone means. Net out-migration has been the persistent pattern for this province since the inter-war years. Alberta has followed this same general pattern except during 1951-61 when net in-migration occurred. The decade of the sixties for Alberta exhibited a mixed pattern with small net out-migration in the first half of the decade followed by a strong reversal during the period 1966-71. Finally the case of Ontario is most interesting. The last period when this province experienced negative migration was the last two decades of the Nineteenth Century - a period when the U.S. and the Canadian West were being opened and a time, supposedly, when settlement possibilities in Ontario had evaporated. The main areas of expansion at that time were located in the Western regions of North America. Between these two periods the province has been a net receiver of population both from other provinces and from outside the country.

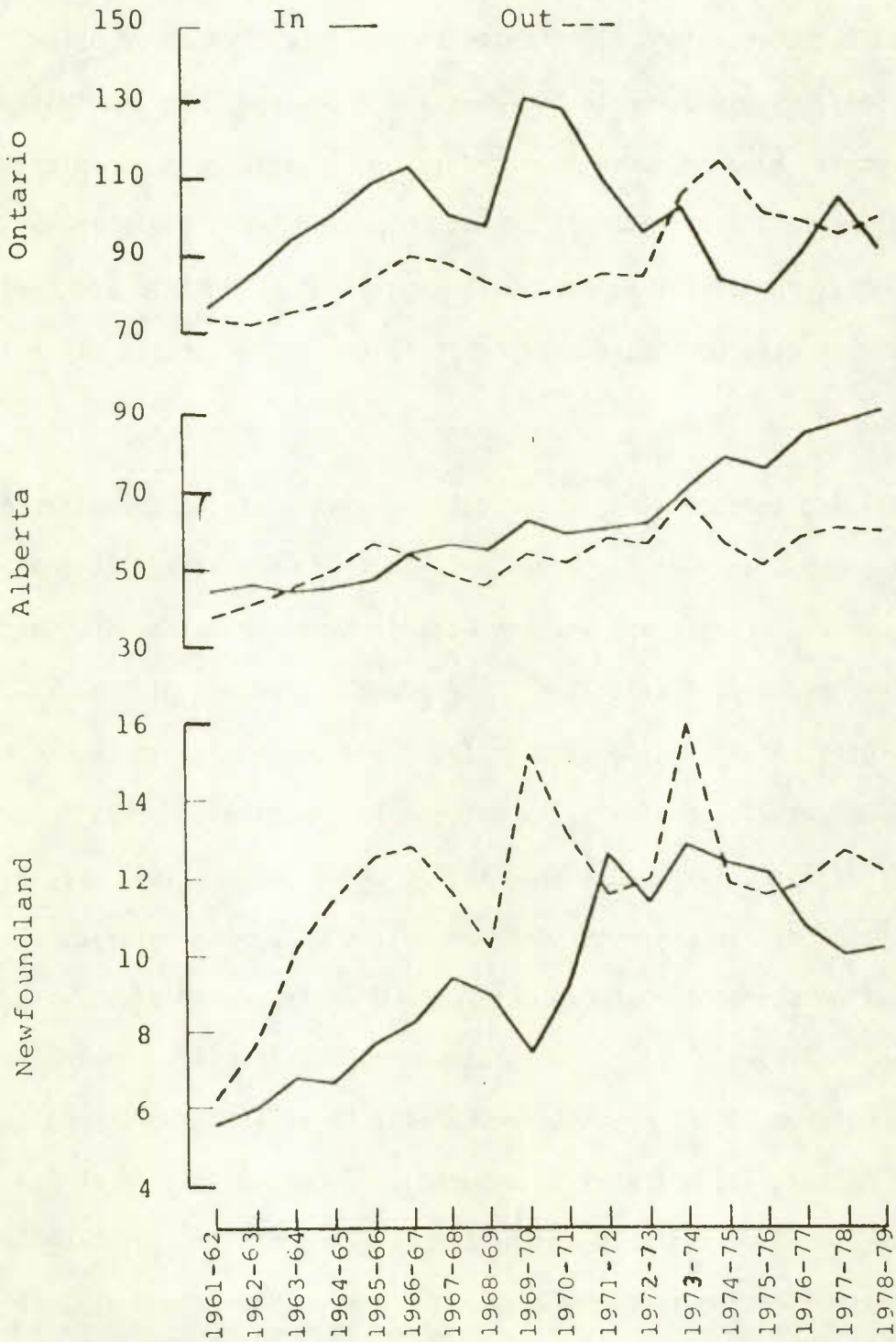
The main conclusion is that, contrary to Stone's statement, there has been a "shift" in historic migration patterns. This is the first time in the last century that we have observed in Canada, simultaneously, an exodus from the Central Provinces and a net inflow to both Alberta (and

British Columbia), and the Maritime Provinces. The primary question then is what is the nature of these new flow patterns. Do they represent a permanent re-allocation of population or is the shift of a temporary nature and due to be quickly reversed; that is, return to normal patterns - out-flows from the Prairies, Quebec, the Atlantic Provinces and net inflows to Ontario and British Columbia.

This question obviously cannot be answered here but it might be instructive to review the patterns of gross population flows concentrating mainly on the province of primary interest in this study, Newfoundland. Chart I-1 shows annual gross in- and out-migration to Newfoundland, Ontario and Alberta. Ontario and Alberta were selected for comparison since the former has accounted for approximately 50% of all migrants moving between Newfoundland and the other provinces while Alberta might be considered the province providing an attractive alternative to Ontario for Newfoundland migrants, especially during the last decade. The first point to note is that for these three provinces total migration (the sum of in- and out-migration) is larger in the seventies than in the early sixties. Second, in the seventies net migration (gross in-migration minus gross out-migration) declined in Ontario and Newfoundland but increased in Alberta. For Newfoundland the main cause of the decline in net out-migration was due to an increase in gross in-migration while for Ontario it was due to a decline in gross in-migration in the seventies compared with the experience of the previous two decades. For Alberta the increase was caused by a sharp rise in in-migration, especially after 1971/72. Third, for Newfoundland gross out-migration increased sharply beginning in the early sixties, levelling off by the end of the decade. Between 1968/9 and 1975/6, however, the

CHART I-1

Interprovincial Migration
In- and Out-Migration 1961-79
Newfoundland, Alberta and Ontario



Source: Economic Council of Canada

outflow became erratic exhibiting substantial annual changes in the volume of population movement. For Ontario and Alberta the major change in the level of outflow has been in the seventies; that is, sharply up for Ontario but down for Alberta. Finally it is worth noting that an interesting difference in the direction of gross in-migration to Ontario and Newfoundland has occurred in recent times. Beginning in the late sixties when in-migration to Ontario fell, in-migration to Newfoundland increased. In the latter part of the seventies, however, when in-migration to Ontario rose, in-migration to Newfoundland fell. Although it cannot be proven here, there appears to be a close relationship between economic conditions in Ontario and Newfoundland. This link will be tested explicitly in the third section of this chapter.

Table I-3 sets out, for three quinquennial periods, the distribution of in-, out-, gross and net migration between Newfoundland and the Atlantic Provinces, Quebec, Ontario and Western Canada where the latter includes the Yukon and the Northwest Territories. For example, Panel A of Table I-3 shows that total out-migration from Newfoundland to Ontario in the five year period 1961-66 was 24,258 and 31,713 between 1971 and 1976. Ontario received roughly half of all out-migrants from Newfoundland between 1961 and 1976 and about 50% of all in-migrants to Newfoundland came from Ontario. These large population movements between Ontario and Newfoundland provide some insight into the inverse relationship between gross in-migration to the two provinces mentioned in the previous paragraph. Next it is worth noting that the drop in net migration (Panel C) between 1961-66 and 1971-76 to Newfoundland was due almost exclusively to an increase in gross in-migration (Panel B) - gross out-migration from Newfoundland between 1966-71 and 1971-76

TABLE I-3

Patterns of Interprovincial Migration: Newfoundland
1961-66, 1966-71 and 1971-76

Destination	Quinquennium 1961-66	1966-71	1971-76
		(A) Out-Migration	
1) Other Atlantic Provinces	12,717	12,896	15,968
2) Quebec	6,210	5,955	5,460
3) Ontario	24,258	38,027	31,713
4) Western Canada (+Yukon,NWT)	4,788	6,047	10,093
5) Total Out-Migration	47,973	62,926	63,232
		(B) In-Migration	
1) Other Atlantic Provinces	10,752	11,549	13,417
2) Quebec	6,695	6,520	5,399
3) Ontario	11,686	21,576	35,572
4) Western Canada (+Yukon,NWT)	3,626	3,937	6,985
5) Total In-Migration	32,759	43,582	61,375

Destination	Quinquennium 1961-66	1966-71	1971-76	Percentage Change 1966-71 / 1961-66	1971-76 / 1966-71	1971-76 / 1961-66
		(C) Gross Migration				
1) Other Atlantic Provinces	23,469	24,445	29,385	4.16	20.21	25.21
2) Quebec	12,905	12,475	10,859	-3.33	-12.95	-15.85
3) Ontario	35,944	59,603	67,285	65.82	12.89	87.19
4) Western Canada (+Yukon/NWT)	8,414	9,984	17,078	18.66	71.05	102.97
5) Total	80,732	106,508	124,607	31.93	16.99	54.35
		(D) Net Migration				
1) Other Atlantic Provinces	-1,965	-1,347	-2,551			
2) Quebec	485	565	-61			
3) Ontario	-12,572	-16,451	3,859			
4) Western Canada (+Yukon/NWT)	-1,162	-2,110	-3,108			
5) Total	-15,214	-19,344	-1,857			

Source & Notes: Panel C = Panel A + Panel B. Panel D = Panel B - Panel A.
Statistics Canada, *International and Interprovincial Migration in Canada*, (Cat. 91-208 Annual).

remained almost constant (Panel A). Finally between 1961-66 and 1971-76 the largest increase in gross interregional population movement (in- plus out-migration between a given region and Newfoundland) was between Newfoundland and Western Canada, although in gross migration terms the flows between Ontario and Newfoundland dominated all other such exchanges between this province and the rest of Canada.

An Econometric Analysis of the Determinants of Gross In- and Out-Migration for Newfoundland

The previous section set out a general description of interprovincial population movements, focussing especially on gross in- and out- population movements to Newfoundland. To explore the determinants of these annual in- and out-migration movements to Newfoundland we tested several regression equations. The results of the best equations are reported below. The variables used in these tests are defined and sourced in the Appendix to Chapter IV. All results reported below cover the period 1962 to 1978.

A large and impressive body of extant empirical studies on the determinants of population movement suggest that relative wages (WDIFF) and relative unemployment rates (UDIFF), where the relatives are the Newfoundland measures relative to Ontario, are important explanatory variables in migration equations. These two variables were used extensively in our regression work. In addition we tested the separate effect of the Ontario unemployment rate (OUNRATE) and the Newfoundland unemployment rate (NUNRATE) on migration to and from this province. Our expectation was that if wages in Ontario rose relative to those in Newfoundland, out-migration to the latter would increase and in-migration from Ontario to Newfoundland would decline. A similar response is expected if the Newfoundland unemployment

rate rose faster than the unemployment rate in Ontario. To study the effect of a change in the number employed in each province we tested for this effect by including the Ontario employment (OEMPL) and Newfoundland employment (NEMPL) as well as changes in these variables. Here the expectation is that an increase in the number of people employed in Ontario (a proxy for expanding employment opportunities) will induce a larger out-flow from Newfoundland to Ontario. Similarly an increase in the number employed in Newfoundland might be expected to induce migration towards this province.

Three other variables were tested in our migration equations. The first is birth levels lagged 16 years (BIRTH16). The hypothesis is that an increase in total births a decade and a half earlier influences the rate at which new labour force entrants appear on the market. A sudden increase in new entrants, all other things equal, might be expected to induce an increase in out-migration. In addition to changes in birth levels we decided to test the effects on migration of the flow of total federal transfers per capita to Newfoundland (TRANPOP). The contention here is that increased transfer payments reduce the local tax burden on residents and hence increase real income. Courchene has suggested that these payments are an important impediment to out-migration from low wage high unemployment regions.[2] The effect on in-migration is expected to be positive; that is, such payments may increase in-migration. The third variable tested was the effect on migration of a change in the ratio of unemployment insurance benefits paid relative to average wages (UCBAWW). The latter is often referred to as the "benefit replacement ratio". As in the case of the transfer payments, an increase in this ratio is expected

to reduce out-migration and increase in-migration, especially in a region experiencing high levels of unemployment.

Out-Migration (GOM)

Different combinations of the variables discussed above were tested on annual out-migration from Newfoundland. We grouped such variables as wage and unemployment differences with lagged birth levels and with the Ontario unemployment rates. In addition total per capita transfer payments and the benefit replacement ratio were added to the regression equations. The best results were obtained with the following relationship. The figures in the brackets and for all other equations, are t-statistics.

(1) $$GOM = \underset{(-2.24)}{36{,}761} - \underset{(-2.06)}{43{,}480}\ WDIFF + \underset{(2.54)}{.00879}\ OEMPL - \underset{(-0.84)}{807}\ BIRTH16$$

$$D.W. = 2.29$$

$$\bar{R}^2 = 0.42$$

$$F\ stat = 4.390$$

The influence of time on the decision to migrate, that is, lagging some of the variables, was not tested. Even in the absence of time effects on migration, the results are most encouraging. With the exception of lagged birth levels (which is not statistically significant), the other two variables have the expected sign and are statistically significant (for n = 15). Equation (1) indicates that when Ontario employment and lagged birth levels are held constant a 10% increase in the relative wages (i.e., a 10% increase in Newfoundland's nominal wage relative to that in Ontario)

reduces out-migration by approximately 4300. Given that the out-migration was approximately 12,600 a year over the last decade this is an impressive reduction. If we perform a similar exercise only this time on the Ontario employment variable we find that when the latter rises by 1000 out-migration increases by only nine persons.

It is worth noting that a number of variables appeared to have no significant influence on out-migration. These include the following: unemployment rate differences between Newfoundland and Ontario; unemployment insurance benefit replacement ratio; changes in the level of Ontario unemployment; and federal per capita transfers to Newfoundland.

In-Migration (GIM)

The tests on the determinants of in-migration proved more satisfactory. We ran approximately the same variables as for out-migration except we added the Newfoundland employment change and the Newfoundland unemployment rate. It proved impossible to choose a demonstrably superior result out of all our runs, so we selected the three best. These are shown below.

(2) $$GIM = \underset{(-2.56)}{-31{,}452} + \underset{(3.11)}{43{,}963}\ WDIFF + \underset{(2.62)}{7839}\ TRANPOP$$

$$D.W. = 1.696$$

$$\bar{R}^2 = 0.626$$

$$F\text{-stat} = 9.207$$

$$N = 14$$

(3) $$GIM = -13901 + 18{,}827\ WDIFF \quad (-1.41)\ (1.45)$$
$$- 268\ NUNRATE + 29{,}984\ UCBAWW \quad (-2.47)\ (4.08)$$
$$D.W. = 1.817$$
$$\bar{R}^2 = 0.788$$
$$F\ Stat = 13.598$$
$$N = 15$$

(4) $$GIM = -41{,}013 + 56{,}869\ WDIFF \quad (-2.49)\ (2.79)$$
$$- 135\ NUNRATE + 7{,}215\ TRANPOP \quad (-0.88)\ (2.33)$$
$$D.W. = 1.88$$
$$\bar{R}^2 = 0.549$$
$$F\ stat = 6.28$$

The regression results on the determinants of in-migration are mixed. Relative wages between Ontario and Newfoundland apparently play an important role in determining the timing of in-migration. In the three equations reported the coefficient for relative wages in each case was positive and in two of the three cases it was statistically significant (equations (2) and (4)). Thus a rise in Newfoundland's average wage relative to Ontario induces an increase in gross in-migration to Newfoundland. In equation #4 a 10% increase in the wage difference holding the other two variables constant induces approximately 6,000 more migrants to enter the province. If we couple this with the similar exercise done above for out-migrants, we begin to get some appreciation for the factors which have reduced net out-migration from Newfoundland so dramatically over the

last decade - a period when wage parity between this province and Ontario occurred.

The role of unemployment is unclear. In equation (3) it enters with the correct sign and is statistically significant. However, although the sign remains negative in equation 4, when total per capita transfers is added, it is not statistically significant. In other tests this variable did not prove to be statistically significant, although it appeared with a negative coefficient. In all cases for out-migration unemployment, either used alone or as a ratio, did not prove to be statistically significant. At this stage of our inquiry, then, changes in the unemployment rate do not appear to have a pronounced influence on in- or out-migration to the province.

The two income transfer variables measured by federal per capita transfers and the ratio of unemployment insurance payments to average weekly wages have the expected sign and are statistically significant determinants of gross in-migration to Newfoundland. Recall that in the equation for out-migration these variables were not statistically significant. At this stage then changes in these two variables do not appear to reduce out-migration but exert some effect on gross in-migration. The impact of government transfer payments on population movements needs a much closer examination before any definite conclusions can be made on whether they affect the efficiency of migration; that is, tend to reduce out-migration from low wage high unemployment regions or conversely attract labour to such regions.

The overall conclusion of this econometric analysis of the determinants of gross migration flows is that wage differences play an important role; unemployment (contrary to some other studies) plays a small role, if any, and transfer payments and unemployment insurance seem to influence in-migration more than out-migration. It can be taken, with some confidence, that market forces do play a role in determining the timing and volume of gross migration flows to and from Newfoundland.

The main purpose of this study, however, is to examine the implications of these flows on the well being of the residents of Newfoundland. Consequently Chapters II, III and IV will be concerned with the implication of first gross and then net flows on the economy in Newfoundland.

Footnotes to Chapter I

1. Leroy Stone, *Canadian Regional Planning and Development in Transition* (School of Urban and Regional Planning, Queen's University, 1976), p. 51.

2. T. Courchene, "Inter-provincial Migration and Economic Adjustment", *Canadian Journal of Economics*, III, No. 4 (Nov. 1970), pp. 550-576.

CHAPTER II

The Characteristics of Migrants

Introduction

The main findings in the previous chapter on the patterns of gross in- and out-migration to Newfoundland over the past decade are, from an economist's point of view, most interesting. Neo-classical economic theory suggests that in the case of a low income, high unemployment region like Newfoundland part of the adjustment process to correct inequities with the rest of Canada comes from a large net outflow of population. The actual events here are significantly different. Net out-migration has declined sharply between the mid-sixties and the mid-seventies, and this has been caused, in the main, by an acceleration of in-migrants to the province. Larry Sjaastad, in a path-breaking article on the subject of the costs and returns to migration,[1] found the same type of population movement into Mississippi in the 1940's and 1950's. For Sjaastad, as for us, the observation that large gross flows in one direction is the best predictor of gross flows in the opposite direction is something that economists must come to grips with in their analysis of the role of migration in equalizing inter-regional income differences.

Over the three quinquennium periods shown in Table I-3, the ratio of net to gross migration was as follows:

1961-66	18.8
1966-71	18.1
1971-76	1.5

By way of comparison Sjaastad indicated that a similar ratio for the state of Mississippi, for one year, was 9.2%.[2] The conclusion is straightforward - an analysis of migration in the regional adjustment process might be better serviced via a study of gross migration rather than net migration (the latter is used exclusively in Chapter IV). Thus, one might hypothesize that it would take a substantial decrease in income in the depressed region to increase net out-migration to a level sufficient to offset completely the natural increase in the local labour force; that is, to have a significant impact on regional unemployment rates and to have a positive effect on regional wage levels.

The difficulty for the economist arises in trying to explain the gross in-migration to a low income, high unemployment region. Most migration studies have been concerned with the determinants of migration (timing, volume and direction) and have established, in the course of such investigations, that net migration, in the main, flows from low to high income regions. How, then, does one interpret the motives for large gross inflows to Newfoundland, especially when large outflows are occurring at the same time. The first explanation, analogous to what has been happening in the American South, is that a skill imbalance exists in the Newfoundland labour force. New jobs coming available require skills that in the short run can only be met by in-migration. At the same time relatively unskilled local workers cannot find employment and so leave to take up jobs or acquire skills elsewhere. According to this view in-migrants are not native Newfoundlanders. An alternate explanation is that the inflow is composed of return migrants who left at an earlier time to acquire skills and/or education. In this case large outflows in one period would give rise to large inflows at a later period.

Yet another source of the large inflows are returnees returning home either to retire or simply to accept a lower wage. If we accept that the large inflows are primarily due to the first two explanations then two-way gross flows will exert a positive influence on regional income convergence since, if the basic description above is correct, younger, less skilled and so low income earners are replaced by older more skilled, and so higher income members of the labour force. Concentration on net flows therefore may obscure this important aspect by which, in the short run, productivity of human resources in a low income region are increased.

The above conjecture on the determinants and consequences of gross in- and out-migration flows runs counter to the view of this process proposed by Myrdal.[3] Myrdal hypothesized that the flows from a depressed region would be in one direction - out, and would be dominated by the "best and brightest" of the affected community. The result of such exodus would be to make those remaining worse off both in terms of employment opportunities and in terms of increased local tax burdens. At a very local level - a one mill town - this is not an unreasonable view of events (e.g., one need only look briefly at the short, if not exciting, history of early mining towns in the American West). However, for large multi-resource provinces (like Newfoundland), which can experience declining and expanding industries such a one-sided homogenous concept of regional adjustment seems inappropriate. Nonetheless, Myrdal's contention that out-migration (and in-migration?) is a highly selective process seems essentially correct.

A proper analysis of the actual flows of migration involves detailed knowledge of the age, sex, level of schooling and incomes of the migrants.

Indeed a full explanation would include, as well, information on the occupations of migrants. Special tabulations from the 1971 and 1976 Census' provided us with most, but not all of the data required. The 1971 Census provided all of the above evidence except for occupation, and it divided the level of education between those with and those without vocational training. The 1976 Census did not ask a question about incomes and again we did not collect information on occupations.

The purpose of this and the following chapter is to use these data to find out which of the aforementioned alternative hypotheses are best supported by the evidence available. In the following section single variable tables were constructed of the number of migrants by migration status, age, education and labour status. There are four categories of migration status - INS, OUTS, STAYERS and ROC (Rest of Canada). For the 1971 Census these categories are defined by the place of residence in 1971 and 1966. The following table defines these categories:

	Place of Residence 1966	1971
Ins	Not Nfld.	Nfld.
Outs	Nfld.	Not Nfld.
Stayers	Nfld.	Nfld.
ROC	Not Nfld.	Not Nfld.

For the 1976 Census the migration status is similarly determined by place of residence in 1971 and 1976. The age categories are 5-10, 11-15, 16-20, 21-25, 26-35, 36-45, 46-55, 56-65 and 66 and over. These age categories are identical for both census years and refer to the age at the time of

enumeration. Education categories for the 1971 Census are 5 plus years of post secondary education, 3-4 years of post secondary education, 1-2 years of post secondary years of education, 9-13 years of schooling, 5-8 years of schooling and those with less than five years of schooling. For the 1976 Census the categories are 3 plus years of post secondary years of education, 1-2 years of post secondary years of education, 9-13 years of schooling, 5-8 years of schooling and those with less than 5 years of schooling. In the 1971 Census education was further sub-divided into those with and those without vocational training. The labour force status is partitioned into those less than 15 years of age, those employed, those unemployed and those not in the labour force. Finally the migrant and non-migrant population in the 1971 Census can be partitioned into those born in Newfoundland and those born elsewhere. Data were collected on this basis and are reproduced in separate tables in this and the following chapter.

Single variable tables provide an estimate of the number of migrants and non-migrants by these various characteristics as well as by place of birth for 1971 but not for 1976. In order to secure a multi-variable analysis of the influence of age and education on migration by status a series of regressions were run with the latter forming the dependent variable. These are reported in section 3. This whole exercise was then repeated for the average income of migrants and non-migrants but in this case only for the 1971 Census since income is not available for the 1976 census.

2. Single Variable Analysis

(a) Migration and Age

The economic literature on human migration has established clear patterns of migration behavior in terms of age levels. Using a present value approach, it is clear that the rate of migration (i.e., the number of

migrants in a given age cohort divided by the population in that cohort in the sending or receiving region) should peak at an early age - usually some time during the third decade of an individual's life, and fall off sharply for older ages. The explanation for this peaking is that a potential migrant has a longer remaining working life in which to cover the costs (money and non-money) involved in moving. What has not been adequately documented in the literature is whether the rate of migration peaks at different ages for in- and out-migrants from low income regions.[4]

There is some suspicion, that, indeed the profiles of migration by age may peak differently for the different flows. As suggested earlier, the large gross out- and inflows may be due to an imbalance between the supply and demand for skilled and unskilled. Those members of the local labour force who do not have the requisite skills migrate out while in-migrants with the necessary skills are induced into Newfoundland. If this is what motivates migration then one could argue that the out-migrants with few skills should be on average younger than the more skilled in-migrants. The reason for this is that the individual out-migrant may have to incur not only the normal cost of relocation but also the costs of training. To recover these additional costs would mean ceteris paribus migration at an earlier age than the in-migrants who have already acquired skills.

The alternative interpretation is that in-migrants are mainly return migrants. If this were true one would naturally expect the average age of in-migrants to be greater than that of out-migrants. Furthermore if return migrants are individuals who went out to acquire skills the age differential would be less than if they were returning to Newfoundland to

live partly or wholly off their accumulated savings. Thus all the reasonable hypotheses would lead one to expect that the age of in-migrants is greater than out-migrants and in turn we would expect them to be younger than non-migrants (Stayers).

Tables II-1, II-2 and II-3 set out the percentage distribution of Ins, Outs, Stayers and ROC for 1971 and 1976. The 1971 Census Figures are further divided between those people who were born in Newfoundland and those born elsewhere, i.e. in one of the other provinces or out of the country. The absolute levels of these various categories are recorded in line 14 of each table. Columns 5, 6 and 7, show the differences, respectively, between the shares of Ins and Outs and the percentage distribution of Stayers in Newfoundland (col. 3) and ROC's (col. 4). These differences are a measure of the propensity to migrate among different age cohorts. A positve sign indicates an above average propensity while a negative sign suggests that the particular age group has a below average propensity to migrate relative to the Stayers.

Before commenting on the results, it might be helpful to outline exactly what the migrant component represents. At each of the census dates; i.e., 1971 and 1976, individuals were asked where they resided five years earlier. With the data from Statistics Canada, we were able to group migrants into those who were not residents of Newfoundland in 1966 and 1971 but were in 1971 and 1976 respectively, and those who were not residents of Newfoundland in 1971 and 1976 but were in 1966 and 1971 respectively. These are stock estimates of migration. For 1971, in addition we have estimates by place of birth as described earlier. We do not know how many moves the individual made between 1966 and 1971 or between 1971 and 1976 or how many people moved between these dates and returned to their original residence

TABLE II-1

Percentage Distribution and Differences of MALE In- and Out-Migrants and Non-Migrants in Nfld. (Stayers) and in the Rest of Canada (ROC), Born in Newfoundland, 1971

Age Cohorts	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (3) - Col. (4) (7)
5-10	10.68	13.19	18.03	7.42	-7.35	-4.84	10.61
11-15	6.69	6.40	14.44	5.70	-7.75	-8.04	8.74
5-15	17.25	19.64	32.47	13.13	-15.22	-12.83	19.34
16-20	3.09	17.83	12.45	8.35	-9.36	5.38	4.10
21-25	19.69	32.44	8.68	15.18	11.01	23.76	-6.50
16-25	22.91	50.27	21.12	23.53	1.79	29.15	-2.41
26-35	34.62	18.03	11.93	23.06	22.69	6.10	-11.13
36-45	11.07	5.37	10.56	15.14	0.51	-5.19	-4.58
46-55	6.56	3.27	9.97	10.53	-3.41	-6.70	-0.56
56-65	4.50	2.64	7.72	7.40	-3.22	-5.08	0.32
26-65	56.76	29.31	40.18	56.12	16.58	-10.87	-15.94
66+	3.09	0.78	6.23	7.21	-3.14	-5.45	-0.98
Total	100.01	100.00	100.00	99.99			
Number* 5+	3,885	10,235	215,475	46,540			
Weighted Av. Age	29.99	23.96	29.45	34.30			

* Total number of migrants five years old and over. These are the numbers upon which the percentages in this table were based.

TABLE II-2

Percentage Distribution and Differences of MALE In- and Out-Migrants and Non-Migrants in Nfld. (Stayers) and in the Rest of Canada (ROC), Born Elsewhere 1971

Age Cohorts	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (3) - Col. (4) (7)
5-10	21.23	15.21	10.90	14.07	10.33	4.31	-3.17
11-15	9.24	11.62	11.33	11.81	-2.09	0.29	-0.48
5-15	30.46	26.82	22.32	25.87	8.14	4.50	-3.55
16-20	6.31	9.08	9.20	10.48	-2.89	-0.12	-1.28
21-25	15.01	10.35	6.64	9.26	8.37	3.71	-2.62
16-25	21.40	19.43	15.93	19.74	5.47	3.50	-3.81
26-35	26.38	25.87	15.08	14.44	11.30	10.79	0.64
36-45	13.94	15.95	17.72	13.02	-3.78	-1.77	4.70
46-55	5.42	8.24	14.74	11.24	-9.32	-6.50	3.50
56-65	1.78	2.53	7.84	8.38	-6.06	-5.31	-0.54
26-65	47.51	52.69	55.54	47.08	-8.03	-2.85	8.46
66+	.62	1.27	6.22	7.30	-5.60	-4.95	-1.08
Total	99.99	100.21	100.01	99.99			
Number * 5+	5,630	4,735	5,870	9,574,780			
Weighted Av. Age	25.32	27.60	33.79	32.14			

* Total number of migrants five years old and over. These are the numbers upon which the percentages in this table were based.

TABLE II-3

Percentage Distribution and Differences of Total MALE In- and Out-Migrants, Stayers and Rest of Canada (ROC) by Age, 1976

Age Cohorts	Percentage In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1976 (4)	Differences Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	(7)
5-10	15.90	12.25	15.43	11.07	0.47	-2.93	
11-15	8.15	7.82	13.91	11.36	-5.76	-6.09	
5-15	24.05	19.99	29.33	22.44	-5.28	-9.34	
16-20	5.56	16.93	12.38	11.09	-6.82	4.55	
21-25	13.28	23.28	9.79	9.79	3.49	13.49	
16-25	18.76	40.35	22.17	20.88	-3.41	18.18	
26-35	37.44	21.39	14.47	16.64	22.97	6.92	
36-45	11.76	10.22	10.27	12.38	1.49	-0.05	
46-55	4.33	4.65	9.45	11.55	-5.12	-4.80	
56-65	1.95	2.03	7.99	8.53	-6.04	-5.96	
26-65	55.52	38.25	42.19	49.10	13.33	-3.94	
66+	1.55	1.44	6.31	7.58	-4.76	-4.87	
Total	99.84	100.07	100.00	99.79			
Number * 5+	12,580	13,555	239,175	10,183,745			
Weighted Av. Age	26.93	25.59	30.14	32.95			

* Total number of migrants five years old and over. These are the numbers upon which the percentages in this table were based.

Chart II-1

Percentage Distribution of Male Migrants (Ins and Outs) and Non-Migrants (Stayers), Born in Newfoundland, By Age, 1971

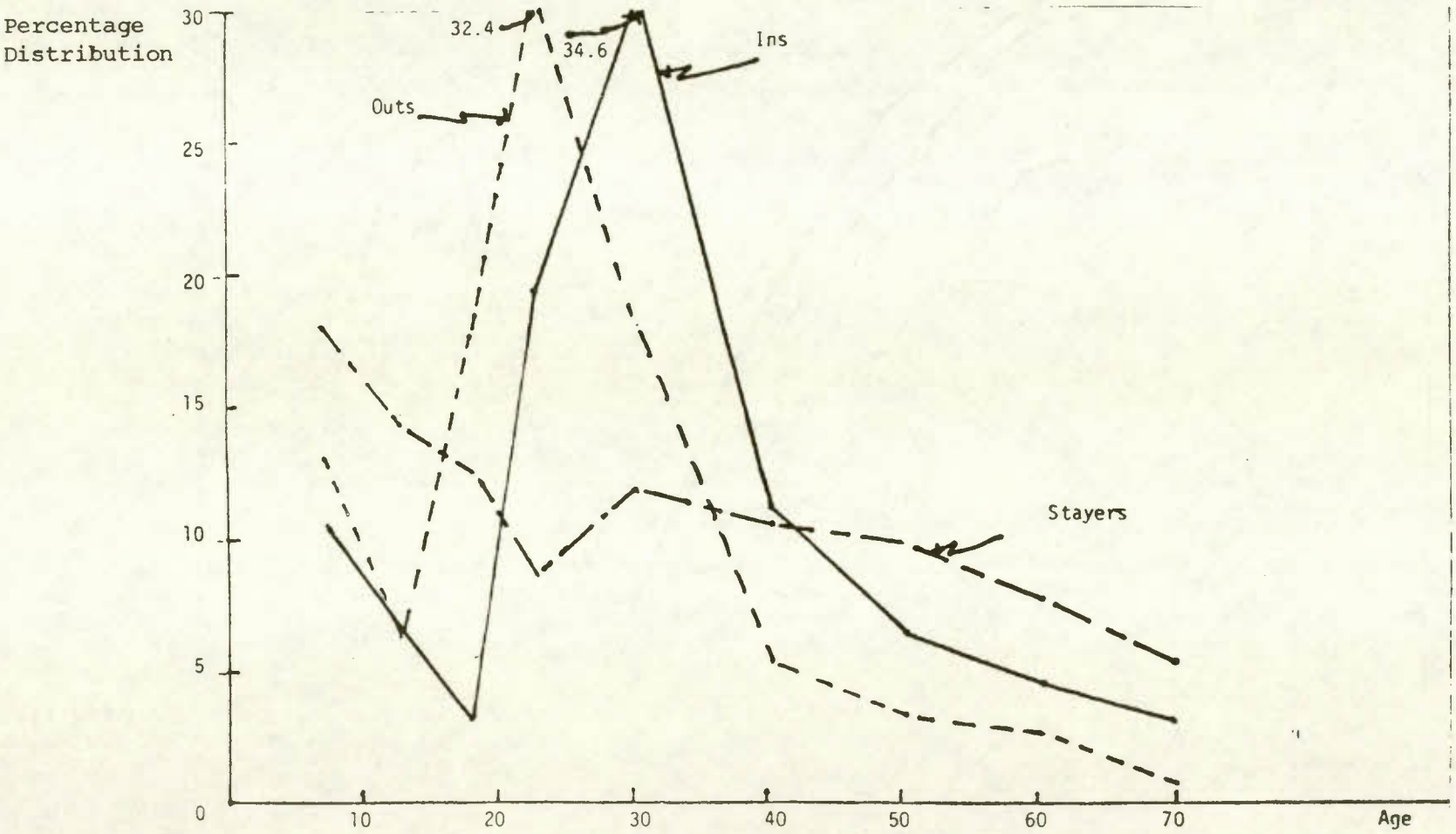
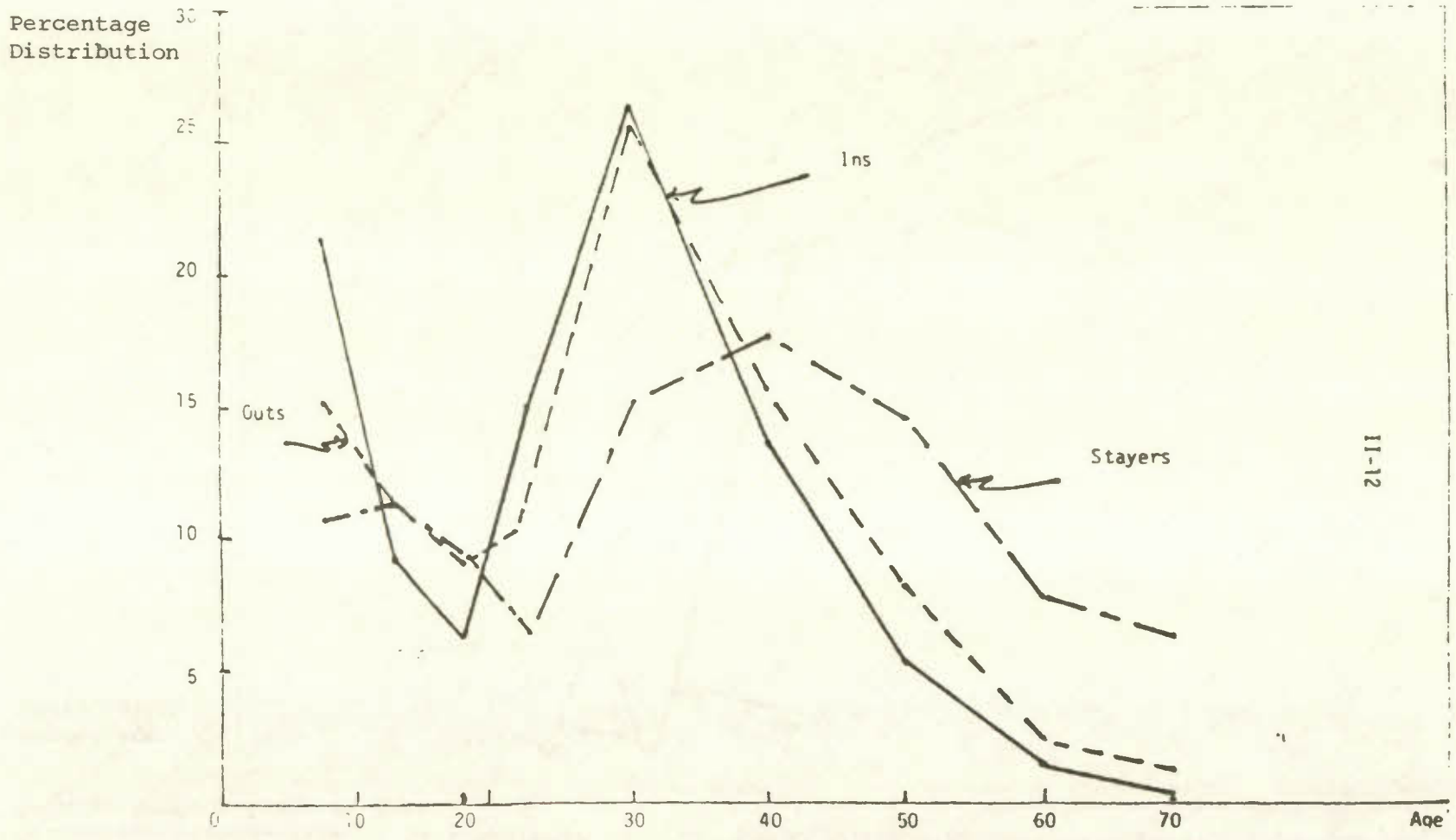


Chart II-2

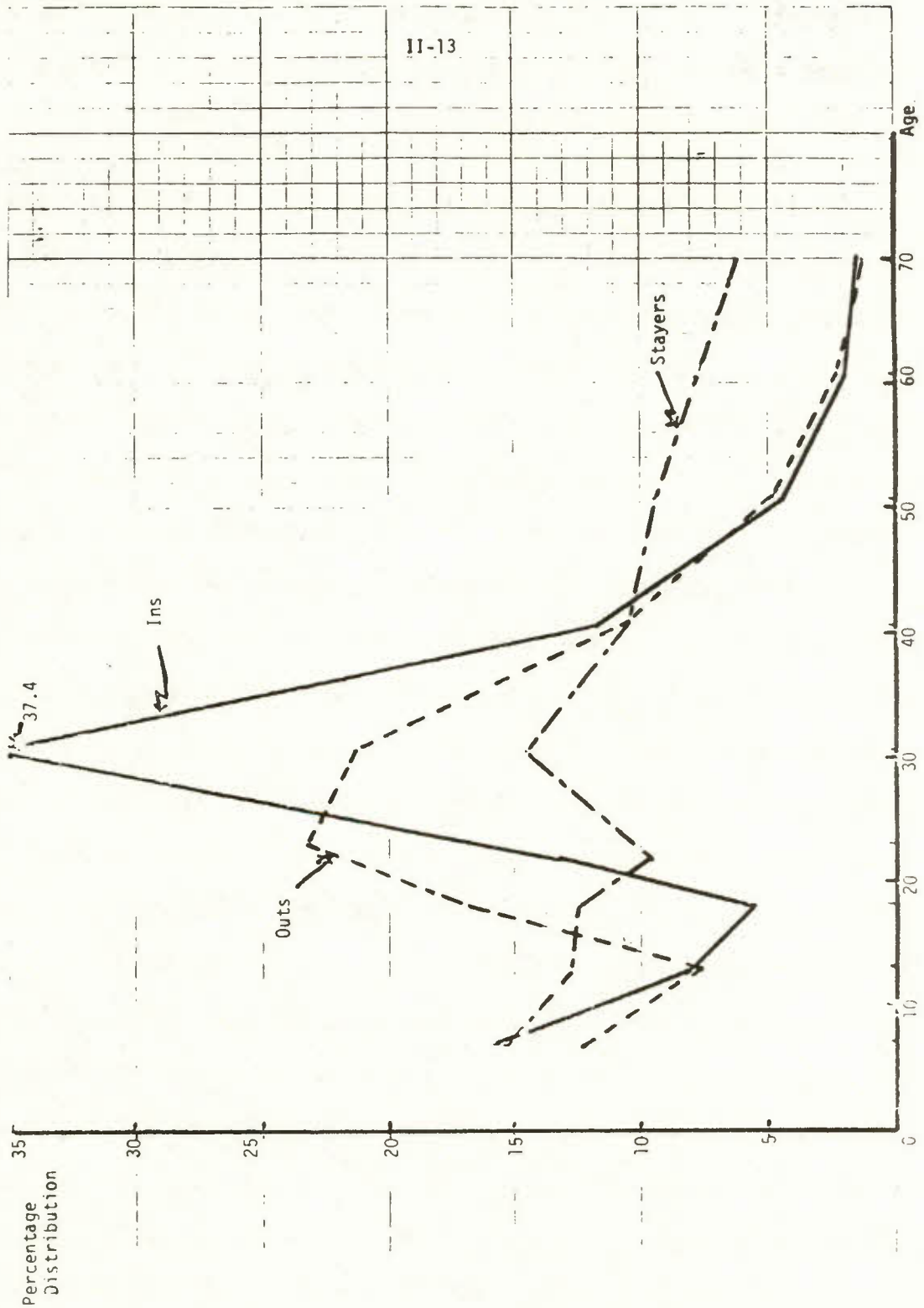
Percentage Distribution of Male Migrants (Ins and Outs) and Non-Migrants (Stayers), Born Elsewhere by Age, 1971



II-12

Chart II-3

Percentage Distribution of Male Migrants (Ins and Outs) and Non-Migrants (Stayers), by Age, 1976



before the time the census was taken. The latter are recorded, therefore, as non-migrants. The in- and outflows are net of all such movements and so represent a downward bias in the total population movement to and from Newfoundland (or any other province).[5]

Several results are revealed in Tables II-1, II-2 and II-3 and Charts II-1, II-2 and II-3. First, the propensity to migrate differs substantially between migrants born in Newfoundland from those born elsewhere in terms of age. Newfoundland born migrants exhibit sharp peaks in migration propensity but with a ten-year spread between those leaving the province (Outs) and those returning (Ins). The out-migrants peak in their late teens or early twenties while the in-migrants peak in their late twenties or early thirties. Those migrants entering and leaving Newfoundland who were not born in the province show a very different pattern (Chart II-2). Both the in- and out-migrants born elsewhere peak at about the same age; i.e., the late twenties and early thirties. Since those not born in Newfoundland were earlier in-migrants this coincidence in the age peaking suggests that their stay in Newfoundland was quite short. Migration by age, as revealed in 1976 Census (Chart II-3 and Table II-3), although not segregated by place of birth, reveals a pattern more closely approximating that shown for Newfoundland born migrants in the 1971 Census with the Ins peaking at a later age than the Outs. Second, in terms of the distribution of migrants by age (Columns (1), (2) and (3) of Tables II-1, II-2 and II-3), the largest age cohorts for those migrants born in Newfoundland are 26-35 for the Ins and 21-25 for the Outs. For those born elsewhere, the largest age cohort for both Ins and Outs is 26-35.

Finally, it is worth noting that only small shares of migrants between 5 and 15 are recorded among migrants born in Newfoundland while for the sub-group of migrants born elsewhere the shares are quite large. For example among the Ins the share for those born in Newfoundland in the 5-15 age bracket is 17.2 while for those born elsewhere it is 30.5. There is some indication, then, that those coming to Newfoundland who were not originally born in the province are migrating in family units rather than as singles or as childless couples.

The overall results of this investigation on age and migration suggest that the pattern is for those migrants born in Newfoundland to leave at a relatively early age in their working careers. For in-migrants the evidence is mixed. The older average age among the latter, for both those born in the province and those born elsewhere, implies that Newfoundland was absorbing migrants with more years of job experience. However,at this stage, it is impossible to say whether those Newfoundland born migrants returning home had acquired more skills during their absence. There is the suspicion that this is correct given the age spread between their departure and return. It is unambiguously true though that those returning to the province have not spent the majority of their working life outside Newfoundland.

(b) Migration and the Level of Education

There are two questions which arise in relation to the propensity of individuals to migrate given that they have different levels of schooling. First, is there a clear association between the level of education and the rate of migration? Second, is there an observable difference between the level of education attainment of in- and out-

migrants? In particular is there any support for the contention that migration is primarily a means by which Newfoundlanders acquire human capital?

The first question has been examined widely in the literature on human migration. The presumption is that a positive association exists between the propensity to migrate and the level of education. The reasons why people with more schooling should be more willing to move include: greater absolute income gains; more information on alternative job prospects (i.e., income, job availability, working conditions, etc.); lower cost of transportation relative to income; and lower psychic costs of moving.[6] The discovery of a positive association is important since the Myrdal hypothesis rests on the assumption that out-migrants tend to be among the highly educated members of the region. According to this view migration drains off the most productive members of society and hence contributes to its underdevelopment.

Whereas the Myrdal hypothesis concentrates on the loss of human capital through out-migration, it is possible that the gain in human capital associated with in-migration offsets the loss through out-migration. Whether or not Newfoundland is a net gainer or loser from this exchange is an empirical question. There is no well established body of literature to provide clear predictions. However, as suggested in the previous section on age and migration, there is a tendency for Newfoundland-born out-migrants to be younger than in-migrants. It might well be the case that this age differential reflects different levels of educational investment; i.e., out-migrants with fewer years of formal instruction than in-migrants. A reasonable working hypothesis is that, given the

differential in peak age of migration (between in- and out-migrants), it is expected that the out-migrants' observed level of educational attainment is less than what it is for in-migrants. It is also interesting to see how the level of schooling differs between in- and out-migrants who were not born in the province.

Tables II-4, II-5, II-6, II-7 and II-8 show the percentage distribution of Ins, Outs, Stayers, and ROC's by six levels of education attainment and by place of birth for 1971 and five levels for 1976. In addition it was possible to disaggregate the 1971 population not only by place of birth but into those with and those without vocational training. To simplify the discussion we will focus on the 1971 results first, and then draw comparisons at the end of this section between these findings and those for 1976. The evidence lends some support to the contention that a positive association may exist between the level of education and the propensity to migrate whether or not the individual has vocational training.

Tables II-4, II-5, II-6, II-7 and II-8 show the percentage distribution of Ins, Outs, Stayers, and ROC's by six levels of education attainment and by place of birth for 1971 and five levels for 1976. In addition it was possible to disaggregate the 1971 population not only by place of birth but into those with and those without vocational training. To simplify the discussion we will focus on the 1971 results first, and then draw comparisons at the end of this section between those and the 1976 findings. The evidence lends some support to the contention that a positive association may exist between the level of education and the propensity to migrate whether or not the individual has vocational training.

TABLE II-4

Percentage Distribution and Differences of Total MALE Migrants, Stayers and ROC by Level of Schooling With Vocational Training, Born in Newfoundland, 1971

Level of Schooling	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (1) - Col. (2) (7)
5+ Post Sec.	2.92	1.79	.70	1.72	2.22	1.09	1.13
3-4 Post Sec.	8.03	7.16	11.24	12.50	-3.21	-4.08	.87
1-2 Post Sec.	45.99	51.64	43.11	38.72	2.88	8.53	-5.65
9-13	36.50	33.73	35.73	36.42	.77	-2.00	2.77
5-8	6.57	5.07	8.49	9.41	-1.92	-3.42	1.50
<5	-	.60	.73	1.22	-.73	-.13	-.60
Total	100.01	99.99	100.00	99.99			
Number 5+ *	685	1,675	14,370	6,960			

*-Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-5

Percentage Distribution and Difference of Total MALE Migrants, Stayers and ROC by Level of Schooling WITH Vocational Training, Born Elsewhere, 1971

Level of Schooling	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (1) - Col. (2) (7)
5+ Post Sec.	7.33	1.52	4.32	2.24	3.01	-2.80	5.81
3-4 Post Sec.	20.94	15.15	22.70	20.25	-1.76	-7.55	5.79
1-2 Post Sec.	31.94	41.92	31.35	29.94	.59	10.57	-9.98
9-13	37.70	36.36	33.51	34.23	4.19	2.85	1.34
5-8	2.09	5.05	7.57	12.35	-5.48	-2.52	-2.96
<5	-	-	.54	.98	-.54	-.54	-
Total	100.00	100.00	99.99	99.99			
Number * 5+	955	990	925	1,115,825			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-6

Percentage Distribution and Difference of Total MALE Migrants, Stayers and ROC by Level of Schooling WITHOUT Vocational Training, Born in Newfoundland, 1971

Level of Schooling	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (1) - Col. (2) (7)
5+ Post Sec.	7.66	3.27	1.20	3.18	6.46	2.07	4.39
3-4 Post Sec.	3.59	2.45	1.49	2.78	2.10	.96	1.14
1-2 Post Sec.	6.25	5.48	3.19	4.86	3.06	2.29	.77
9-13	37.19	43.85	26.33	42.70	10.86	17.52	-6.66
5-8	26.72	26.59	35.62	31.32	-8.90	-9.03	.13
<5	18.59	18.37	32.18	15.15	-13.59	-13.81	.22
Total	100.00	100.01	100.01	99.99			
Number 5+ *	3,200	8,575	201,095	39,575			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-7

Percentage Distribution and Difference of Total MALE Migrants, Stayers and ROC by Level of Schooling WITHOUT Vocational Training, Born Elsewhere, 1971

Level of Schooling	Percentage				Differences		
	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (1) - Col. (2) (7)
5+ Post Sec.	15.29	7.33	9.79	3.15	5.50	-2.46	7.96
3-4 Post Sec.	9.41	6.80	6.16	4.55	3.25	.64	2.61
1-2 Post Sec.	8.34	8.40	6.56	5.53	1.78	1.84	-.06
9-13	27.59	38.40	38.45	34.36	-10.86	-.05	-10.81
5-8	14.55	20.13	22.70	31.95	-8.15	-2.57	-5.58
<5	24.81	18.93	16.35	20.46	8.46	2.58	5.88
Total	99.99	99.99	100.01	100.00			
Number 5+ *	4,675	3,750	4,955	8,458,960			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-8

Percentage Distribution and Differences of Total
MALE Migrants, Stayers and ROC, 1976,
by Level of Schooling

Level of Schooling	Percentage In Migrants (1)	Percentage Out Migrants (2)	Percentage Stayers (3)	Percentage R.O.C. 1976 (4)	Differences Col. (1) - Col. (3) (5)	Differences Col. (2) - Col. (3) (6)	Differences Col. (1) - Col. (2) (7)
3+ Post Sec.	25.99	18.75	8.69	16.84	17.30	10.06	7.24
-	-	-	-	-	-	-	-
1-2 Post Sec.	22.59	22.46	14.80	15.28	7.79	7.66	0.13
9-13	35.82	44.33	35.82	41.86	0.00	8.51	-8.51
5-8	13.18	12.88	27.76	20.94	-14.58	-14.88	0.30
<5	2.42	1.58	12.93	5.07	-10.51	-11.35	0.84
Total	100.00	100.00	100.00	99.99			
Number 5+ *	9,715	11,065	175,965	8,139,585			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

This can be seen by observing the differences between Ins and Outs and the Stayers who have the same level of educational training. We find that the proportion of the migrating population (Ins and Outs) who have grade 9 or higher years of schooling is higher than for Stayers. Conversely for those with less than a grade 9 level of education the proportions are the reverse. Apart from this break at grade 9 there does not appear to be any systematic relationship between differences in the shares of population between migrants and non-migrants and levels of education. This relationship holds for both those migrants born in Newfoundland and those born elsewhere.

The presence or absence of vocational training has some interesting effects on migration propensities. In the case of migrants without vocational training, the differences between migrants and non-migrants is much greater for those born in Newfoundland, especially for those with only public school training (i.e., less than 8 years of formal education). Note, for example, the large negative differences which appear in columns (5) and (6), rows (5) and (6) of Table II-6. Apparently vocational training increases the mobility potential of those with less formal education. Part of this difference can be accounted for by the fact that the category without vocational training includes most of the population under 15 years of age. We saw in the last section that their propensity to migrate was quite low.

On the other hand the differences between migrants and non-migrants tend to be much smaller for those with vocational training. The effect is to reduce mobility of those with higher levels of education, while at the same time increasing mobility for those with primary schooling only, at least for native Newfoundlanders. Thus the role of vocational training in labour market adjustment needs more study especially its differential effect on mobility

between those with advanced training and those who terminate formal education after primary school.

Column 7 in Tables II-4, II-5, II-6, II-7 and II-8 compares the distribution of Ins and Outs by educational level. It is apparent that for 1971 the proportion of university educated persons is higher for in-migrants than for out-migrants; the proportion of those with primary is mixed for out-migrants than for in-migrants; and for those with high school education the results are mixed for those with vocational training but the share of the Outs exceeds the Ins for those without vocational training. Not only are the proportions of those with 3 or more years of post secondary education higher for in- than for out-migrants but the absolute numbers are as well. There are 1,859 in-migrants who have three or more years of university education but only 1,335 out-migrants (these numbers are calculated by applying the appropriate proportions in columns (1) and (2) of Tables II-4, II-5, II-6 and II-7 to the total number of migrants as shown in line 8). For those with vocational training there is a higher proportion of in-migrants with 9-13 years of schooling than is the case for out-migrants, while the opposite holds for those without vocational training. However, if one calculates the percentage of in-migrants and out-migrants who have vocational training one gets about 17% for both, thus there does not seem to be a clear tendency overall for out-migrants to be proportionately more dominated by those with vocational training than it is for in-migrants.

Turning to the results for 1976, those with some high school education are relatively more important among out-migrants than among in-migrants. For migrants with 3 or more years of university education proportionately more are in-migrants than are out-migrants. Indeed, not

only are there proportionately more in-migrants than out-migrants with three plus years of post secondary education but the absolute number of in-migrants (.2599 x 9715 = 2525) exceeds the absolute number of out-migrants (.1875 x 11.065 = 2075). For the other three categories of education the proportions are the same for in- and out-migrants.

The general picture which emerges is that proportionately more migrants have higher levels of education than do non-migrants (Stayers). Within the migrating population the distribution by education level tends to be skewed towards higher education relative to that for out-migrants. As in the case of the age distribution of migrants this pattern is consistent with two views of the migration process. In-migrants might either be those returning to Newfoundland (about 55% of in-migrants were Newfoundland born) who acquired new skills while living elsewhere or these returnees might simply be those unable to find jobs elsewhere. For the other segment of this in-migration; i.e., the 45% not born in Newfoundland, it is more likely that the majority are bringing skills not available in the province. In any case the human capital exchange involved in migration does not appear to be unfavourable to the Newfoundland economy. As Tables II-4, II-5, II-6, II-7 and II-8 indicate, between 1971 and 1976 the gap between total in- and out-migrants was declining (see line 8). This is due primarily to a decrease in out-migration. Although the basic mobility patterns remain unaltered; i.e., positive signs for those with post-secondary education (relative to the non-migrant population in Newfoundland), and negative signs for those with only public school education, the main effect is to change the province from being a net exporter of talent (gross absolute outflow of the highly trained exeeed the gross absolute inflow - columns (1) and (2), rows (1), (2) and (3), Tables II-4, II-5, II-6 and II-7) to being a net importer (4,718 in-migrants with post-secondary education vs. 4,560 out-migrants) in the early seventies.

Another way to view the data on the distribution of migrants by education level is to investigate how the levels of in- and out-migration over the five year periods, 1966 to 1971 and 1971 to 1976, influence the distribution of the Newfoundland population.[7] We can calculate the distribution of the total Newfoundland population by education level for each census year by summing the number of Stayers and the Ins by each education category. Let us call this aggregate the post-migration population. Similarly we can calculate what the population distribution would have been in the absence of the migration which occurred over the previous five years. This is done by adding the Outs to the Stayers. This aggregate will be called the pre-migration population.

The results of these calculations are shown in Tables II-9, II-10 and II-11 for 1971 and 1976 respectively. These tables record the percentage distribution of the Newfoundland population by education level for those with and without vocational training and also the aggregate. The final columns (7-9), show the differences in the change in the proportion of the population for each education level as a result of migration.

This exercise in comparing the percentage distribution of the Newfoundland population, by education level, reveals that the proportions of people in these education categories are changed only slightly after one has accounted for all of the additions and subtractions due to migration. Thus the differences between pre- and post-migration shares by years of schooling for totals (col. 9) range from a low of -.01 (Table II-9) to a high of -4.23 (Table II-10). However the pattern of shares between different levels of education

TABLE II-9

Percentage Distribution and Differences of Males by Level of Schooling (With and Without Vocational Training), Born in Newfoundland, 1971

Level of Schooling	Pre-Migration			Post-Migration			Differences		
	With (1)	Without (2)	Total (3)	With (4)	Without (5)	Total (6)	With (7)	Without (8)	Total (9)
5+ Post Sec.	0.81	1.28	1.25	0.81	1.30	1.26	0	.02	.01
3-4 Post Sec.	10.81	1.53	2.19	11.28	1.52	2.18	.47	-.01	-.01
1-2 Post Sec.	44.00	3.28	6.18	43.97	3.24	5.99	-.03	-.04	-.19
9-13	35.53	27.04	27.65	34.68	26.50	27.05	-.85	-.54	-.60
5-8	8.13	35.26	33.33	8.54	35.49	33.66	.41	.23	.33
<5	0.72	31.61	29.41	0.71	31.97	29.85	-.01	.36	.44
Total	100.00	100.00	100.01	99.99	100.02	99.99			
Number 5+ *	16,045	209,670	225,715	14,805	204,295	219,100			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-10

Percentage Distribution and Differences of Males by Level of Schooling (With and Without Vocational Training), Born Elsewhere, 1971

Level of Schooling	Pre-Migration			Post-Migration			Differences		
	With (1)	Without (2)	Total (3)	With (4)	Without (5)	Total (6)	With (7)	Without (8)	Total (9)
5+ Post Sec.	2.87	8.73	7.67	5.85	12.46	11.38	2.98	3.73	3.71
3-4 Post Sec.	18.80	6.43	8.66	21.81	7.74	10.03	3.01	1.31	1.37
1-2 Post Sec.	36.81	7.35	12.66	31.65	7.42	11.38	-5.16	.07	-1.28
9-13	34.99	38.43	37.81	35.64	33.18	33.58	.65	-5.25	-4.23
5-8	6.27	21.60	18.83	4.79	18.74	16.46	-1.48	-2.86	-2.37
<5	0.26	17.46	14.36	0.27	20.46	17.16	.01	3	2.8
Total	100.00	100.00	99.99	100.01	100.00	99.99			
Number 5+ *	1,915	8,705	10,620	1,880	9,630	11,510			

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

TABLE II-11

Percentage Distribution and Differences of Males by Level of Schooling (With and Without Vocational Training), 1976

Level of Schooling	Pre-Migration (1)	Post-Migration (2)	Difference (3)
3 + Post Sec.	9.29	9.59	.30
1-2 Post Sec.	15.25	15.21	-.04
9-13	36.32	35.82	-.50
5-8	26.88	27.00	.12
<5	12.26	12.38	.12
Total	100.00	100.00	
5+ *	187,030	185,680	

* Total number of migrants with five or more years of education. These are the numbers upon which the percentages in this table were based.

is quite interesting. For those with three or more years of post secondary education in 1971 the difference between pre and post migration shares is positive, for those not born in Newfoundland and about even for those born in the province: Newfoundland has been a net gainer of highly trained manpower. Net losses in relative shares of population are recorded for those with high school and one to two years of post secondary schooling. The province also gains in the two-way flow of migrants born in Newfoundland with less than eight years of formal training. The 1976 results (Table II-11) reveal the same basic change - positive differences between pre and post migration population distributions for those with three or more post secondary years of schooling. A positive relative net gain appears also in the categories with less than eight years of schooling. The main area of relative decrease is in 9-13 and 1-2 years of post secondary years of schooling. Finally between the 1971 and 1976 periods there has been a sharp drop in the absolute outflow (i.e., 5,725 = 230,610 - 236,335 for the 1971 results to 1,350 = 187,030 - 185,680 for 1976). This decrease, it should be noted was not accompanied by a major change in the relative differences between pre and post migration populations.

3. Migration and Labour Force Status

The four labour status categories - less than 15 years of age; employed, unemployed; and not in the labour force represent the status of the population at the time the census was taken. For our purposes we would have been interested to know what the labour force status was at the time of migration. Nonetheless these data shed some light on the consequences of migration. For example, for in-migrants the finding that a large proportion are unemployed would suggest that many of these migrants

are returnees who have either come back to collect UIC benefits or other income transfers or are those who were unable to secure satisfactory employment elsewhere; i.e., the return migrants include a large number of failures. If so the migration process could be inefficient. Similarly for out-migrants the discovery that unemployment rates are low relative to the Stayers would suggest that these people are leaving to seek employment opportunities outside the province.

Tables II-12, II-13 and II-14 set out the absolute number and percentage distribution of Ins, Outs, Stayers and ROC by labour force status for each of the two census years. The 1971 figures are further divided into those born in Newfoundland (Table II-12) and those born elsewhere (Table II-13). Columns 5 and 6 give us some indication of the differences in labour force status between migrants and non-migrants. There is strong evidence from this comparison that a larger percentage of migrants are employed than are non-migrants especially for those born in the province while the percentages of unemployed are higher for the latter. This is true whether we calculate the percentage unemployed as a proportion of total relevant population or as a proportion of the labour force (E + U). Also the proportion of Newfoundland born migrants who are labour force participants (E+U) is considerably higher than for non-migrants and the opposite holds for those not seeking employment (<15 + N). Comparing out-migrants with the population with which they reside (ROC), a similar pattern emerges as indicated by Column 7; i.e., a larger proportion is employed and a smaller proportion is either less than 15 or are not in the labour force.

What do these findings indicate? First, migration is relatively efficient. According to these results a larger proportion of migrants find jobs than in the resident population of either the sending or the receiving regions. Migration, then, can be viewed as a way of closing unemployment gaps. Second,there is no support for the contention that in-migrants are

TABLE II-12

Percentage Distribution and Differences of Total (5+) Male Migrants, Stayers and ROC, Born in Newfoundland, by Labour Force Status, 1971

Labour Force Status	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (3) - Col. (4) (7)
L15 **	635	1,885	63,830	5,585	-	-	-
E	2,210	7,165	86,805	32,480	-	-	-
U	340	475	10,020	2,160	-	-	-
N	695	710	54,820	6,310	-	-	-
TOTAL	3,885	10,235	215,475	46,540	-	-	-
			Percentages				
L15	16.34	18.42	29.62	12.00	-13.28	-11.2	17.62
E	56.89	70.00	40.29	69.79	16.6	29.71	-29.5
U	8.75	4.64	4.65	4.64	4.1	-0.01	0.01
N	17.89	6.94	25.44	13.56	-7.55	-18.5	11.88
TOTAL	99.87	100.00	100.00	99.99	-	-	-
$\frac{U}{E+U}$	0.133	0.062	0.103	0.062	-	-	-
Participation Rate	78.6	91.5	63.9	84.6			

** L15 means less than 15 years old.

TABLE II-13

Percentage Distribution and Differences of Total (5+) Male Migrants, Stayers and ROC, Born Elsewhere, by Labour Force Status, 1971

Labour Force Status	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1971 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (3) - Col. (4) (7)
L15 **	1,650	1,160	1,175	2,255,815	-	-	-
E	3,370	2,935	3,605	5,192,145	-	-	-
U	155	185	170	411,600	-	-	-
N	455	455	910	1,715,220	-	-	-
TOTAL	5,630	4,735	5,870	9,574,780	-	-	-
			Percentages				
L15	29.30	24.50	20.02	23.56	9.28	4.48	-3.54
E	59.86	61.99	61.41	54.23	-1.55	.58	7.18
U	2.75	3.91	2.90	4.30	-0.15	1.01	-1.4
N	8.08	9.61	15.50	17.91	-7.42	-5.89	-2.41
TOTAL	99.99	100.01	99.83	100.00	-	-	-
$\frac{U}{E + U}$	0.044	0.059	0.045	0.073	-	-	-
Participation Rate	88.0	87.3	80.6	76.6			

** L15 means less than 15 years old.

TABLE II-14

Percentage Distribution and Differences of Total (5+) Male Migrants, Stayers and ROC, by Labour Force Status, 1976

Labour Force Status	In Migrants (1)	Out Migrants (2)	Stayers (3)	R.O.C. 1976 (4)	Col. (1) - Col. (3) (5)	Col. (2) - Col. (3) (6)	Col. (2) - Col. (4) (7)
L15**	2,865	2,490	63,210	2,044,160	-	-	-
E	6,765	8,765	96,585	5,801,615	-	-	-
U	1,220	685	17,635	362,230	-	-	-
N	1,730	1,615	61,745	1,975,740	-	-	-
TOTAL	12,580	13,555	239,175	10,183,745	-	-	-
			Percentages				
L15	22.77	18.37	26.43	20.07	-3.66	-8.06	-1.70
E	53.77	64.66	40.38	56.97	13.39	24.28	7.69
U	9.70	5.05	7.37	3.56	2.33	-2.32	1.49
N	13.75	11.91	25.81	19.40	-12.06	-13.90	-7.49
TOTAL	99.99	99.99	99.99	100.00	-	-	-
$\frac{U}{E+U}$	0.150	0.070	0.154	0.060	-	-	-
Participation Rate	82.2	85.4	64.9	75.7			

** L15 means less than 15 years old.

failures returning home. Third, labour market participants are more mobile which is consistent with human capital theory. Migration is essentially an employment seeking activity.

Part 2: An Econometric Analysis

The tables presented thus far are based upon cross-tabulations of the 1971 and 1976 census data. The present subsection presents the results of statistical multiple regression analysis using the same data. Such analysis performs two sorts of functions. First, it enables one to determine whether or not the relationships among migration, age, education and labour force status heretofore analyzed are significant in the statistical sense. Second, for those relationships which are statistically significant, it enables one to infer such things as the estimated response of, say, migration to a continuous change in one variable holding all others constant.

To recapitulate, the data from the 1971 and 1976 Census provides the numbers of persons by age, education status, labour force status, sex, and migration status, and the 1971 Census distinguishes between those born in Newfoundland and those born elsewhere. The 1971 Census also provides average income and this will be dealt with in the next chapter. Of the above variables only the numbers, age and average income may be treated as continuous variables. The remainder are all binary (0,1) variables. This fact limits the sort of econometric relationships which can be estimated. Ultimately we used relationships only for males thus eliminating the sex variable. The regressions treated the number of persons as the dependent variable, and age and education status as the independent variables. Separate regressions were then run to determine the number of persons for each of the four migration status variables (Ins, Outs, Stayers, and ROC), and for each status of

employment (Employed, Unemployed, Not in the Labour Force, Total), giving a total of 16 regressions for each of the census years. For 1971 separate sets of 16 regressions were run for those born in Newfoundland and those born elsewhere. Recall that the migration status category refers only to any change in status the individual had between the year of the census and five years before. Thus, in-migrants in 1971 refer to persons who lived in Newfoundland in 1971 but elsewhere in 1966, etc. Similarly, the labour force status refers to the status as of the date of the Census. So, an unemployed person in the 1971 Census was unemployed on July 1, 1971. After running these equations for all labour force status and migration status combinations it was discovered that only in the case of the employed category of the labour force status could a significant relationship be obtained between numbers on the one hand, and age and education status on the other. Thus, the discussion below relies solely on the results obtained for employed males. Age and education did not appear to be significant determining variables for the other categories.

The general form of the regressions that were run was as follows:

$$N_j = \sum_i a_{ij} E_i + \sum_i b_{ij} E_i A + c_j A^2 \qquad (1)$$

where i = education levels

j = migration status (Ins, Outs, Stayers, ROC)

N_j = number of persons of migration status j

E_i = education level (dummy)

A = age.

This equation estimates the number of employed males of migration status j as a quadratic function of age with slope and intercept dummies

for each education level. Since E_i is a binary (0,1) variable, regression equation (1) could be viewed as series of separate regressions for each educational level i of the following form:

$$N_{ij} = a_{ij} + b_{ij} A + c_j A^2 \qquad (2)$$

with c_j constrained to be the same for all education levels. The age classifications take the form 5-10, 11-15, 16-20, etc. In our regressions the mid-cohort points are used. In the case of outmigrants a simple linear relationship on age with no multiplicative dummies seemed to fit best. The equation for out-migrants, then, is

$$N_j = \sum_i a_{ij} E_i + b_j A.$$

The regression coefficients for the 1976 and 1971 regressions are shown in Tables II-15 and II-16 respectively. The education categories for 1976 were 3+ years post-secondary education (3PS), 1-2 years post-secondary education (1-2PS), grades 9-13(9-13), grades 5-8(5-8) and less than grade 5(<5). In 1971 there were 6 such categories with 3PS being separated into 3-4 years (3-4PS) and five years plus (5PS). Each education category was then classified as with vocational training (WV) and without (WOV). As these tables show the coefficients on most of the independent variables for the Ins, Stayers and ROC are statistically significant. For the Outs the coefficients in the simple linear form are significant.

i) The Age Distribution of Migrants vs Non-Migrants

There is a variety of information we may obtain from these results in addition to the statistical significance of the fits themselves. The first of these is the information on the age distribution of migrants versus non-migrants by education classification. One useful way to summarize it is as follows. For each education level, there is a quadratic relationship

TABLE II-15

1976 Census Regression Coefficients for Employed Males (Dependent Variable is Number of Persons)
(t-statistic in brackets)

	3PS·A	1-2PS·A	9-13·A	5-8·A	L 5·A	Age^2	3PS	1-2PS	9-13	5-8	L 5 ***
	25.1520	17.2131	16.5805	26.2689	30.1260	-.390154	-24.2458	330.672	562.379	-205.506	-482.454
	(1.30)	(0.89)	(0.84)	(1.45)	(1.57)	(-1.71)	(-0.06)	(0.79)	(1.49)	(-0.59)	(-1.16)
Outs						Age	3PS	1-2PS	9-13	5-8	L5
(t)						-8.657	606.370	668.87	816.759	432.583	331.370
						(-2.82)	(3.74)	(4.13)	(5.29)	(2.90)	(2.05)
Ins	39.6231	34.2472	40.6311	40.3800	51.1240	-.553078	-194.570	-120.062	-265.043	-513.141	-1022.12
(t)	(2.06)	(1.89)	(2.22)	(2.38)	(2.46)	(-2.62)	(-0.46)	(-0.29)	(-0.73)	(-1.49)	(-1.96)
Stays	387.936	367.744	367.374	427.297	445.466	-4.97361	-4166.87	-2705.54	-645.145	-4293.43	-7075.92
(t)	(4.58)	(4.60)	(4.59)	(5.34)	(5.57)	(-5.53)	(2.05)	(-1.56)	(-0.37)	(-2.48)	(-4.09)
R.O.C.	23926.1	22873.3	21239.2	27147.0	25151.2	-295.132	-233173	-212263	24579.5	-363574	-404228
(t)	(5.12)	(4.90)	(4.55)	(5.81)	(5.39)	(-5.65)	(-2.29)	(-2.08)	(0.24)	(-3.56)	(-3.96)

*** Throughout this study L5 means "less than 5". In this case L5 means less than five years of education. The symbol < 5 also means less than 5.

Table II-16

1971 Regression Coefficients for Employed Males (Dependent Variable is Number of Persons)

(t-statistic in brackets)

A. Born in Newfoundland

	Age^2	5PS.A	3-4PS.A	1-2PS.A	9-13.A	5-8.A	L5.A	5PS	3-4PS	1-2PS	9-13	5-8	L5
	WV -.057	4.16	6.28	-.94	-.014	3.52	2.96	-59.47	-80.09	273.71	179.94	-26.73	0
	(-.49)	(.31)	(.26)	(-.086)	(-.001)	(.31)	(.42)	(-.15)	(-.14)	(1.04)	(.68)	(-.091)	0
							WV Age	5PS	3-4PS	1-2PS	9-13	5-8	L5
							-5.23	187.9	158.8	334.5	281.8	176.9	266.5
							(-3.37)	(1.48)	(1.31)	(3.37)	(2.83)	(1.60)	(1.24)
OUTS													
	WOV	3.10	2.87	2.91	-11.22	-.315	5.25	16.14	11.56	48.20	967.23	302.68	-75.55
		(.29)	(.26)	(.28)	(-1.09)	(-.030)	(.50)	(.061)	(.040)	(.216)	(4.32)	(1.35)	(-.29)
							WOV	5PS	3-4PS	1-2PS	9-13	5-8	L5
								232.6	205.4	225.0	633.8	386.3	220.1
								(2.33)	(2.01)	(2.76)	(6.86)	(4.18)	(2.21)
	WV -.168	11.23	12.04	10.30	11.80	13.41	0	-171.11	-180.51	-86.39	-134.02	-246.38	0
	(-2.69)	(1.01)	(2.04)	(2.03)	(2.26)	(1.88)	0	(-.46)	(-1.18)	(-.75)	(-1.19)	(-1.07)	0
INS													
	WOV	13.99	9.39	11.12	12.06	11.98	15.53	-280.06	-96.46	-133.92	-51.68	-116.27	-324.92
		(2.32)	(1.65)	(2.19)	(2.26)	(2.10)	(2.40)	(-1.43)	(-.71)	(-1.17)	(-.51)	(-.82)	(-1.70)
	WV -2.47	203.92	209.02	192.01	198.98	214.25	246.21	-3755	-3434	-2236	-2632	-3728	-5955
	(-5.05)	(3.71)	(4.31)	(3.96)	(4.10)	(4.42)	(2.66)	(-2.13)	(-2.63)	(-1.71)	(-2.01)	(-2.85)	(-1.43)
STAYS													
	WOV	207.30	203.57	194.28	172.02	212.74	239.39	-3255	-3074	-2396	1705	-308.1	-3439
		(4.27)	(4.20)	(4.00)	(3.78)	(4.67)	(5.25)	(-2.49)	(-2.35)	(-1.83)	(1.54)	(-.28)	(-3.11)

WV	-.566	46.63	47.53	39.06	43.18	48.42	56.53	-839.13	-703.0	-107.4	-339.5	-777.8	-12.93
	(2.03)	(1.46)	(1.70)	(1.40)	(1.64)	(1.73)	(1.62)	(-.81)	(-.92)	(-.14)	(-.52)	(-1.01)	(-1.03)
ROC													
WOV		47.05	47.17	43.90	27.12	47.82	53.50	-633.5	-671.6	-439.3	1539	148.6	-868.3
		(1.53)	(1.68)	(1.67)	(1.02)	(1.82)	(1.91)	(-.67)	(-.88)	(-.68)	(2.23)	(.23)	(-1.13)

B. Born Elsewhere

	Age^2	5PS.A	3-4PS.A	1-2PS.A	9-13.A	5-8.A	L5.A	5PS	3-4PS	1-2PS	9-13	5-8	L5
WV	-.145	9.19	10.65	10.25	11.32	9.97	0	-133.7	-142.3	-84.66	-121.6	-139.9	0
	(4.10)	(1.91)	(3.41)	(3.32)	(3.22)	(3.09)	0	(-.96)	(-1.85)	(-1.17)	(-1.34)	(-1.61)	0
OUTS													
WOV		9.52	10.73	11.37	10.11	11.21	11.85	-77.82	-129.0	-137.8	5.06	-152.3	-208.6
		(2.64)	(3.48)	(3.49)	(3.28)	(3.63)	(3.43)	(-.75)	(-1.78)	(-1.86)	(.08)	(-2.11)	(-2.08)
WV	-.205	16.93	15.59	13.49	15.01	18.78	12.41	-297.5	-217.4	-139.8	-175.82	-391.2	0
	(-4.00)	(3.66)	(3.58)	(3.15)	(3.45)	(3.39)	(3.81)	(-2.46)	(-2.26)	(-1.40)	(-1.83)	(-2.35)	-
INS													
WOV		12.13	14.20	14.19	13.69	15.88	15.67	10.41	-132.6	-140.7	-40.97	-238.6	-240.9
		(2.55)	(3.26)	(3.26)	(3.35)	(3.65)	(3.54)	(.086)	(-1.38)	(-1.46)	(-.51)	(-2.48)	(-2.18)
WV	-.146	14.14	12.12	12.27	12.68	12.97	0	-319.5	-187.1	-172.7	-190.7	-254.1	0
	(-6.22)	(3.83)	(4.37)	(5.54)	(5.29)	(4.67)	0	(-2.07)	(-1.98)	(-3.25)	(-2.91)	(-2.69)	0
STAYS													
WOV		12.04	12.12	10.97	13.58	12.54	13.86	-127.2	-168.0	-137.7	-83.87	-163.3	-272.5
		(5.02)	(5.47)	(5.14)	(6.49)	(6.31)	(5.78)	(1.94)	(-3.16)	(-2.58)	(-1.86)	(-3.68)	(-4.16)
WV	-25.74	22 26	20 95	19 42	20 21	23 01	21 62	-365 90	-82 46	-85 37	102 41	-278 08	-349 83
	(-2.39)	(1.42)	(1.46)	(1.36)	(1.41)	(1.61)	(1.51)	(-.62)	(-.16)	(.17)	(.21)	(-.56)	(-.70)
ROC													
WOV		20.47	17.95	13.40	-1.07	4399	2882	3229	18498	40964	287889	28929	-38389
		(1.11)	(1.25)	(.94)	(-.075)	(3.08)	(2.01)	(.048)	(.37)	(.82)	(5.78)	(.58)	(-.77)

between the number of employed males and age. Furthermore, each of these is a single-peaked curve. We may thus calculate the peak of the number - age distribution for each education category by determining the value of A such that:

$$\frac{\partial N_{ij}}{\partial A} = 0 = b_{ij} + 2c_j A \qquad (3)$$

These peak ages are reported in Tables II-17 and II-18 for 1976 and 1971. For the linear version of the out-migration equation the curve declines continuously from the lowest age level.

Consider first the peaks for the 1976 Census by each of the five education levels - 3+ years post-secondary education, 1-2 years post-secondary education, grades 9-13, grades 5-8, and less than grade 5. The ages observed are those on the date of the 1976 Census so that on average these ages will be upper bounds on the age at which migration takes place. Since the migration occurred sometime in the period 1971-76, one might roughly subtract 2-3 years from the peak ages for the migrants to obtain the average age at migration.

The most striking result in the 1976 data is that non-migrants consistently have a peak age higher than migrants, while within the migrant category Ins have a higher peak than Outs. Thus, in conformity with the cross-tabulated results presented earlier, out-migrants tend to be younger than in-migrants who in turn tend to be younger than Stayers. This conforms to the general notion that the returns to migration are higher for young persons. For in-migrants the peak age appears to be in the thirties. In-

TABLE II-17

Peak Age by Education and Migration Status -
1976 Census

Migration Status \ Education Status	3 + PS	1-2 PS	9-13	5-8	L 5 ***
Outs	32.2	22.1	21.3	33.7	38.6
Ins	35.8	31.0	36.7	36.7	46.4
Stayers	39.0	37.0	36.9	43.0	44.8
ROC	40.5	38.8	36.0	46.0	42.6

*** L5 means less than five years of education.

TABLE II-18

Peak Age by Education and Migration Status - 1971 Census

Migration Status \ Education Status		5PS		3-4PS		1-2PS		9-13		5-8		L5	
		WV	WOV	WV	WOV	WV	WOV	WV	WOV	WV	WOV	WV*	WOV
Born in Nfld.	Outs	36.3	27.0	54.8	25.1	-8.2	25.4	-.12	-98.0	30.7	-2.75	25.9	45.8
	Ins	33.5	41.8	35.9	28.0	30.7	33.2	35.2	36.0	40.0	35.8	-	46.4
	Stays	44.0	44.7	42.4	41.3	38.9	39.4	40.3	34.9	43.4	43.1	49.9	48.5
	ROC	41.2	41.6	42.0	41.7	34.5	38.8	38.2	24.0	42.8	42.3	50.0	47.3
Born Else-where	Outs	31.7	32.9	36.8	37.1	35.4	39.3	39.1	34.9	34.4	38.7	-	40.9
	Ins	41.2	29.5	38.0	34.5	32.8	34.5	36.5	33.1	45.7	38.7	30.2	38.1
	Stays	48.3	41.1	41.4	41.4	41.9	37.5	43.3	46.4	44.3	42.9	-	47.3
	ROC	43.2	39.8	40.7	34.9	37.7	26.0	39.3	-.02	44.7	85.5	42.0	56.0

* There are very few observations in the category L5WV.

migrants are people who have had considerable labour experience but who still have the bulk of their working life ahead of them. Since they are consistently older than out-migrants they could be return migrants who have gone out and acquired education and/or skills as well as working experience. Alternatively they could be skilled workers from the rest of Canada coming to fill jobs for which not enough qualified native Newfoundlanders are available.

The peak age appears to be lower for the categories 1-2 PS and 9-13 in most cases. This is a reflection of the greater average level of educational attainment by the population in recent years. Furthermore, within these two educational categories, Outs are of significantly lower peak age than Ins and Stayers; i.e., 10-15 years younger. Apparently these particular out-migrants are leaving immediately after acquiring their formal training and returning at a later date after acquiring additional work experience. These tendencies are rendered even stronger if we use the straightline version of the regression for Outs since their "peak" is then the youngest category possible. The lower education categories, in addition to having higher age peaks, also have less dispersed peaks over migration status categories. In fact, for the category L5, the Ins and the Stayers are of roughly the same age while the outs are about 8 years younger.

The same general tendencies appear for the 1971 Census results reported in Table II-18. Consider first those born in Newfoundland. Outs tend to be younger than Ins (especially when one uses the simple line as version for the format), while migrants all tend to be younger than Stayers. The peaks do not appear to have shifted much for the migrants although those for the Stayers seem to have fallen marginally between 1971 and 1976. There

are now, however, many more categories of education and the dispersion of peaks within each category seems quite variable.

The lower educational categories are the most popular ones. They appear to have less difference in peak age between Ins and Stayers than do the categories with some higher education. The largest group of persons is 9-13, those with some high school education. Within this group those who have no vocational training appear to leave at a very young age (a negative peak) while the Ins are actually a year or so older at the peak than the Stayers. The Ins, of course, are return migrants here. Out-migration occurs at a very young age and migrants return after having been outside Newfoundland for some years. In the case of 9-13 WOV the average age of those returning is comparable to, or greater than, the average age of the Stayers. For all remaining categories, the peak age for return migrants is considerably less than for Stayers, except at the lowest education level (L5WOV).

In the higher education categories the age of out-migration seems to be higher. This, of course, can be explained at least partly by the fact that these persons are necessarily older when they complete their schooling. However, the fact that they migrate at an older age would lend support to the notion that they receive their higher education in Newfoundland at the latter's expense and move out afterward (rather than migrating to take higher education elsewhere).

One other interesting fact to note is that those born in Newfoundland who fall in the ROC category; that is, those who migrated out more than five years before, tend to be slightly younger than the Stayers, but

slightly older than the Return migrants. The exception once again is the category 9-13 WOV. Here, the peak for ROC is 24, much younger than for the returnees or the Stayers. These are the fairly large category of out-migrants who left at a fairly young age (19 years or less) and who will presumably spend much of their productive life outside Newfoundland. Many would be predicted to return later on in life. For most other categories, the peak age differs between ROC and Stayers by a much smaller amount.

Consider now those born elsewhere. There tends to be much less dispersion of peak age for this group than for those born in Newfoundland. Migrants (Outs and Ins) tend to be slightly younger than Stayers (i.e., persons who migrated in more than five years before and have yet to return). This is as one might expect since Stayers were all Ins in some previous period. Also, Outs tend, in many cases, to be older than Ins. This is to be expected as well since all Out-migrants were In-migrants some time in the past. However, the closeness of the peaks would tend to indicate that those who are returning to the rest of Canada spent a very short time on average in Newfoundland. The final thing to note is that the average age of migrants tends to be relatively high for those born elsewhere as compared with those born in Newfoundland. Part of this can be attributed to poorer job opportunities in Newfoundland for young entrants to the labour force, and part to the fact that presumably proportionately many more Newfoundlanders go away for their education than vice versa.

ii) The Education Distribution of Migrants versus Non-Migrants

One would like to perform a similar sort of exercise using the education distribution as was done for the age distribution; that is, obtain

the peak education level for migrants and non-migrants to compare the human capital exchange involved in migration. Since education is a discrete rather than continuous variable one cannot do that in precisely the same way. Instead, the peak category of education can be identified. One further complication is that the education distribution often shows more than one peak, unlike the age distribution. An explanation of how we determined the peak category within the education distribution is first presented.

Consider again equation (2). For education category i and migration status j the equation reads as follows:

$$N_{ij} = a_{ij} + b_{ij} A + c_j A^2$$

Suppose that the next education category up from i is k. The equation for education category k and the same migration status is

$$N_{kj} = a_{kj} + b_{kj} A + c_j A^2 \qquad (3)$$

Suppose we denote the change in the number of persons of migration status j as we go from education category i to education category k as $\Delta N_{k-i,j}$. This will be given by $N_{kj} - N_{ij}$, or

$$\Delta N_{k-i,j} = a_{kj} - a_{ij} + (b_{kj} - b_{ij})A \qquad (4)$$

The measures $\Delta N_{k-i,j}$ should be made comparable for various categories of migrants and non-migrants. As it stands $\Delta N_{k-i,j}$ will be much larger for, say, Stayers than for either migrating status since there are absolutely larger numbers of Stayers. We shall normalize $\Delta N_{k-i,j}$ by dividing through by the total population involved. Thus, the proportionate change in the number of persons in migration category j as one moves from education level

i to education level k will be given by:

$$\frac{\Delta N_{k-i,j}}{N_j} = \frac{a_{kj} - a_{ij}}{N_j} + \frac{(b_{kj} - b_{ij})A}{N_j} \qquad (5)$$

The values for this proportionate change are given in Table II-19 and II-20 for 1976 and 1971 respectively. Tables II-19 and II-20 show the change in the proportion of the population as we move from one education level to another, holding age constant. Both the magnitude and the sign depends on the age chosen. For example, consider moving from 1-2PS to 3PS in Table II-19 within the migration status Outs. $\frac{\Delta N}{N}$ equals -0.04049 + 0.00090A. For all ages up to 45 (i.e., $\frac{0.04049}{0.00090}$), $\frac{\Delta N}{N}$ will be negative, while above age 45 $\frac{\Delta N}{N}$ is positive. We then record age 45 as the age at which $\frac{\Delta N}{N}$ equals zero. The minus sign in brackets indicates $\frac{\Delta N}{N}$ is negative for ages below the recorded number and positive above this number. Alternatively, the change in education category from 5-8 to 9-13 becomes zero at age 80 ($\frac{0.08761}{0.00110}$). The positive sign indicates that $\frac{\Delta N}{N}$ is positive at all ages below 80 and negative for all ages above 80. The ages at which $\frac{\Delta N}{N}$ equal zero will be referred to as <u>peak ages</u>. The peak ages and their associated signs (+ and -) allow us to readily identify, for any arbitrary age level, the pattern of $\frac{\Delta N}{N}$ as we move up education categories.

These positive and negative signs allow us to obtain peaks for the education distribution within each migration status as follows. Consider Stayers in the 1976 Census. For all ages up to 61 the pattern of (+,-) signs on $\frac{\Delta N}{N}$ is as follows:

TABLE II-19

1976 Census Results: Effects of Educational Status on the Propensity to Migrate

ΔE	3PS - [1-2PS]	[1-2PS] - [9-13]	[9-13] - [5-8]	[5-8] - L5
Outs:				
ΔN/N	-0.04049 +0.00090A	-0.02643 +0.00007A	0.08761 -0.00110A	0.03160 -0.00044A
Peak Age	45(-)	378(-)	80(+)	72(+)
Ins:				
ΔN/N	-0.01101 +0.00079A	0.02143 -0.00094A	0.03933 +0.00004A	0.07524 -0.00159A
Peak Age	14(-)	23(+)	(+)	47(+)
Stayers				
ΔN/N	-0.01513 +0.00021A	-0.02133 +0.000003A	0.03777 -0.00062A	0.02881 -0.00019A
Peak Age	72(-)	7110(-)	61(+)	152(+)
R.O.C.:				
ΔN/N	-0.00348 +0.00018A	-0.04082 +0.00028A	0.06690 -0.00102A	0.00701 +0.00034A
Peak Age	19(-)	146(-)	66(+)	(+)

TABLE II-20

1971 Census Results: Effects of Education Status on the Propensity to Migrate

Part A: Born in Newfoundland

	ΔE	5PS -3-4PS (WOV)	3-4PS -1-2PS (WOV)	1-2PS -9-13 (WOV)	9-13 -5-8 (WOV)	5-8 -L5 (WOV)	5PS W-WOV	3-4PS W-WOV	1-2PS W-WOV	9-13 W-WOV	5-8 W-WOV	L5 W-WOV
OUTS N = 75.55 ($x10^2$)	ΔN/N ($x10^2$)	.06 +.003A	-.49 -.00045A	-12.18 +.18A	8.81 -.14A	5.01 -.08A	-1.00 +.015A	-1.22 +.05A	2.99 -.05A	-10.43 +.15A	-4.36 +.05A	1.00 -.03A
	PEAK	(+)	(-)	66(-)	64(+)	65(+)	67(-)	26(-)	65(+)	68(-)	94(-)	33(+)
INS N = 22.05 ($x10^2$)	ΔN/N ($x10^2$)	-5.06 +.20A	1.70 -.08A	-3.72 -.04A	2.92 -.004A	9.46 -.16A	1.68 -.12A	-3.82 +.12A	2.16 -.04A	-3.74 -.02A	-5.90 +.06A	14.68 -.70A
	PEAK	25(-)	21(+)	(-)	730(+)	59(+)	14(+)	32(-)	54(+)	(-)	98(-)	21(+)
STAYS N = 868.25 ($x10^2$)	ΔN/N ($x10^2$)	-.21 +.0043A	-.77 +.012A	-4.71 +.025A	2.31 -.05A	3.59 -.02A	-.58 -.0037A	-.42 +.012A	.18 -.0025A	-4.98 +.04A	-3.92 +.0017A	-2.89 +.012A
	PEAK	49(-)	63(-)	192(-)	47(+)	146(+)	(-)	34(-)	75(+)	135(-)	2279(-)	235(-)
ROC N = 324.60 ($x10^2$)	ΔN/N ($x10^2$)	.12 -.0004A	-.71 +.012A	-6.07 +.048A	4.27 -.06A	3.12 -.012A	-.64 -.001A	-.10 +.43A	1.02 -5.80A	-5.76 +.05A	-2.84 +.0018A	-1.31 +.012A
	PEAK	300(+)	59(-)	127(-)	71(+)	260(+)	(-)	.22(-)	.18(+)	120(-)	1580(-)	109(-)

TABLE II-20

Part B: Born Elsewhere

	ΔE	5PS -3-4PS (WOV)	3-4PS -1-2PS (WOV)	1-2PS -9-13 (WOV)	9-13 -5-8 (WOV)	5-8 -L5 (WOV)	5PS W-WOV	3-4PS W-WOV	1-2PS W-WOV	9-13 W-WOV	5-8 W-WOV	L5 W-WOV
OUTS N = 29.25 ($x10^2$)	ΔN/N	1.75 -.04A	.30 -.02A	-4.88 +.04A	5.38 -.04A	1.93 -.02A	-1.91 -.01A	-.46 -.003A	1.82 -.04A	-4.33 +.04A	.42 -.04A	7.13 -.41A
	PEAK	44(+)	15(+)	122(-)	135(+)	97(+)	(-)	(-)	46(+)	108(-)	11(+)	17(+)
INS N = 33.85 ($x10^2$)	ΔN/N	4.22 -.06A	0.24 +.0002A	-2.94 +.01A	5.84 -.06A	.07 +.01A	-9.10 +.14A	-2.51 +.04A	.03 -.02A	-3.98 +.04A	-4.51 +.09A	7.15 -.10A
	PEAK	70(+)	(+)	294(-)	97(+)	(+)	65(-)	63(-)	2(+)	100(-)	50(-)	72(+)
STAYS N = 35.75 ($x10^2$)	ΔN/N	1.14 -.0023A	-0.85 +.03A	-1.50 -.07A	2.22 +.03A	3.05 -.04A	-5.38 +.06A	-.53 +.0001A	-.98 +.04A	-2.99 -.03A	-2.54 +.01A	7.62 -.39A
	PEAK	496(+)	28(-)	(-)	(+)	76(+)	90(-)	5300(-)	25(-)	(-)	254(-)	20(+)
ROC N = 51941.58 ($x10^2$)	ΔN/N	-.29 -.005A	-.43 +.01A	-4.75 +.03A	4.99 -.08A	1.3 +.03A	-.77 +.0034A	-.51 +.01A	-.62 +.01A	-5.35 +.04A	1.09 -.04A	.07 -.01A
	PEAK	(-)	43(-)	158(-)	62(+)	(+)	225(-)	51(-)	62(-)	134(-)	27(+)	7(+)

3PS-	1-2PS-	9-13-	5-8-
1-2PS	9-13	5-8	L5
-	-	+	+

This means that as one goes from L5 to 5-8 and from 5-8 to 9-13 the number of persons increases at each stage. However, in going from 9-13 to 1-2PS the numbers fall; and, they fall yet further in going from 1-2PS to 3PS. This implies that the peak of the distribution is in the range 9-13 and it is a single peak. Once the age goes above 61 the positive sign under the 9-13 -- 5-8 category becomes negative so the pattern is (- - - +). Now the peak is in the range of 5-8 and is still a single peak. The same general pattern holds for the ROC category, although the peak remains at the 9-13 category until age 66 is reached. Thus the peak level of education is slightly higher for old persons outside Newfoundland than inside.

The case of a double peak can be observed for In-migrants. Up to the age of 14 the pattern is (- + + +) thus the peak is at 1-2PS. Between 14 and 22 years of age the pattern changes to (+ + + +) so the peak is in the highest education category. Finally, when the age is above 22 and below 47, the pattern becomes (+ - + +). This indicates a peak at 9-13 and again at 3PS.

The 1976 Census results shown in Table II-19 tell an interesting story. The pattern of Ins and Stayers has been described above. The Outs follow a single peaked pattern identical to the Stayers up to the age of 50 (- - + +). That is, the peak is in the range 9-13. Once we move above 50, the pattern becomes (+ - + +) and a second peak emerges at the upper education level. Comparing the patterns for Ins, Outs and Stayers leads

to the following observations. In the age categories in which the bulk of the migration occurs, Out-migrants and Stayers have single peaks at the level 9-13. In-migrants, on the other hand, have a single peak in the post-secondary education category up to the age 22, while above 22 they have a peak in 3PS as well as 9-13. Thus, the In-migrants whether they be returnees or not tend to be distributed relatively more to post-secondary education levels than do the Outs and Stayers. At least for the employed males category we are considering here, the province does not appear to do badly on the human capital exchange in the 1976 data. Of course, there are about 30% more Outs than Ins so that one would have to do a much more detailed analysis of the balance on human capital account of Outs and Ins. The evidence here only suggests that the distribution of Ins is more biased towards higher education levels than for the Outs.

A similar sort of analysis may be done for the 1971 Census results using Table II-20. Consider first those born in Newfoundland. The effect of changes in education level for those without vocational training is given in the first 5 columns. Up to the age of 64 the pattern for Outs is of the following form:

5PS-	3-4PS-	1-2PS-	9-13-	5-8
3-4PS	1-2PS	9-13	5-8	-L5
+	-	-	+	+

That is, there is a peak in the education distribution at 9-13 and another one at 5PS, the highest education category. Above the age of 25 the pattern for the Ins is identical with the above while at ages below 21, the pattern becomes (- + - + +). That is, the upper peak falls from 5PS to the 3-4PS category. In any case the migrants have a peak in the education distribution

in the 9-13 category and another in the higher post-secondary categories. For the Stayers, there is only a single peak at category 9-13 (- - - + +) up to the age of 47. Beyond that the peaks are at 5-8 and 5PS. The pattern for ROC is similar to that for migrants, (+ - - + +) up to age 59. This is not surprising given that ROC born in Newfoundland were migrants in an earlier period. All this tends to indicate that the migrant population is biased towards higher educational levels than the non-migrant population, not only for out-migrants but for return migrants as well. This is a well-known hypothesis discussed earlier in the study.

Relatively little can be discerned from the information on vocational training for those born in Newfoundland. The pattern for Outs up to age 26 from the addition of vocational training to given education levels appears to be:

5PS	3-4PS	1-2PS	9-13	5-8	L5
-	-	+	-	-	+

There is a high propensity to take vocational training in the categories 1-2PS and L5. The former is easily explained as being persons who do not complete a 3 or 4 year post-secondary education programme but do take vocational training. Above the age of 26 the category 3-4PS also becomes +, and above 33, the lowest category is -. The pattern for Ins is somewhat similar. Up to age 21 it is (- - - - +). The propensity to take vocational training in the category L5 disappears at age 21, and at age 32 those in 3-4PS acquire a + sign.

The pattern for Stayers is (- - + - - -) up to age 34. This indicates a high propensity to take vocational training in the 1-2PS category. This extends to 3-4PS above the age of 34. Overall, all we

can say is that in the lowest level of education (L5) migrants tend to have a higher propensity to acquire vocational training than do non-migrants.

Turn now to those born outside Newfoundland. From the first five columns of Part B of Table II-20 we obtain the relative education distribution of various migration status categories. Up to age 44 the Outs follow the pattern:

5PS-	3-4PS-	1-2PS-	9-13-	5-8-
3-4PS	1-2PS	9-13	5-8	L5
+	-	-	+	+

Peaks appear in the category 9-13 and again at 5PS, exactly as in the Out-migrant category for those born in Newfoundland. At ages above 44, the peak at 5PS disappears. These are older return migrants going back to the rest of Canada, and they have lesser tendency to be highly educated. The Ins category reads (+ + - - + +). Once again this indicates peaks at 9-13 and at 5PS, with a tendency for the distribution to begin rising in the 3-4PS category. The Stayers up to age 28 show a pattern (+ - - + +) while those above 28 are identical with the Ins (+ + - + +). For those born outside Newfoundland these three categories are all persons who have migrated into Newfoundland sometime in the past.

By contrast, the ROC category has a distributional pattern (- - - + +). It reaches a peak in the category 9-13 and falls off continuously thereafter. This confirms the tendency obtained for those born in Newfoundland for migrants to be distributed relatively more to the higher post-secondary education categories.

The latter 6 columns in Table II-20 show the propensity to acquire

vocational training for various categories of migration status. For Outs, the pattern is:

5 PS	3-4 PS	1-2 PS	9-13	5-8	L5
-	-	+	-	-	-

Only in the category 1-2 PS does the proportion of the population rise as one goes from WOV to WV. For Ins the pattern is (- - - - - +) so the lowest education category has a high propensity to take vocational training. For the Stayers the distribution above 25 years of age is the same as for Outs. The interesting thing is that the pattern for ROC is (- - - - - -) for all ages over 27. This would tend to indicate that migrants have a slightly higher tendency to take vocational training than do non-migrants.

In summary, the education distribution comparisons appear to indicate that In-migrants are distributed relatively more to higher education categories than Outs and Stayers. Also, migrants born in Newfoundland with low education have a tendency to have taken vocational training while non-migrants with the same education have not. There is some support for the notion that Out-migrants to the rest of Canada return more highly qualified. Migration would be viewed as a form of investment in human capital in this case. There is no evidence that it is primarily the less qualified returning home who comprise the Ins. More detailed computations would have to be performed to compare the relative heights of the peaks for migrants and non-migrants. Time constraints prevented that from being done here. Finally, the reader is reminded that the calculations reported here are for the employed male population only. Good statistical fits for the unemployed and those not in the labour force could not be obtained.

The general conclusion of Chapter II is that in-migrants are not, as has often been assumed, the lowest trained and least educated drifting home to Newfoundland, and so adding to the province's problems. The out-migrants appear to be younger and less well trained than the in-migrants. The in-migrants are therefore making a positive contribution to human resource stocks in the province and it must be assumed making as well a positive contribution to the well-being of Newfoundlanders.

Footnotes to Chapter II

(1) Larry A. Sjaastad, "The Costs and Returns of Human Migration", *Journal of Political Economy*, vol. LXX Supplement: October, 1962, pp. 80-93. Hereafter, Sjaastad.

(2) L.A. Sjaastad, *ibid.*, p. 81.

(3) Gunnar Myrdal, *Economic Theory and Under-Developed Regions* (London: Gerald Duckworth & Co., 1957), Ch. 3.

(4) Sjaastad records rates of out-migration from the American Upper-Midwest and compares this profile with the gross migration for the United States as a whole. He makes no effort to compare the age profile of in-migrants with the out-migrants for a given region. See Sjaastad, *op. cit.*, p. 89.

(5) The figures also underestimate total movement since they cover only the population 5 years of age and over. An indication of the extent of the downward bias can be obtained by comparing the total gross flow migration for the period 1971-76 as shown in Table I-3 with the total gross stock measure as recorded on line 14 of Table II-2 of this Section. The former (Table I-3, line 5), shows total in- and out-migration as roughly 124,000 whereas line 14 of Table II-1 if we add females is 50,995.

(6) For a further discussion of these points see, H.G. Grubel and A.D. Scott, "Determinants of Migration: The Highly Skilled", *International Migration*, vol. 5 (1967), pp. 127-39.

(7) The calculations used in this section were suggested by Denis Gauthier of the Economic Council of Canada.

CHAPTER III

The Income Gains from Migration

Introduction

This Chapter is concerned with the average income of the four segments of the population which we are dealing with in this study - Ins, Outs, Stayers and the Rest of Canada. As the title indicates we are dealing with the income gains to migration not with the returns to migration in the usual sense. To get an estimate of the latter would require not only a measure of money income gains accruing to migration, but also the money costs of undertaking the move. Migration as a "return" places this process squarely within investment theory and as such requires the investigator to discount both the expected net income gains and the associated costs to arrive at a full appreciation of whether the move was efficient. Furthermore, the evidence we have is for the short-term gains to migration since we only identify persons who moved within the last five years.

The evidence set out below is a measure of average income earned by migrants and non-migrants in the previous 12 months. As such it is not necessarily the income earned by a migrant at the time of his move. However, it does represent his income at the time the census was taken and thus we are able to compare average incomes between the four segments of the population. A more complete estimate of returns would involve a measure of an individual's income prior to migration; his income in his first job in the new location and his subsequent income for successive years in the new location. We have no evidence on income gain or losses in the early years.

The last section of this chapter, though, fits average income equations by age, education level and migration status. Thus we can conceptually compare a migrant with given characteristics to a non-migrant of the same characteristics. This will indicate the average gain in income to migration.

The central concern in this chapter is to investigate if the measured returns to migration are consistent with our findings on the characteristics of migrants described in Chapter II. For example, is it the case that movers earn a positive income gain for their efforts (over non-migrants); does this gain vary between the young and the old, the educated and the less educated, and between in- and out-migrants? In addition we are able to observe whether the gains differ between migrants born in Newfoundland and those born elsewhere. As in the previous chapter the results reported are for males only. The pattern of income gains for females, as for their characteristics, are at such variance with expected results that they were omitted from the study. In a number of cases it appears that womens's migration patterns are affected by male migration; i.e., wives accompanying husbands. These different motives strongly influence their "returns" to migration. The order of discussion is similar to that in Chapter II. In addition to the single variable tables a series of multi-variate equations have been run to assist in ascertaining precise peaks in age and education by income class. Here, however, regressions were run only for the employed segment of the labour force. Income estimates were available only for the 1971 Census.

Part I: A Quantitative Analysis of Income and Migration Status

(i) Income, Age and Migration

In a cross section profile of earnings by age extant research

suggests that the lifetime income path is concave; in particular, rising gradually from an individual's early working years, reaching a peak sometime during the sixth decade and then beginning to decline thereafter, dropping sharply after the age of 65. For migrants it is difficult to predict what the relationship between income gains and age would be. In terms of human capital theory one would expect that returns to migration would rise with age since the migrant must recoup his moving costs over a shorter period of time.

Tables III-1 and III-2 sets out the average income, by age, place of birth and migration status (Columns (1) - (4)). In order to measure the returns to migration both against migrant and against non-migrant groups the relevant ratios of average income were calculated. These appear in Columns (5) to (9) along with a comparison on average income by age in Newfoundland and the Rest of Canada.

The pattern of average income, by age, for non-migrants reveals, as expected, that income rises with age reaching a peak in the age cohort 36-45 and declines thereafter. This age-income profile applies for non-migrants who were born in Newfoundland and for those who were born elsewhere. However for migrants this coincidence between the two classes of migrants breaks down. For in-migrants born in Newfoundland; i.e., returnees, average income peaks in the age cohort 46-55 while for those coming to the province who were born elsewhere; i.e., newcomers, the highest average income occurs in the cohort 56-65. Note also that the average incomes of those not born in the province are higher than for the native born, regardless of status; i.e., Ins, Outs, Stayers or ROC. For both groups we expect average income to rise

with age in order to offset the shorter working life over which the costs of relocation can be re-captured. For out-migrants the profiles for those born in Newfoundland and those born elsewhere is approximately the same. The findings for in-migrants, then, suggests that either migrants not born in Newfoundland require greater enducements to move to the province than do native Newfoundlers or that natives returning have lower skills. A partial answer to this query must await the discussions on migration by level of schooling.

If we compare migrants age earnings profile with those of non-migrants, that is compare average incomes of the INS with the ROC's (col. 7) and the OUTS with the STAYERS (col. 6) an interesting differences emerges when we standardize by place of birth. For the in-migrants who were born in the province the ratios shown in Column 7 of Table III-1 approximate 1.0. Since the average incomes recorded in the 1971 Census cover migrants who moved to the province over the last five years this implies that on average the migrant has resided in Newfoundland for 2½ years and in that time has gained parity with average incomes paid in other provinces. For those born elsewhere there is an average income gain of better than 30% over that earned in their respective provinces of origin. Again we must await the analysis of migration by level of schooling to see whether this type of investment accounts for the observed difference. In the case of out-migrants there is a clear gain to native born migrants who leave the province (Col. 6 of Table III-1) while such a gain for the non-Newfoundland born does not appear in the ratios shown (Table III-2, col. 6).

TABLE III-1

Average Income of Migrants, Stayers and ROC and Ratios of Income Between These Classifications, by Age, for Employed Males, Born In Newfoundland, 1971

Age	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
1) 5-10	0	0	0	0	0	0	0	0	0
2) 11-15	2,400	3,015	883	1,670	2.72	3.41	1.44	1.81	0.53
3) 5-15	0	3,015	886	1,670	0	3.40	0	1.81	0.53
4) 16-20	2,183	3,168	1,568	2,865	1.39	2.02	0.76	1.11	0.55
5) 21-25	4,747	5,638	4,155	5,736	1.14	1.36	0.83	0.98	0.72
6) 16-25	4,583	4,846	3,142	4,901	1.46	1.54	0.94	0.99	0.64
7) 26-35	6,764	7,002	6,132	7,733	1.10	1.14	0.87	0.91	0.79
8) 36-45	8,599	7,753	6,597	8,799	1.30	1.18	0.98	0.88	0.75
9) 46-55	8,876	7,569	6,293	8,780	1.41	1.20	1.01	0.86	0.72
10) 56-65	6,500	6,061	5,620	8,214	1.16	1.08	0.79	0.74	0.68
11) 26-65	7,354	7,129	6,226	8,277	1.18	1.15	0.89	0.86	0.75
12) 66+	5,900	4,651	5,626	7,230	1.05	0.83	0.82	0.64	0.78

TABLE III-2

Average Income of Migrants, Stayers and ROC and Ratios of Income Between These Classifications, by Age, for Employed Males, Born Elsewhere, 1971

Age	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
1) 5-10	0	0	0	0	0	0	0	0	0
2) 11-15	895	649	1,454	493	0.62	0.45	1.82	1.32	2.95
3) 5-15	895	649	1,454	493	0.62	0.45	1.82	1.32	2.95
4) 16-20	2,544	2,159	1,156	1,748	2.20	1.87	1.46	1.24	0.66
5) 21-25	6,446	5,377	5,453	4,890	1.18	0.99	1.32	1.10	1.12
6) 16-25	5,816	4,316	3,876	3,641	1.50	1.11	1.60	1.19	1.06
7) 26-35	9,407	9,384	10,588	7,860	0.89	0.89	1.20	1.19	1.35
8) 36-45	12,368	11,096	12,971	9,286	0.95	0.86	1.33	1.19	1.40
9) 46-55	12,416	10,487	12,199	9,056	1.02	0.86	1.37	1.16	1.35
10) 56-65	14,448	10,549	9,707	7,970	1.49	1.09	1.81	1.32	1.22
11) 26-65	10,783	10,123	11,691	8,577	0.92	0.87	1.26	1.18	1.36
12) 66+	0	11,120	10,190	6,932	0	1.09	0	1.60	1.47

These findings on the relative gains to migration; i.e., migrants relative to non-migrants, suggests that in the case of Newfoundland born migrants returning home, a substantial number who made such a move are not motivated by economic gain but for those born elsewhere income gain is the dominant motive for migrating to the province. Finally for both Ins and Outs born in Newfoundland there is a clear gain over Stayers. A comparison of migrants born elsewhere (Ins and Outs) with those who remain in the province up to the date of the census reveals no consistent pattern of gain or loss. Apparently the motive to migrate for those born elsewhere is more related to relative income gains vis a vis their province of origin or destination (i.e., see Cols. 7 and 8 of Table III-2).

(ii) Income Gains, Education Level and Migration

Tables III-3, III-4, III-5 and III-6 report average income for Ins, Outs, Stayers and ROC by level of education by place of birth. These average income figures are for the twelve month period preceding July 1, 1971. While we cannot observe what they were earning before they migrated we can compare their average income with non-migrants who have the same education level. The data allows us to observe how income changes with education level within a given migration status and how income changes with migration status for a given level of education.

As one would expect, regardless of the place of birth; i.e., in this case born in Newfoundland or born elsewhere, average income is positively associated with increased years of schooling. This is clearly shown in Tables III-3, III-4, III-5 and III-6. There are only two exceptions to this finding. First in the case of migrants as

we move from less than five years of schooling to 5-8 years of schooling there is a drop in average income for some groups. This may be due to an interaction effect between age and migration. Such a possibility will be investigated in the multi-variable analysis in the second section of this chapter. Second, for Stayers as we go from those with high schooling training (9-13) to those with 1-2 years of post secondary education average incomes decline. This drop may be accounted for by the large entry of young people with this level of training into the local labour market. Recall from Chapter II that the 1-2 post secondary group showed a substantial propensity to leave the province (Tables II-4 and II-5). Finally when one compares migrants with and with out vocational training it is evident that average incomes are higher for the former than for the latter, regardless of whether the person is born in Newfoundland or is born elsewhere. The exception is for those individuals with 5 or more years of post-secondary education. In this case the average income of those with vocational training is less than those without vocational training.

The income gains from migration can be conveniently measured by taking the ratio of average income of migrants to the average income of non-migrants. Consider first the out-migrants as shown in column 6 of the four tables under review. It is worth mentioning that we are able to standardize for place of birth. In doing so this means that the comparison is between migrants and non-migrants within a given population base i.e., either those born in Newfoundland or those born elsewhere. However it is possible to compare income levels

TABLE III-3

Average Income of Migrants by Level of Education for Ins, Outs, Stayers and ROC, and Ratios of Average Income Between These Groups, Employed Males, Born In Newfoundland, With Vocational Training, 1971

Level of Education	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
				PANEL A					
1) 5+ Post Sec.	7,926	10,117	9,789	15,079	.81	1.03	.53	.67	.65
2) 3-4 Post Sec.	7,302	6,962	7,699	10,141	.95	.90	.72	.69	.76
3) 1-2 Post Sec.	6,480	6,048	6,158	7,748	1.05	.98	.84	.78	.79
4) 9-13	5,836	5,951	6,555	7,628	.89	.91	.77	.78	.86
5) 5-8	5,534	5,028	5,615	7,373	.99	.90	.75	.68	.76
6) <5	0	8,250	7,838	7,767	0	1.05	0	1.06	1.01
				PANEL B					
7) Row (1) - Row (2)	+624	+3,155	+2,090	+4,938					
8) Row (2) - Row (3)	+822	+914	+1,541	+2,393					
9) Row (3) - Row (4)	+644	+97	-397	+120					
10) Row (4) - Row (5)	+302	+923	+940	+255					
11) Row (5) - Row (6)	-	-3,222	-2,223	-394					

TABLE III-4

Average Income of Migrants by Level of Education for Ins, Outs, Stayers and ROC, and Ratios of Average Income Between These Groups, Employed Males, Born Elsewhere, With Vocational Training, 1971

Level of Education	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
				PANEL A					
1) 5+ Post Sec.	9,868	10,424	14,766	12,619	.67	.71	.78	.83	1.17
2) 3-4 Post Sec.	9,667	10,531	10,800	9,277	.90	.98	1.04	1.14	1.16
3) 1-2 Post Sec.	7,947	10,163	9,496	7,916	.84	1.07	1.00	1.28	1.20
4) 9-13	10,555	8,880	10,433	7,985	1.01	.85	1.32	1.11	1.31
5) 5-8	11,327	6,819	9,530	7,280	1.19	.72	1.56	.94	1.31
6) <5	6,067	0	0	6,632	-	0	.91	0	0
				PANEL B					
7) Row (1) - Row (2)	+201	-107	+3,966	+3,342					
8) Row (2) - Row (3)	+1,720	+368	+1,304	+1,361					
9) Row (3) - Row (4)	-2,608	+1,283	-937	-69					
10) Row (4) - Row (5)	-772	+2,061	+903	+705					
11) Row (5) - Row (6)	+5,260	+6,819	+9,530	+648					

TABLE III-5

Average Income of Migrants by Level of Education for Ins, Outs, Stayers and ROC, and Ratios of Average Income Between These Groups, Employed Males, Born in Newfoundland, Without Vocational Training, 1971

Level of Education	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
				PANEL A					
1) 5+ Post Sec.	12,482	7,660	10,045	13,887	1.24	0.76	0.90	0.55	0.72
2) 3-4 Post Sec.	6,548	6,686	6,444	9,297	1.02	1.04	0.70	0.72	0.69
3) 1-2 Post Sec.	6,257	5,781	5,811	7,669	1.08	0.99	0.82	0.75	0.76
4) 9-13	6,174	5,503	5,734	6,797	1.08	0.96	0.91	0.81	0.84
5) 5-8	4,487	5,139	4,527	6,526	0.99	1.14	0.69	0.79	0.69
6) <5	5,986	5,373	4,235	6,309	1.41	1.27	0.95	0.85	0.67
				PANEL B					
7) Row (1) - Row (2)	+5,934	+974	+3,601	+4,590					
8) Row (2) - Row (3)	+291	+905	+633	+1,628					
9) Row (3) - Row (4)	+83	+278	+77	+872					
10) Row (4) - Row (5)	+1,687	+364	+1,207	+271					
11) Row (5) - Row (6)	-1,449	-234	+292	+217					

TABLE III-6

Average Income of Migrants by Level of Education for Ins, Outs, Stayers and ROC, and Ratios of Average Income Between These Groups, Employed Males, Born Elsewhere, Without Vocational Training, 1971

Level of Education	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
				PANEL A					
1) 5+ Post Sec.	12,198	13,278	21,635	14,490	0.56	0.61	0.84	0.92	1.49
2) 3-4 Post Sec.	8,947	9,863	10,577	9,758	0.85	0.93	0.92	1.01	1.08
3) 1-2 Post Sec.	8,945	7,795	8,082	6,775	1.11	0.96	1.32	1.15	1.19
4) 9-13	8,284	7,662	8,488	6,657	0.98	0.90	1.24	1.15	1.28
5) 5-8	7,305	5,878	7,362	6,223	0.99	0.80	1.17	0.94	1.18
6) <5	5,385	5,539	5,477	5,355	0.98	1.01	1.01	1.03	1.02
				PANEL B					
7) Row (1) - Row (2)	+3,251	+3,415	+11,058	+4,732					
8) Row (2) - Row (3)	+2	+2,068	+2,495	+2,983					
9) Row (3) - Row (4)	+661	+133	-406	+118					
10) Row (4) - Row (5)	+979	+1,784	+1,126	+434					
11) Row (5) - Row (6)	+1,920	+339	+1,885	+868					

between the two classes of migrants. For out-migrants when born in Newfoundland the ratios are less than 1.0. The same holds for non Newfoundland born migrants, although it is worth noting that average incomes for those born elsewhere for both Outs and Stayers is higher than for those born in Newfoundland. Thus within each class of migrant some income is lost due to departure from the province. Part of the loss may be due to the interaction of age and migration but it may also be due to the short time that the out-migrants have resided in their new province. On average they left no more than 2½ years earlier and so may not have become fully integrated into their new jobs. The drop in average income is particularly pronounced for migrants with 5 or more years of post secondary schooling. This could be accounted for by difficulty in finding suitable employment, or non-pecuniary advantages of working outside the province.

In the case of in-migrants (column 7 for each table) the ratios differ on the basis of place of birth. For those born in Newfoundland the ratios are less than 1.0 while for those born elsewhere they are in the main greater than one except for those with some university training. The implication of these findings are important in our understanding of the migration process, especially to a low income region like Newfoundland. First, apparently Newfoundlers returning home do so for reasons other than simple pecuniary again. It is not possible even with this data to give a precise explanation of these motives but obviously physic gain is involved and it may well be that some of those returning have not been able to

find jobs outside of Newfoundland. However the returning Newfoundlanders did earn higher average incomes for each level of education income than did their comparable non-migrating (Stayers) counterparts. Second, non-Newfoundland born migrants apparently are attracted by monetary gain and thus migrate primarily for economic reasons. It would be interesting to know why university graduates move to Newfoundland only to receive a lower income than they were earning in their province of origin. For those born elsewhere, but with only a public or high school level of schooling, the circumstances are quite different from post-secondary students. For those with public and high school training a fairly sizable financial inducement must be paid to attract them to the province, for example, compare column 1 of Tables III-3 and III-4.

Finally we can investigate whether the income gain from migration rises with educational level. As the evidence shows for neither the Ins nor the Outs do the income ratios, relative to the population from which they came, increase monotonically with the level of education. It is also true that the absolute income gains to migration do rise with years of schooling. This suggests that more educated people do not require greater financial incentives to migrate than do those with fewer years of schooling.

(iii) Income, Labour Force Status and Migration

This section examines the average income of migrants whether employed or unemployed at the respective census dates. Tables III-7 and III-8 show the average income of migrants and non-migrants by labour force status: i.e., those in the labour force less than fifteen years old (no income is recorded for this group); the employed; the unemployed; and those fifteen and over who are not in the labour force. The last group records some income and so it can be presumed that they worked during the preceding 12 months although they did not consider themselves as gainfully employed at the time the census was taken. Our interest here lies in the income gains to migration of the employed and the unemployed migrants.

The result which is most damaging to the hypothesis concerning the quality of in-migrants is shown in row 2, col. 5 of Table III-3. The average income of employed in-migrants is substantially greater for those born in Newfoundland but not for those born elsewhere. The latter however earn higher average incomes than either Ins or Stayers who were born in the province. It is hard to imagine then that those who move to Newfoundland are mainly the unemployables in Canadian society at least in 1971 before the unemployment insurance system was changed. The fact is quite the opposite. In-migrants, as shown

earlier, have more training than the resident population, earn more money and have a higher probability of being employed. They serve then, albeit, in a small way to raise average incomes in the region.

The Newfoundland born out-migrants exhibit a different relationship to average incomes in their region of destination (ROC) than do those born elsewhere. In the case of the former, their income is less than the average earnings of employed persons outside of Newfoundland. As shown in Col. 8 their average income is about 90% that earned by individuals in the rest of Canada. This is not an unexpected result given the basic characteristics of out-migrants from Newfoundland - young and mainly with high school or 1-2 years post-secondary education. However, it is worth noting that the act of out-migration does have its rewards. In terms of their home population out-migrants' income ratio is 1.17. Thus they experience a positive gain in deciding to seek employment elsewhere in Canada. For those migrants born elsewhere the opposite case holds i.e., they earn less than the non-Newfoundland born non-migrants but more than the average income in their new residence outside the province. The employed in-migrants regardless of whether they were born in Newfoundland receive a positive gain on their investment in relocation.

TABLE III-7

Average Income of Migrants by Labour Force Status, for Migrants, Stayers and ROC and Ratios of Average Income Between These Classifications, Males, Born in Newfoundland, 1971

Labour Force Status	In-Migrants (1)	Out-Migrants (2)	Stayers (3)	R.O.C. (4)	Col. (1)/(3) (5)	Col. (2)/(3) (6)	Col. (1)/(4) (7)	Col. (2)/(4) (8)	Col. (3)/(4) (9)
1) <15	0	0	0	0	0	0	0	0	0
2) E	6,639	5,679	5,420	7,318	1.22	1.05	0.91	0.78	0.74
3) U	4,408	3,382	2,722	3,900	1.62	1.24	1.13	0.87	0.70
4) N	2,543	1,554	1,466	2,778	1.73	1.06	0.92	0.56	0.53

TABLE III-8

Average Income of Migrants by Labour Force Status, for Migrants, Stayers and ROC and Ratios of Average Income Between These Classifications, Males, Born Elsewhere, 1971

Labour Force Status	In-Migrants	Out-Migrants	Stayers	R.O.C.	Col. (1)/(3)	Col. (2)/(3)	Col. (1)/(4)	Col. (2)/(4)	Col. (3)/(4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1) <15	0	0	0	0	0	0	0	0	0
2) E	9,453	8,810	10,533	7,350	0.90	0.84	1.29	1.20	1.43
3) U	3,274	4,671	4,122	3,073	0.79	1.13	1.07	1.52	1.34
4) N	2,326	2,304	2,353	2,339	0.99	0.98	0.99	0.99	1.01

The unemployed Newfoundland born migrant or more properly the migrant who, having moved, subsequently became unemployed at the time of the census, exhibits an even more remarkable performance in terms of his earnings. This in-migrant group not only earns more than its counterpart who leaves Newfoundland but earns more than those non-migrants in Newfoundland who become unemployed. As in many other examples given in the first section of the chapter, the non-Newfoundland born migrants exhibit quite a different pattern. For those born elsewhere who become unemployed while in Newfoundland it means a drop in average income below their counterpart non-migrants both in the province (STAYERS) and outside (ROC).

Effect of Migration on Income: Econometric Analysis

The previous sections analyzed the effect on income of age, education level and labour force status taken separately. It is likely that there are interactions between these variables. To examine this we have constructed a series of multi-variate income determination equations. The results of these equations will allow us to investigate the effect of any one of the variables on income holding the other variables constant.

The form of the estimating equations finally settled upon closely resemble those used to explain the numbers of migrants. A separate regression was run for each of the migration status categories (Ins, Outs, Stayers, ROC). The equations were quadratic in age with slope and intercept dummies used for each of the 12 categories of education (the same 6 levels of schooling subdivided into with and without vocational training). The equation estimated for each migration status category was of the form:

$$Y_j = \sum_{i=1}^{12} a_{ij} E_i + \sum_{i=1}^{12} b_{ij} E_i A + c_j A^2 \qquad (6)$$

where Y_j is average income in migration status j (Ins, Outs, Stayers, ROC), E_i is education category i and A is age by mid-cohort point. As before, since E_i is a (0,1) variable this is equivalent to estimating separate equations for each education category and each migration status as follows:

$$Y_{ij} = a_{ij} + b_{ij} A + c_j A^2 \qquad (7)$$

The above equations would be suitable for estimating income determination equations from a data set of individual observations. Unfortunately, we do not have such microdata. Instead we have grouped data showing average income for varying numbers of persons in each education, migration and birth place status, age, and labour force status categories. Since there are different numbers of persons in each category, the errors are known to be heteroscedastic. The problem is that one is giving identical weight in the regression to average income based upon different numbers of underlying observations. The procedure for correcting for such heteroscedasticity involves giving additional weight to observations taken from larger categories.

The appropriate method for correction is as follows. Suppose that the error associated with the equation for mean income from cell j is ε_j. The mean income of cell j, Y_j, is a simple average of the incomes of the n_n persons in cell j, or

$$Y_j = \sum_{k=1}^{n_j} Y_{kj}/n_n$$

Suppose now that the errors associated with individual components of the cell are denoted ε_{kj}. The variance of ε_j can now be expressed as

$$\text{Var}(\varepsilon_j) = \frac{\text{Var } \varepsilon_{kj}}{\eta_j} = \frac{\sigma^2}{\eta_j}$$

where σ^2, is the variance of ε_{kj}, assumed constant. Since the variance of the error term in the regression using grouped data varies inversely with η_j, the OLS estimates will not be best linear unbiased.

A simple transformation will, however, eliminate the non-constancy of the residual. By multiplying all variables by η_j, the heteroscedasticity can be removed since now the new error term becomes $\varepsilon_j^* = \eta_j \cdot \varepsilon_j$ and Var $\varepsilon_j^* = \sigma^2$. Thus, the equations actually estimated are as follows:

$$\eta_{ij} Y_j = \sum_{i=1}^{12} a_{ij} \eta_{ij} E_i + \sum_{i=1}^{12} b_{ij} \eta_{ij} E_i A + {}_j \eta_{ij} A^2$$

The interpretation of the coefficients a_{ij}, b_{ij}, and c_j are identical to that for equation (7).

The coefficients a_{ij}, b_{ij} and c_j are reported in Table III-9. The equations fit quite well with most of the coefficients being highly significant as the t-statistics indicate. Except for ROC born in Newfoundland, all the intercept terms a_{ij} are negative, the co-efficients on age (b_{ij}) are positive and the coefficients on A^2 are negative. These imply that the curves relating income and age are concave for each education level and migration status as one would expect.

These results enable us to corroborate some of the cross-tabulation evidence given earlier regarding the income benefits from migration. We could, of course, use the income regressions to investigate the returns to education per se in Newfoundland as opposed to the rest of Canada. However, since that is not our primary purpose in this study we shall concentrate

TABLE III-9

1971 Census Regression Coefficients Determining Income for Employed Males (t-statistic in brackets)

PART A: BORN IN NEWFOUNDLAND

Independent Variables		a_{ij}						b_{ij}						c_j
Migration Status		5PS	3-4PS	1-2PS	9-13	5-8	L5*	5PS.A	3-4PS.A	1-2PS.A	9-13.A	5-8.A	15.A	A^2
OUTS	WV	-2905	-8179	-6438	-5697	-7836	0	648.7	786.9	710.6	674.8	713.3	565.1	-8.00
		(-0.40)	(-1.28)	(-4.13)	(-3.29)	(-1.90)	0	(2.96)	(3.21)	(9.33)	(8.54)	(4.54)	(5.95)	(-9.72)
	WOV	-10562	-10325	-6984	-6812	-6193	-9020	871.2	836.6	717.0	702.2	656.9	705.3	
		(-4.23)	(-3.97)	(-4.29)	(-6.93)	(-5.42)	(-3.14)	(9.90)	(8.41)	(9.21)	(11.71)	(10.25)	(8.00)	
INS	WV	13603	-14029	-8107	-7638	-2149	0	202.8	996.0	788.1	741.6	578.8	0	-9.40
		(0.78)	(-1.80)	(-1.92)	(-1.72)	(-.13)	0	(0.39)	(3.46)	(4.09)	(3.66)	(1.35)	0	(-4.07)
	WOV	-18919	-11881	-7478	-8856	-9480	-11616	1267.1	946.1	755.2	797.6	755.3	833.9	
		(-4.00)	(-1.67)	(-1.43)	(-2.54)	(-2.37)	(-1.20)	(6.03)	(3.31)	(3.51)	(4.32)	(3.99)	(3.04)	
STAYS	WV	-4593	-6008	-5322	-5160	-5943	-25035	621.5	630.3	569.7	566.7	541.0	961.6	-5.78
		(-0.65)	(-2.86)	(-4.64)	(-4.08)	(-2.16)	(-1.58)	(3.27)	(9.20)	(12.73)	(12.17)	(7.40)	(2.97)	(-13.24)
	WOV	-8431	-8216	-7088	-5911	-5979	-8608	761.1	678.5	627.7	563.5	521.3	559.0	
		(-4.85)	(-5.63)	(-7.02)	(-8.70)	(-8.02)	(-6.40)	(13.20)	(12.84)	(15.08)	(15.99)	(14.37)	(13.40)	
ROC	WV	12130	7302	6410	6286	6700	14741	-26.30	-7.46	-34.41	-37.59	-71.56	-263.26	2.10
		(0.72)	(1.13)	(1.77)	(1.64)	(0.89)	(0.42)	(-.06)	(-.04)	(-.26)	(-0.27)	(-0.34)	(-0.37)	(1.71)
	WOV	7701	6150	4599	5801	7656	10410	76.87	0.84	14.57	-47.74	-119.77	-192.18	
		(1.41)	(1.10)	(1.17)	(2.54)	(2.95)	(1.58)	(0.46)	(-0.05)	(0.10)	(-0.46)	(-1.09)	(-1.15)	

* The category L5WV gives unreliable results since there are very few observations.

TABLE III-9

PART B: BORN ELSEWHERE

Independent Variables		a_{ij}						b_{ij}						c_j
Migration Status		5PS	3-4PS	1-2PS	9-13	5-8	L5*	5PS.A	3-4PS.A	1-2PS.A	9-13.A	5-8.A	15.A	A^2
OUTS	WV	-25374	-18502	-7073	-10787	-6712	0	1416.9	1207.2	879.8	953.0	767.7	0	-10.32
		(-2.73)	(-6.14)	(-3.27)	(-4.78)	(-1.44)	0	(4.75)	(11.32)	(9.56)	(9.80)	(5.46)	0	(-9.79)
	WOV	-8712	-13173	-13643	-11113	-9051	-14663	1016.7	1059.9	1050.9	947.3	824.4	932.7	
		(-3.25)	(-5.84)	(-6.92)	(-7.48)	(-3.93)	(-2.84)	(10.02)	(11.42)	(11.50)	(11.74)	(8.89)	(6.03)	
INS	WV	-14652	-12425	-9211	-9187	-2639	0	1065.7	1037.5	908.7	975.8	792.5	729.3	-10.77
		(-2.83)	(-3.58)	(-3.14)	(-3.16)	(-0.27)	0	(6.13)	(7.18)	(6.78)	(7.33)	(3.14)	(5.94)	(-6.54)
	WOV	-18503	-16012	-11278	-9338	-9050	-9526	1290.7	1161.3	1021.3	931.3	879.3	864.0	
		(-6.53)	(-5.95)	(-4.37)	(-4.33)	(-2.38)	(-1.44)	(9.57)	(8.76)	(7.91)	(7.74)	(5.90)	(4.58)	
STAYS	WV	-6358	-3074	-5498	-3290	-12122	0	808.9	648.2	705.8	652.1	825.3	0	-7.21
		(-0.20)	(-0.23)	(-0.67)	(-0.35)	(-0.57)	0	(1.12)	(1.64)	(2.31)	(2.02)	(1.54)	0	(-2.34)
	WOV	-14537	-12659	-8189	-6334	-6047	-10711	1236.8	931.1	756.0	692.7	649.0	707.5	
		(-1.90)	(-1.64)	(-1.05)	(-1.08)	(-0.81)	(-0.66)	(4.20)	(3.12)	(2.58)	(2.52)	(2.30)	(1.71)	
ROC	WV	-2106	-300	-1256	-309	411	-269	500.0	380.6	377.1	349.1	302.9	301.4	-3.07
		(-0.21)	(-0.09)	(-0.49)	(-0.12)	(-0.09)	(-0.01)	(2.04)	(3.86)	(4.47)	(4.24)	(2.57)	(0.75)	(-4.18)
	WOV	-7321	5429	-4590	-2372	-407	-1242	708.9	553.0	470.1	382.2	298.4	296.3	
		(-2.26)	(-2.30)	(-2.32)	(-1.94)	(-0.23)	(-0.34)	(7.18)	(6.75)	(6.22)	(6.33)	(4.29)	(3.13)	

instead on the income benefits from migration.

i) The Income Effects of Migration by Education Category

The age-earnings profiles reported in Table III-5 enable us to compare predicted average incomes of persons of the same age and education level but different migration statuses. This will be an indication of the extent to which changes in migration status will account for changes in income. For education level i the difference in income as one goes from migration status k to migration status j is obtained from equation (7) as follows:

$$Y_{i,j-k} = Y_{ij} - Y_{ik} = (a_{ij} - a_{ik}) + (b_{ij} - b_{ik})A + (c_j - c_k)A^2$$

$$i = 1, \ldots, 12 \qquad (8)$$

These differences $Y_{i,j-k}$ calculated for alternate pairs of migration statuses are presented in Table III-10. For purposes of illustration the income differences for representative ages (25, 40 and 55) are also calculated. We shall consider those born in Newfoundland and those born elsewhere in turn.

a) Born in Newfoundland

The income differences indicate, for each education category, the differences in income attainable to Newfoundlanders from changing migration status at various ages. For example, consider the Outs' minus the Stayers' average income. This gives the income gain from out-migrating at various ages. There are three things to notice about these income gains. The first is that they tend to be positive for all education levels except for 5PS. This indicates that within five years of leaving Newfoundland those

TABLE III-10

1971 Census Results - Changes in Average Income Due to Changes in Migration Status

PART A: Born in Newfoundland

		5PSWV	5PSWOV	34PSWV	34PSWOV	12PSWV	12PSWOV	913WV	913WOV	58WV	58WOV	L5WV*	15WOV	(Age)^2
Outs		1688	-2131	-2171	-2109	-1116	104	-537	-901	-1893	-214	25035	-412	-2.22A^2
-Stays		+27.2A	+110A	+157A	+158A	+141A	+89A	+108A	+139A	+172A	+136A	-397A	+146A	
ΔIncome	25	981	-769	367	454	1022	942	776	1187	1020	1799	-	1851	
at Age	40	-776	-1283	557	659	972	72	231	1107	1435	1674	-	1876	
	55	-3532	-2797	-252	-135	-77	-1717	-1313	29	852	551	-	903	
Ins		18196	-10488	-8021	-3665	-2785	-390	-2478	-2945	3794	-3501	25035	-3010	-3.62A^2
-Stays		-419A	+506A	+366A	+268A	+218A	+128A	+175A	+234A	+38A	+234A	-962A	+275A	
ΔIncome	25	5446	-101	-1134	773	403	548	-366	643	2482	87	-	1603	
at Age	40	-4356	3960	827	1263	143	-1062	-1270	623	-478	67	-	2198	
	55	-15800	6392	1159	9980	-1746	-4301	-3804	-1026	-5067	-1582	-	1165	
Outs		-16508	8357	5850	1556	1669	494	1941	2044	-5687	3287	0	2596	+1.40A^2
-Ins		+446A	-396A	-209A	-110A	-78A	-38A	-67A	-95A	+134A	-98A	+565A	-129A	
ΔIncome	25	-4483	-668	1500	-319	595	419	1141	544	-1462	1712	-	246	
at Age	40	3572	6608	-270	-604	789	1214	1501	484	1913	1607	-	-324	
	55	12257	-9188	-1410	-259	1614	2639	2491	1054	5918	2132	-	-264	
Outs		-15035	-18263	-15481	-16475	-12848	-11583	-11983	-12613	-14536	-13849	-14741	-19430	-10.10A^2
-ROC		+675A	+794A	+794A	+836A	+745A	+702A	+712A	+750A	+785A	+777A	+828A	+897A	
ΔIncome	25	-4473	-4726	-1944	-1888	-536	-346	-496	-176	-1224	-737	-	-3318	
	40	-4195	-2633	119	805	792	337	337	1227	704	1071	-	-290	
	55	-8463	-5146	-2364	-1048	-2426	-3526	-3376	-1916	-1914	-1667	-	-648	
Ins		1473	-26620	-21331	-18031	-14517	-12077	-13924	-14657	-8849	-17136	-14741	-22026	-11.50A^2
-ROC		-229A	+1190A	-1003A	+946A	+823A	+741A	+779A	+845A	+650A	+875A	+263A	+1026A	
ΔIncome	25	11	-4058	-3444	-1569	-1130	-740	-1637	-720	214	-2449	-	3564	
as Ages	40	-7767	2580	389	1409	3	-837	-1164	743	-1249	-536	-	614	
	55	-20720	4043	-954	-789	-4040	-6110	-5867	-2970	-7887	-3799	-	-384	

TABLE III-10 PART A: (Continued)

		5PSWV	5PSWOV	34PSWV	34PSWOV	12PSWV	12PSWOV	913WV	913WOV	58WV	58WOV	L5WV*	L5WOV	$(Age)^2$
Stays		-16723	-16132	-13310	-14366	-11732	-11687	-11446	-11712	-12643	-13635	-39776	-19018	$-7.88A^2$
-ROC		+648A	+684A	+638A	+678A	+604A	+613A	+604A	+611A	+613A	+641A	+1225A	+751A	
ΔIncome	25	-5448	-3957	-2285	-2341	-1157	-1287	-1271	-1362	-2243	-2535	-	-5168	
at Ages	40	-3411	-1380	-398	146	-180	225	106	120	-731	-603	-	-1586	
	55	-7114	-2349	-2057	-913	-2349	-1809	-2063	-1944	-2765	-2217	-	-1550	

* The category L5WV is unreliable because there are very few persons in this category.

TABLE III-10

1971 Census Results: Changes in Average Income due to Changes in Migration Status

PART B: Born Elsewhere

		5PSWV	5PSWOV	34PSWV	34PSWOV	12PSWV	12PSWOV	913WV	913WOV	58WV	58WOV	L5WV*	L5WOV	$(Age)^2$
Outs		-19016	5825	-15428	-514	-1575	-5454	-7497	-4779	5410	-3004	0	-3952	$-3.11A^2$
-Stays		+608A	-220A	+559A	+129A	+174A	+295A	+301A	+255A	-58A	+175A	+0A	+225A	
ΔIncome	25	-5760	-1619	-3397	767	831	-23	-1916	-348	2016	-573	-	-271	
at Ages	40	328	-7951	1956	-330	409	1370	-433	445	-1886	-980	-	72	
	55	5016	-15683	5909	-2827	-1413	1363	-350	-162	-7188	-2787	-	-985	
Ins		-8294	-3966	-9351	-3353	-3713	-3089	-5897	-3004	9483	-3003	0	1185	$-3.56A^2$
-Stays		+257A	+54A	+389A	+230A	+203A	+265A	+324A	+237A	-33A	+230A	+729A	+157A	
ΔIncome	25	-4094	-4841	-1851	172	-863	1311	-22	596	6433	522	-	2885	
at Ages	40	-3710	-7502	513	151	-1289	1815	1367	780	2467	501	-	1769	
	55	-4928	-11765	-1275	-1472	-3317	717	1154	-738	-3101	-1122	-	-949	
Outs		-10722	9791	-6077	2839	2138	-2365	-1600	-1775	-4073	-1	0	-5137	$0.45A^2$
-Ins		+351A	-274A	+170A	-101A	-29A	+30A	-23A	+16A	-25A	-55A	-729A	+69A	
ΔIncome	25	-1666	3222	-1546	595	1694	-1334	-1894	-1094	-4417	-1095	-	-3131	
at Ages	40	4038	-449	1443	-481	1698	-445	-1800	-415	-4353	-1481	-	-1657	
	55	9944	-6640	4634	-1355	1904	646	-1504	466	-4087	-1665	-	19	
Outs		-23268	-1391	-18202	-18602	-5817	-9053	-10478	-8741	-7123	-8644	269	-13421	$-7.25A^2$
-ROC		+917A	+308A	+827A	+507A	+503A	+581A	+604A	+565A	+465A	+526A	-301A	+636A	
ΔIncome	25	-4874	1778	-2058	-10458	2227	941	91	853	-29	-25	-	-2052	
at Ages	40	1812	-671	3278	-9922	2703	2587	2082	2259	-123	796	-	419	
	55	5236	-6382	5352	-12648	-83	971	811	403	-3479	-1645	-	-372	
Ins		-12546	-11182	-12125	-21441	-7955	-6688	-8878	-6966	-3050	-8643	269	-8284	$-7.70A^2$
-ROC		+566A	+582A	+657A	+608A	+532A	+551A	+627A	+549A	+490A	+591A	+428A	+568A	
ΔIncome	25	-3209	-1445	-513	-11054	532	2274	1984	1946	4387	1319	-	1103	
at Ages	40	-2226	-222	1835	-9441	1005	3032	3882	2674	4230	2677	-	916	
	55	-4709	-2465	717	-11294	-1988	324	2314	-64	607	569	-	-337	
Stays		-4252	-7216	-2774	-18088	-4242	-3599	-2981	-3962	-12533	-5640	269	-9469	$-4.14A^2$
-ROC		+309A	+528A	+268A	+378A	+329A	+286A	+303A	+311A	+522A	+351A	-301A	+411A	
ΔIncome	25	885	3396	1338	-11226	1395	963	2006	1225	-2071	547	-	-1782	
at Ages	40	1484	7280	1322	-9592	2294	1217	2515	1854	1723	1776	-	347	
	55	219	9300	-558	-9822	1329	-393	1160	619	3653	1141	-	612	

* The category L5WV is unreliable because there are very few persons in this category.

employed elsewhere received income increases relative to what they would earn as non-migrants. The fact that the 5PS category shows a negative gain could reflect the fact that these persons could not find jobs at home and had to migrate to seek employment elsewhere in Canada.

The second point is that the gain to migration falls with age and, in fact, tends to be negative at the higher age groups. One might have expected this given that as persons have been in the labour force for some time they acquire specific skills that cannot readily be rewarded elsewhere. It seems to be better to migrate at a younger rather than an older age, and it is not surprising that most out-migrants are young.

The final point to notice about the comparison between Outs and Stayers is that the income gain from migrating tends to fall with education level. It is around $1800 per year in the lower education levels and falls to around $400 per year in the 3-4 PS category. For the largest category, 9-13 WOV, it is over $1000. This decline could reflect the fact that labour markets function more efficiently for the more highly educated as a result of such factors as the wider spread availability of information and the greater portability of skills. It could also simply reflect the relative shortage of employment opportunities at the higher education levels.

The comparison of ROC with Stayers indicates how well the out-migrants have fared after being away from Newfoundland for more than five years. As the category STAYS-ROC indicates these out-migrants appear to have acquired income gains considerably larger than those leaving during the past five years. In the younger income groups they tend to be well over $1000 per year and often well over $2000. This would seem to indicate that the large gains from out-migration are long-term gains occurring mainly after five years.

There is some indication that the gains eventually fall off since they are lower at higher ages.

These results are confirmed if we compare ROC with Outs. The category OUTS - ROC indicates the income gain at various ages from migrating within the last five years to that obtained from migrating more than five years earlier. As the Table indicates, the ROC category tends to have higher incomes especially at ages under 40 and again at higher ages. This confirms that the earlier one migrates the better from an income point of view. All in all, these results are fully consistent with the view of migration as being of the nature of an economic investment decision.

The results in Table III-10 also enable us to observe how well the return migrants fare relative to the non-migrants. For example, the row INS-STAYS compares the incomes of persons of given age and income who return to Newfoundland with those who did not leave (or returned more than five years before). The results are somewhat mixed with some positive and some negative with a predominance of positive numbers. In the most populous migrating category, 9-13 WOV, the results show a small positive gain (= $640 per year) at all but the highest age categories. As a generalization one might say that the income gains from in-migration to those born in Newfoundland are positive but somewhat lower than one might have expected. The fact that they are positive reflects the fact that these persons have gone elsewhere in Canada, acquired skills and experience, and have returned more qualified than their peers who have remained at home. On the other hand, the fact that the income return from in-migration is smaller than that accruing to out-migration reflects the fact that these are returnees for whom the lure of returning home is of a non-monetary sort. They have

gone out, earned higher incomes while away, and returned home presumably with some wealth accumulated. Newfoundland loses these persons at a productive stage of their working life, but at the same time regains them as more qualified members of the labour force at a later age.

The fact that return migrants are not motivated primarily by income gain is confirmed when we look at the category INS - ROC. Here we find some tendency for the income gain to those migrating to be negative. These Newfoundlanders would have earned slightly more had they stayed in the rest of Canada but they chose instead to return home and earn slightly less. There is a non-pecuniary attraction to returning to Newfoundland.

b) Born Elsewhere

By contrast, we can observe the pattern of income gains for migrants into and out of Newfoundland who were born elsewhere. The category INS-ROC gives the income gain from migrating to Newfoundland. Table III-10, Part B shows large positive gains except at the highest education levels (over 3 years post-secondary) and except at the highest age levels. These results are not unlike those observed for the case of Newfoundlanders migrating out although the magnitude of the gains appear to be considerably larger here.

The income gains recorded for the Stayers compared with those remaining in the rest of Canada tell us what the longer term income returns are like. These remain positive as before in the lower education categories and now become positive in the higher levels as well. There is thus some indication that the returns to migrating to the highly educated are mainly of a long term nature. However, for those in the remaining categories, the income gains do not appear to be much different than those obtained in the

first five years of migration. If anything they are smaller. Thus, the gains from migration persist into the longer term albeit at a slightly lower level. These results are confirmed by the category INS-STAYS which shows a slight tendency for recent in-migrants to have higher incomes than those who came in more than five years before.

The return migrants to the rest of Canada are picked up in the category OUTS. Comparing out-migrants with stayers gives the income gain from returning to the rest of Canada. These differences appear to be relatively small and of mixed sign. There does not seem to be a large income gain from out-migration. This is consistent with there being non-monetary attractions for return migrants going back home. Similarly, comparing out-migrants with their non-migrating peers in the rest of Canada (ROC), the income differences are relatively insignificant. The return migrants do not seem to have lost the ability to earn income after having spent a spell in Newfoundland.

One should be somewhat cautious in drawing implications from these comparisons for those born outside Newfoundland. They represent an aggregate of persons from very diverse regions both in terms of economic status and distance from Newfoundland. A more careful analysis of the income returns to migrating to Newfoundland would require a disaggregation of the rest of Canada into separate, more homogeneous regions of origin.

ii) Income Comparisons between those Born in Newfoundland and Those Born Elsewhere

Table III-11shows the results of subtracting the income equations for those born in Newfoundland from those for persons born elsewhere. In

TABLE III-11

1971 Census Results: Differences in Income between Persons Born Elsewhere and Persons Born in Newfoundland

		5PSWV	5PSWOV	34PSWV	34PSWOV	12PSWV	12PSWOV	913WV	913WOV	58WV	58WOV	L5WV	L5WOV	$(Age)^2$
Outs		-22469 +768A	1850 +146A	-10323 +420A	-2848 +223A	-635 +169A	-6659 +334A	-5090 +278A	-4301 +245A	1124 +54A	-2858 +168A	0 -565A	-5643 +227A	$-2.32A^2$
ΔIncome at Ages	25	-4719	4050	-1273	1277	2140	241	410	374	1024	-108	-	1418	
	40	4539	3978	2765	2360	2413	2989	2318	1787	-428	150	-	-275	
	55	12753	2862	5759	2399	1642	4693	3182	2156	-2924	4160	-	-176	
Ins		-28255 +863A	416 +24A	1604 +42A	-4140 +215A	-1104 +121A	-3800 +266A	-1549 +234A	-482 +134A	-490 +214A	430 +124A	0 +729A	2090 +30A	$-1.37A^2$
ΔIncome at Ages	25	-7536	160	1798	379	1065	1994	3445	2012	4004	2674	-	1984	
	40	4073	-816	1092	2268	1544	4648	5619	2686	5878	3198	-	1098	
	55	15066	-2408	-230	3541	1407	6686	7177	2744	7136	3106	-	-404	
Stays		-1765 +187A	-6016 +476A	2934 +18A	-4443 +253A	-176 +136A	-1101 +128A	1870 +85A	-432 +129A	-6179 +284A	-68 +128A	25035 -962A	-2103 +149A	$-1.43A^2$
ΔIncome at Ages	25	2016	4490	2490	988	2330	1205	3101	1908	27	2238	-	728	
	40	3427	10736	1366	3389	2976	1731	2982	2449	2893	2764	-	1569	
	55	4194	15838	-402	5146	2978	1613	2219	2346	5115	2646	-	1766	
ROC		-14236 +526A	-15022 +632A	-7602 +388A	-721 +552A	-7666 +412A	-9189 +456A	-6595 +387A	-8173 +430A	-6289 +374A	-8063 +418A	15010 +565A	-11652 +488A	$-5.17A^2$
ΔIncome at Ages	25	-4317	-2453	-1133	9848	-597	-1020	-151	-654	-170	-844	-	-2683	
	40	-1468	1986	-354	7551	542	779	613	755	399	385	-	-404	
	55	-945	4099	-1901	14000	-645	252	-950	-162	-1358	-712	-	-451	

addition calculations are done of the difference in income of those born elsewhere less those born in Newfoundland for persons of age 25, 40, and 55 by education level and migration status. Once again, we must be cautious in attributing too much to these results since those born elsewhere are not a homogeneous group.

These results show some rather interesting tendencies. Consider first the categories STAYS and ROC. The income comparisons for the stayers show that stayers who were born elsewhere and migrated in more than five years before do considerably better on income grounds than do those born in Newfoundland. This is true even at the lower education levels. At the same time, interestingly enough, the ROC comparison shows that Newfoundlanders who migrated more than five years ago tend to have higher income levels than non-migrants born in the rest of Canada except the category 3-4 PS WOV. These results tend to indicate that, in general, persons who have migrated tend to do better than persons who have not migrated for a given place of residence. This is a rather interesting result and may reflect a higher level of natural talent for migrants than non-migrants. Or, it may reflect the fact that the migration process leads to a better matching of workers with jobs.

Comparisons within migrating categories are found in the rows for OUTS and INS. The latter category shows a strong tendency for in-migrants born elsewhere have much higher incomes than return migrants to Newfoundland. This is consistent with the fact that in-migrants born elsewhere must be attracted by income gains while return migrants obtain non-pecuniary advantages from coming back home.

On the other hand, out-migrants from Newfoundland who were born elsewhere also tend to have higher incomes (though less than for INS) than Newfoundlanders going out to the rest of Canada. This is so except for lower education levels (L5 and 5-8).

Overall, these results suggest that in terms of income, Newfoundlanders do less well than non-Newfoundlanders, migrants do better than non-migrants, and now in-migrants to Newfoundland do better than return migrants.

iii) The Influence of Education Levels on the Income Returns to Migration

One further potential bit of information can be gleaned from the regression estimates. They can be used to estimate whether the return to migration rises with education level or not. That is, is there a greater financial incentive for the highly educated to migrate than for the lesser educated? The expression for the income returns to migration is given by equation (8) and the results presented above in Table III-10. In order to determine the effect on the returns to migration from changes in the education level we subtract ΔY for, say, education level i from that for level h. Thus, the effect on the return to migration from changing education levels from i to h is:

$$\Delta Y_{h,j-k} - \Delta Y_{i,j-k} = (a_{hj} - a_{hk}) - (a_{ij} - a_{ik}) + [(b_{hj} - b_{hk}) - (b_{ij} - b_{ik})]A \qquad (9)$$

In Table III-12 we have reported this difference for some pairs of migration status and for the movement through the six education categories without vocational training. Results are given both for those born in Newfoundland

TABLE III-12

Education Level for Selected Pairs of Migration Status (Employed Males without Vocational Training)

PART A: BORN IN NEWFOUNDLAND

Change in Migration Status	Change in Education	5PS-3-4PS	3-4PS-1-2PS	1-2PS-9-13	9-13-5-8	5-8-L5
Outs -Stays	Change in Return	-22-48A	-2213+69A	1005-50A	-687+3A	198-10A
	Break-even Age	(-)	32(-)	20(+)	(+)	20(+)
Ins -Stays	Change in Return	-6823+288A	-3275+140A	2555-106A	556+0A	-491-41A
	Break-even Age	24(-)	23(-)	24(+)	(+)	(-)
Outs -ROC	Change in Return	-1788-42A	-4892+134A	1030-48A	1236-27A	5581-120A
	Break-even Age	(-)	37(-)	21(+)	49(+)	47(+)
Ins -ROC	Change in Return	-8589+244A	-5954+205A	2580-104A	2479-30A	4890-151A
	Break-even Age	35(-)	29(-)	25(+)	83(+)	32(+)

TABLE III-12

Changes in the Return to Migration by Education Level for Selected Pairs of Migration Status

PART B: BORN ELSEWHERE

Change in Migration Status	Change in Education	5PS-3-4PS	3-4PS-1-2PS	1-2PS-9-13	9-13-5-8	5-8-L5
Outs -Stays	Change in Return	6339-349A	4940-166A	-675+40A	-1775+80A	948-50A
	Break-even Age	18(+)	30(+)	17(-)	22(-)	19(+)
Ins -Stays	Change in Return	-613-176A	-264-35A	-85+28A	-1+7A	-4188-73A
	Break-even Age	(-)	(-)	3(-)	0	57(-)
Outs -Ins	Change in Return	6952-173A	5204-131A	-590+14A	-1774+71A	5136-94A
	Break-even Age	38(+)	40(+)	42(-)	25(-)	55(+)
Ins -ROC	Change in Return	10259-26A	-14753+57A	278+28	1677-42A	-359+23A
	Break-even Age	395(+)	259(-)	(+)	40(+)	16(-)

and those born elsewhere.

a) Born in Newfoundland

Consider first the income differences for out-migrants from Newfoundland given in the row Outs-Stays. The income differences depend on age. For example, for the change from 9-13 to 1-2PS the change in the income gain from migration is 1005-50A. The breakeven age reported in the table is 20. That is the age at which the change in the income gain is zero. The positive sign in brackets means that for ages below 20 the change is positive while above it is negative. A negative sign indicates the opposite. The table reports the change in income gains from changing education levels and the age at which the change is zero.

Consider now those between the ages of 20 and 32 in the out-migrant category (OUTS-STAYS). The pattern of signs on the effect of increasing education on the returns to migration is as follows:

5PS-	3-4PS-	1-2PS-	9-13-	5-8-
3-4PS	1-2PS	9-13	5-8	L5
-	-	-	+	-

There is neither a monotonic increase nor decrease in the returns to migration as education levels rise. At the higher education levels the returns to migration fall with education level. This may simply reflect the fact that the more highly educated are more mobile to begin with so that the incentive to migrate need not be as high (even in absolute terms) to reduce migration. Also, it may be the case that the returns to migration for the highly educated occur mainly more than five years after the migration. As one moves above age 32, the pattern changes (- + - + -). The previous

tendency for the short run return to migration to fall with education level no longer exists for persons that migrate in their 30's and solder.

Whether or not the pattern is any different in the long run can be gleaned from the comparison of OUTS and ROC. Recall that ROC includes all persons who migrated out of Newfoundland more than five years ago. The pattern obtained between the ages 21 and 37 is (- - - + +). Since ROC tend to have higher incomes than Outs, if we revise the direction of subtraction to ROC - OUTS we get the pattern (+ + + - -). It would appear to be the case that, contrary with the short run, the long run returns to migration tend to rise with education level. Persons in the higher education categories tend to get their returns from migration after a relatively longer period of time.

The patterns obtained for the return migrants (INS) as compared with both Stayers and those remaining in the rest of Canada do not show any monotonic tendency for the gains to rise or fall with education level. Of course, as mentioned in an earlier section, return migrants do not get significant gains anyway. They return for primarily non-pecuniary motives.

In summary, there appears to be some tendency for out-migrants born in Newfoundland to obtain short-run gains which fall with education level but longer-term gains which rise with education level. On the other hand, for return migrants no monotonic pattern emerges.

b) Born Elsewhere

The short-run income gains from migrating to those born outside Newfoundland is given by the comparison between INS and ROC. To see if these gains rise or fall with education level we observe the last row in

Part B of Table III-12. For persons between 16 and 40 years of age the pattern which emerges is:

5PS-	3-4 PS-	1-2PS-	9-13-	5-8-
3-4PS	1-2PS	9-13	5-8	L5
+	-	+	+	+

While the pattern is not monotonic, the short term gains from migration rise with education level except for the category 3-4PS minus 1-2PS. This is in contrast with the results found for those born in Newfoundland.

The tendency is still present in the long run. The pattern for INS-STAYS is (- - - 0 -);in other words, for STAYS-INS it is (+ + + 0 +). This indicates that for those who have been in Newfoundland for over five years but were born elsewhere, their income gain relative to those who just arrived rises over almost all education levels.

Finally, no clear pattern emerges from the return migrants (OUTS). For example, for OUTS-STAYS, we obtain (- + + + -) between the ages 22 and 30 and (- - + + -) above 30. There is no clear tendency for the income gains from return migration to rise or fall with income level.

CHAPTER IV

The Adjustment of Labour Markets to Migration

1. Simple labour market models

Migration is a labour market phenomenon. On the one hand, changes in migration affect the labour supply and induce changes in wage rates, unemployment levels or both. On the other, one would expect migration itself to be influenced by wage rates and unemployment in the home province (Newfoundland) vis-a-vis the rest of Canada. Thus, migration affects and is affected by labour market conditions in Newfoundland. The purpose of this section is to present a model exploiting the interdependency between migration and labour market conditions and to estimate it using annual observations of the Newfoundland aggregate labour market for the period 1951-78. This model should assist us in forming a view as to, first, the influence of migration on wage rates and unemployment in Newfoundland in the short and the long run; and, second, the extent to which migration is an equilibrating device for adjusting conditions in the Newfoundland labour market to those in the rest of Canada. That is, we shall arrive at some view as to the extent to which migration can be relied on to close the relative wage gap and to even out unemployment rates between Newfoundland and the rest of Canada.

There are two prototypical views as to how migration and labour market conditions interact, or more particularly, about how labour markets in a depressed area might function. We shall label one the *neo-classical view* or *flexible wage view* and the other *the sticky wage view*. Let us present these alternate views to begin with as a preliminary to our own empirical findings. Both of these are extreme versions of the manner in which labour markets operate and we shall end up taking elements from both in our own model.

a) The Flexible Wage Version

According to the flexible wage version, the wage rate acts as an equilibrating device on domestic markets to equate the supply and demand for labour and eliminate unemployment. For the purposes of exposition here we shall present an idealized view of the aggregate labour market in Newfoundland, ignoring the non-homogeneity of labour and any interindustry differences in wages and employment conditions that may exist. We shall assume that the Newfoundland economy is a price-taking economy in the goods markets and that domestic producers are always in profit-maximizing equilibrium in the sense that they are employing all inputs such that the price of each input equals the value of its marginal product.

These assumptions allow us to concentrate our attention solely on the supply and demand conditions on the Newfoundland aggregate labour market for the purposes of exposition. The main forces at work can readily be depicted in the following diagram, Figure 1. In this diagram D is the Newfoundland demand for labour at various wage rates, while S is the supply. The demand curve reflects the demand for labour by firms in Newfoundland and slopes downward due to an assumed diminishing marginal product of labour as more labour is employed and all other inputs adjust optimally. The upward slope in the supply curve may reflect either an increase in the labour supply due to the responsiveness of net in-migration to the wage rate, or due to an increase in labour force participation. The initial equilibrium wage rate is at W_1 where the labour market equates demand and supply at L_1.

Figure 1 depicts an exogenous shift in the supply curve of labour due, say, to a shift in the migration relationship. The result is a depression in the wage to W_2, an increase in the value of Newfoundland output by L_1abL_2 and a partial

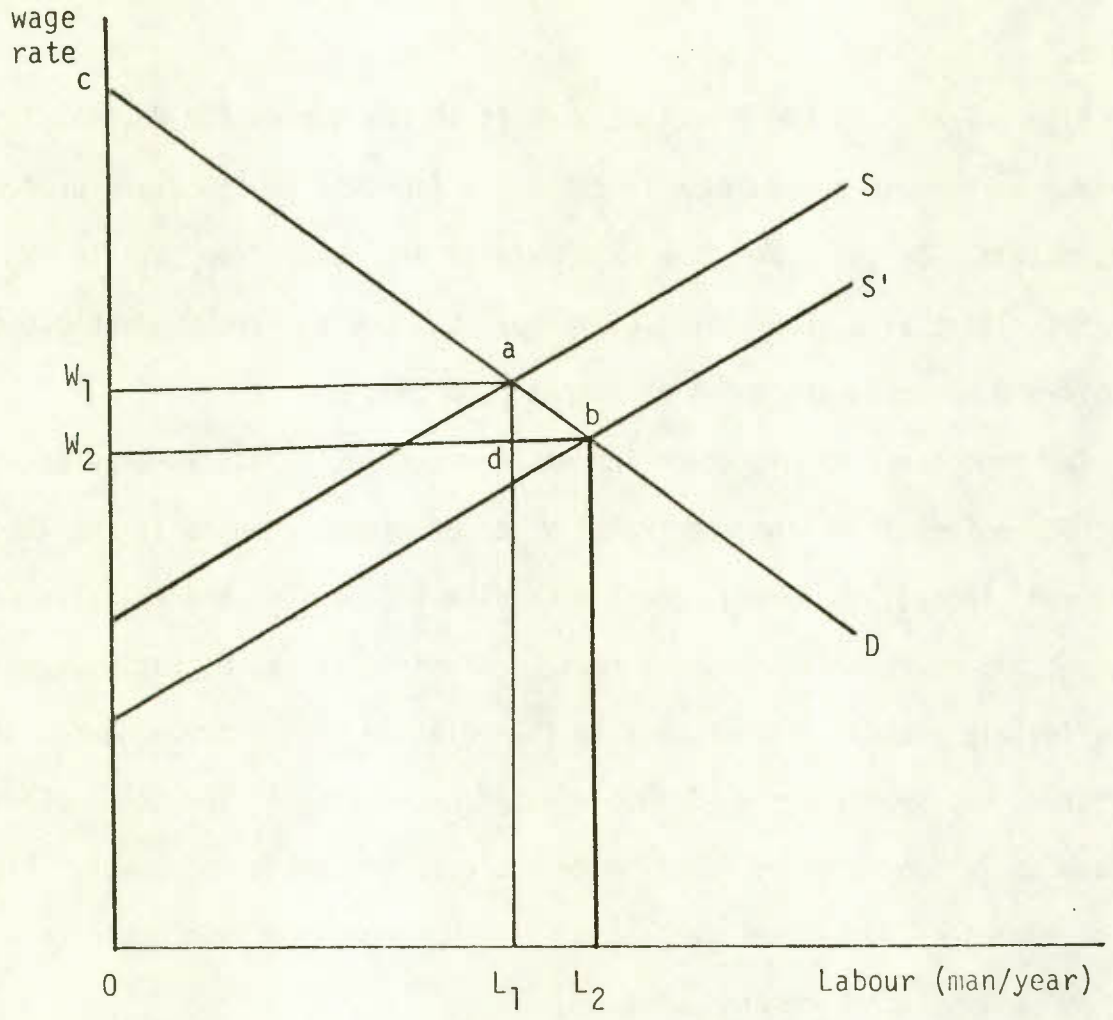


FIGURE 1

reallocation of total income from labour to other factors of production. The change in labour's total income is $(dbL_2L_1 - W_1adW_2)$ which can be positive or negative.

Figure 2 depicts the effect of a shift in the demand for Newfoundland labour due perhaps to a reduction in the price faced by Newfoundland producers for its output. In this case, the wage rate is depressed from W_1 to W_2 and the market clears at a lower level of labour L_2 making labour unambiguously worse off and reducing the value of output produced.

The importance of migration in this context is, first, as a determinant of the responsiveness of the wage rate W to exogenous changes in the labour market, and, second, as an adjustment mechanism influencing the relative earnings levels in Newfoundland and the rest of Canada. If the migration equation were infinitely elastic with respect to the relative wage between Newfoundland and Ontario, the supply curve of labour would be horizontal and the Newfoundland wage rate would bear a fixed relation to the rest of Canada wage rate. Migration would be a perfect adjustment mechanism. The Newfoundland wage would be unaffected by shifts in the demand curve.

On the other hand, the less responsive is migration to the relative wage differences the steeper will be the supply curve of labour. In this case a leftward shift in the demand curve will cause a reduction in the wage rate, the reduction being greater the less responsive is migration to the relative wage. The Newfoundland economy could thus end up with a much lower wage rate than the rest of Canada in equilibrium. Such would also be the case in a dynamic context in which the rightward shift in the labour supply curve owing to natural population increases or other demographic factors is greater than the rightward shift in the demand curve for labour in Newfoundland.

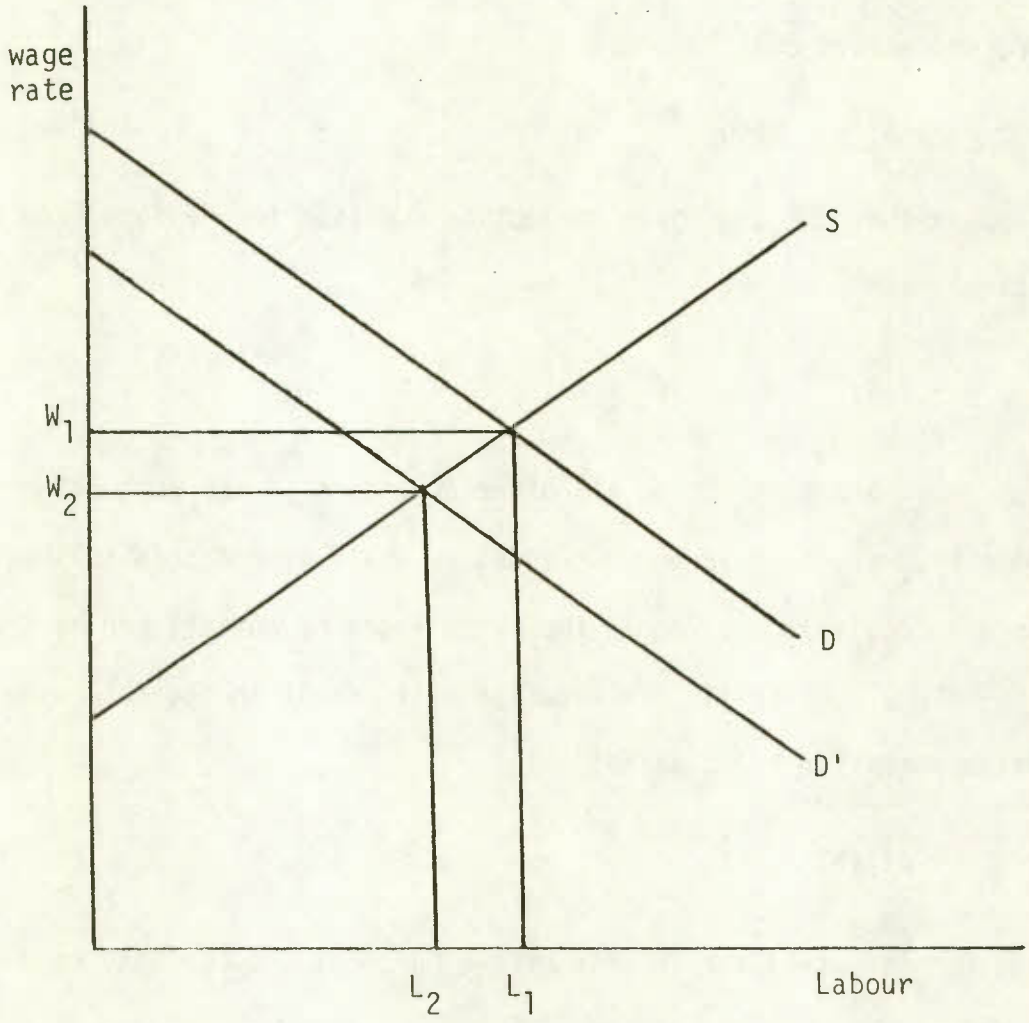


FIGURE 2

It is convenient at this point to spell out a simple algebraic version of this model as a prelude to presenting our own estimated model of the Newfoundland labour force. Let us consider separately the demand for labour, the supply of labour, and market equilibrium.

i) Demand for Labour

Suppose that the aggregate production function for Newfoundland can be written simply as:

$$X = f(N) \qquad f' > 0 \qquad f'' < 0 \tag{1}$$

At this stage we are suppressing all other arguments in the production function for simplicity. Later on in our own model we shall expand this to include other inputs such as capital. If p is the price index of output, and if Newfoundland is a price-taker, then profit maximization will result in the following marginal productivity condition being satisfied:

$$W = pf'(N) \tag{2}$$

The demand for labour is the inverse of the marginal productivity condition, or,

$$N = n(W/p) \tag{3}$$

For given p, equation (3) yields the downward sloping demand curve of Figure 1.

ii) Supply of Labour

We are ignoring variability in hours worked and are assuming that each person in the labour force supplies a given amount of work, one man-year. In addition, let us ignore changes in the participation rate for simplicity, although this will be incorporated into our empirical model presented later. That being

the case, the labour supply in any given period will be given identically by:

$$L \equiv L_{-1} + M + NIL \tag{4}$$

where L is the labour force, L_{-1} is last period's labour force, M is net in-migration over the period and NIL is the natural increase in the labour force since last period.

We may treat L_{-1} and NIL as being exogenous variables while net migration depends upon, say, the relative wage between Newfoundland and the rest of Canada. Thus,

$$M = m(W/W_0) \tag{5}$$

where W_0 is the wage rate elsewhere.

iii) Market Clearing

In this flexible wage model the wage rate in Newfoundland adjusts so as to equate labour demand and labour supply, or,

$$L = N \tag{6}$$

Equations (3) - (6) provide a system of 4 equations in 4 unknowns (W, N, L, M) which could form the basis for estimation. The results of this model could be used to simulate the effect of exogenous shocks on the Newfoundland labour market and investigate the efficacy of migration as an equilibrating device.

An alternate way to view this flexible wage system, and one which yields a system of equations corresponding to those estimated in the so-called "simultaneous-equations models of migration" in the United States is as follows.[1] Using (3), (4) and (6) we obtain:

$$n(W/p) = L_{-1} + M + NIL$$

Solving this expression for W yields:

$$W = g(p, L_{-1} + M + NIL) = L(p, M) \qquad (7)$$

This equation together with equation (5) provides two interdependent equations in M and W with each depending on the other. They could be estimated simultaneously and used as the basis for investigating the actual interaction between migration and the Newfoundland wage.

b) The Sticky Wage Version

In the extreme case of sticky wages, the wage rate is determined by factors other than the excess demand or supply of labour on the domestic labour market. Thus any changes in the demand or supply conditions will have their impact entirely on unemployment and not upon the wage rate. This is illustrated geometrically in Figures 3 and 4 for the case in which the wage rate is above the market clearing level.

In Figure 3 at the wage rate W the demand for labour is N_1 while the supply is L_1 resulting in a level of unemployment $(L_1 - N_1)$. A rightward shift in the supply curve due, say, to an exogenous change in migration will leave the wage rate unaffected and will simply increase unemployment. Conversely an increase in out-migration would appear to be beneficial since it would leave unaffected the wage rate and employment levels. Instead it would merely cause a fall in the unemployment rate. This diagrammatic treatment is perhaps overly simplistic since one might expect that the supply of labour would itself respond to the level of unemployment. Thus the increase in unemployment due to a shift in the supply curve might be mitigated by induced out-migration. In our algebraic analogue of

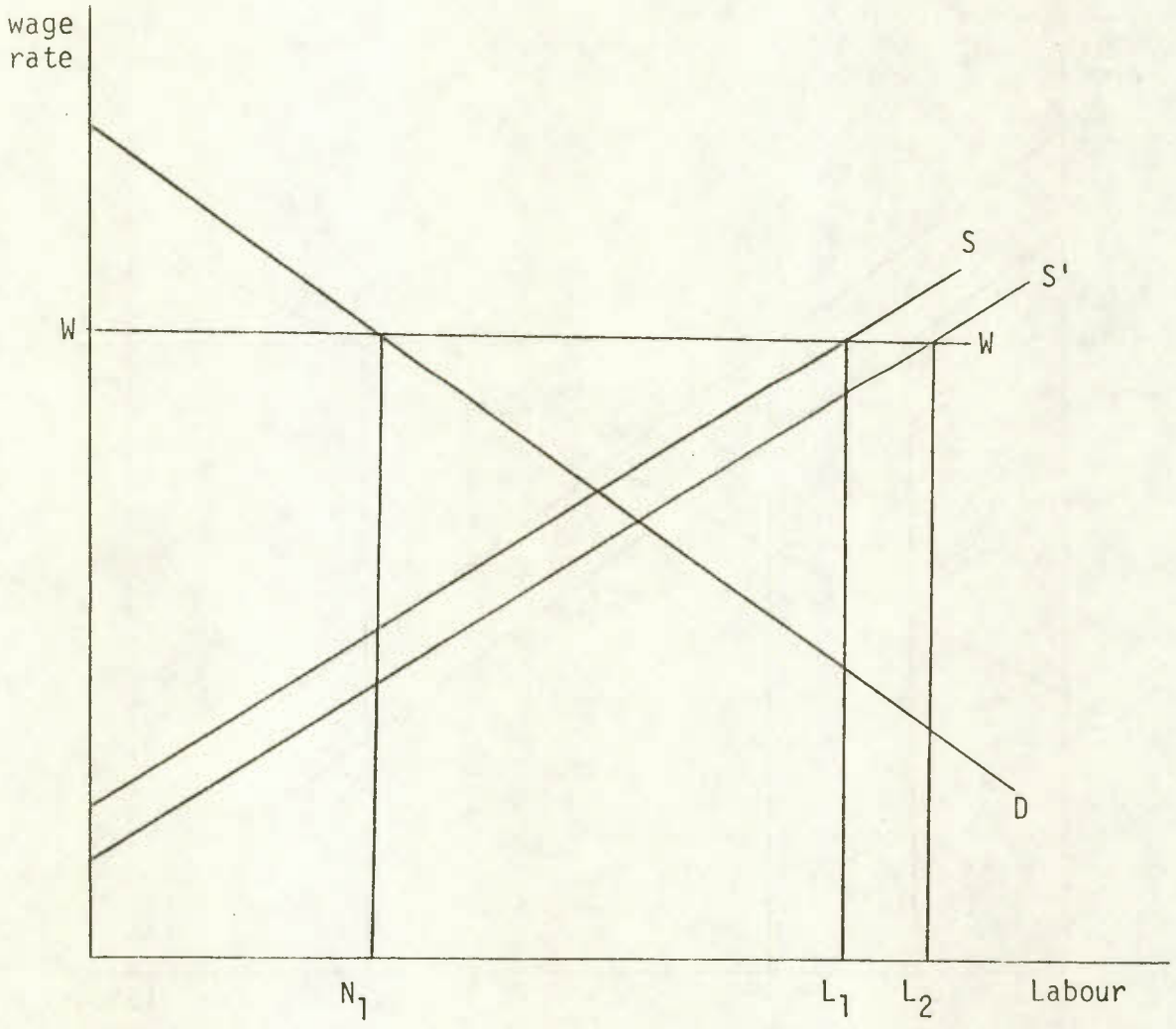


FIGURE 3

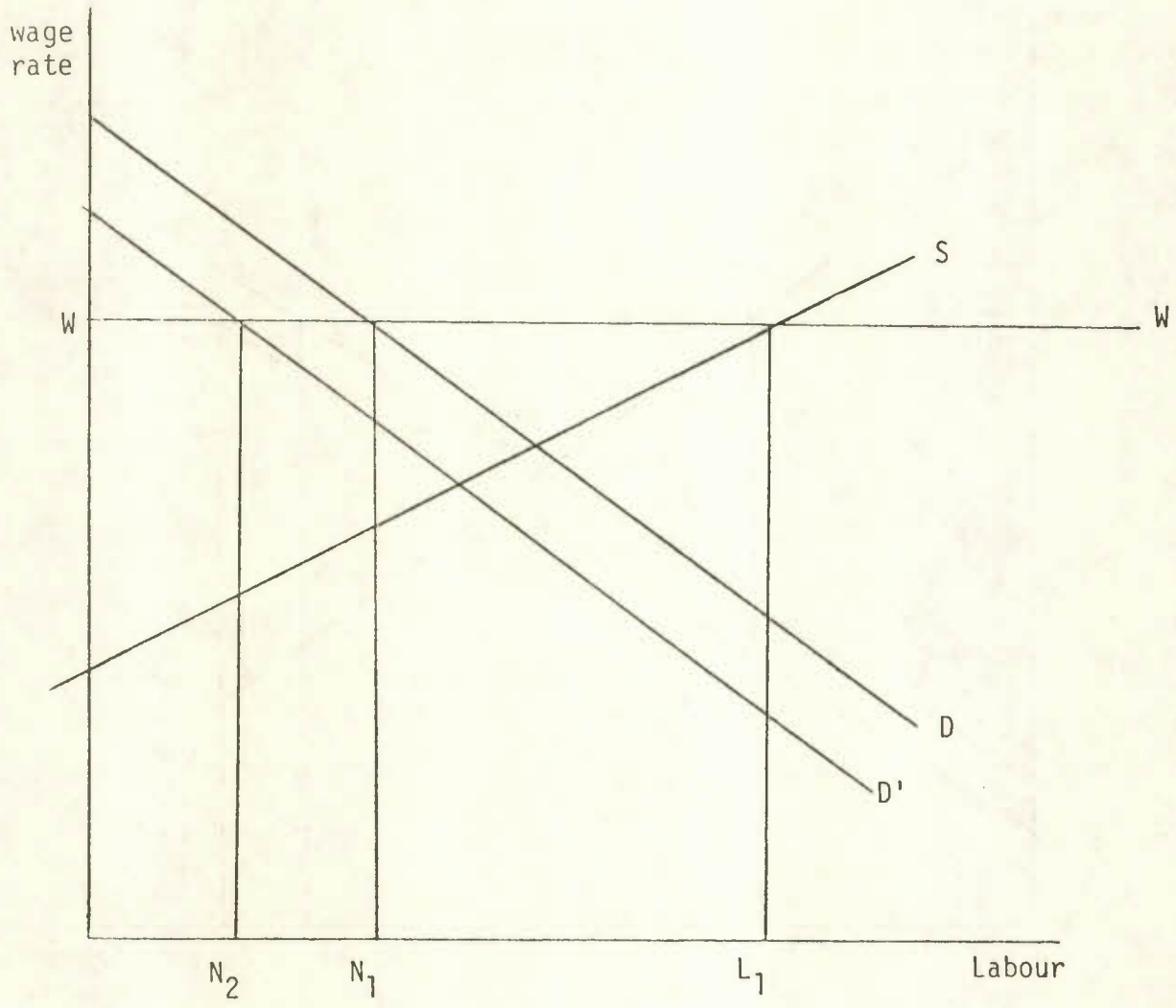


FIGURE 4

the sticky wage version below, we allow for this possibility.

Likewise, a shift in the demand curve for labour will give rise to changes in employment N but not to changes in the wage rate. Thus, a leftward shift in the demand curve from D to D' will increase unemployment by $N_1 - N_2$. Once again, this would be mitigated to the extent that migration responded to levels of unemployment. The greater is the response of migration to unemployment, the less would be the induced unemployment due to a depression in the price of Newfoundland output.

It will be instructive for later discussion if we also present an algebraic version of this model which could serve as a basis for estimation. In this case the model will consist of a wage determination equation, a demand for labour equation, and a supply of labour equation. The level of unemployment will come out as a residual of supply less demand.

i) Wage determination

In this extreme version of the sticky wage model the wage rate in Newfoundland is determined by exogenous factors which are unaffected by changes within the Newfoundland economy. For example, the wage rate might be determined by the wage in the rest of Canada, W_0, and the consumers Price Index in Newfoundland relative to the rest of Canada, CPI/CPI_0. Thus,

$$W = W(W_0, CPI/CPI_0) \qquad (8)$$

A less extreme version might allow the Newfoundland wage to respond to factors inside Newfoundland. A prime candidate might be the unemployment rate. We shall consider the addition of such factors in our empirical model below. For the purposes of the present simplified exposition the assumption of a fixed wage is retained. The wage rate is thus determined independently of the operations of the Newfoundland labour market.

ii) Demand for Labour

The demand for labour is determined by the profit-maximizing behaviour of firms in Newfoundland facing fixed output prices and the predetermined wage given by equation (8). Retaining the same aggregate production function (1) as earlier, marginal productivity condition (2) will be satisfied. When inverted we obtain the same demand for labour equation (3) yielding the demand for labour N as a function of the ratio W/p. Once again, this is a downward sloping demand curve for labour as in Figures 3 and 4.

iii) Supply of Labour

The supply of labour L is determined as in the flexible wage case. Equation (4) gives an identity relating the current labour supply to last period's labour supply, net in-migration, and natural increase in the labour force. If, for simplicity, we assume that only migration is determined endogenously, then equation (5) gives the responsiveness of the labour supply to the relative wage between Newfoundland and elsewhere.

iv) Unemployment

In this fixed wage model, labour markets do not clear. Instead labour demand and labour supply are determined separately by the exogenously-given wage rate and the level of unemployment is the residual or excess supply of labour at the going wage rate. The system of equations which would form the basis for estimating the fixed wage model would be:

$$W = W(W_0, CPI/CPI_0)$$

$$N = n(W/p)$$

$$M = m(W/W_0) \qquad (9)$$

$$L \equiv L_{-1} + M + NIL$$

$$U \equiv L - N$$

Here U is the unemployment rate.

We have now developed two polar cases of simple labour markets to indicate how migration might affect and be affected by local wage rates and unemployment. In the next section we shall present a hybrid model which formed the basis of our empirical work.

2. An Empirical Model of the Newfoundland Labour Market

We experimented with a number of alternative versions of the Newfoundland labour market. The one which is discussed in this section is that which the data best supported. It is a hybrid of the flexible wage and the fixed wage models incorporating elements of each as well as including additional determining variables not explicitly discussed in the above models. The model, on the one hand, retains a certain stickiness in the wage rate as seems to be required to generate the unemployment observed. However, on the other hand, the wage rate determined is not entirely oblivious to local labour market conditions but is influenced especially by the labour supply. In addition, we have included the participation rate as an endogenous variable. The main model we estimate is an aggregate model of the Newfoundland labour market using annual observations covering the period 1951-78. We have, however, also disaggregated the production side of the economy into broad industry groups and tested it empirically. Those results will be presented at the end of this section.

a) The Aggregate Model

The aggregate model is formally somewhat similar to the fixed wage model of Section 1 except that the wage rate is allowed to be influenced by Newfoundland labour market conditions,and an equation determining the participation rate is included. What follows is a brief discussion of the structure of the model and a subsequent presentation of the empirical results.

i) Wage Determination

The Newfoundland wage rate appears to have enough institutional rigidities built into it to preclude it from acting as a labour market clearing device. Nonetheless it may not be completely determined independent of labour market conditions in Newfoundland. Correspondingly, we have allowed two sorts of variables to influence the wage rate in our model - exogenous variables and domestic labour market conditions.

The main exogenous variables are those given in equation (8), the wage rate elsewhere and the consumers' price indices. The wage rate elsewhere, measured by the Ontario wage rate in our study, might be expected to influence the Newfoundland wage rate owing to such things as the uniformity of public sector pay over provinces, the interprovincial jurisdiction of some union contracts, and the use by unions of the Ontario wage as a bargaining benchmark in Newfoundland. The inclusion of the CPI is justified on the grounds that workers are primarily concerned with the real wage rather than the nominal wage.

There are a number of potential ways of including the CPI. Since the Ontario money wage rate, W_0, presumably also takes account of the price index in Ontario, CPI_0, we ought only to include the influence of the Newfoundland CPI over and above that of Ontario. Consequently we could use CPI/CPI_0 in the wage determination equation or the difference $CPI-CPI_0$. Alternatively, we could relate the real wage in Newfoundland to the real wage in Ontario. For the purposes of exposition here,

the former will be used. In the empirical estimates other alternatives will be reported. There are other potential exogenous variables that one could include such as the proportion of the work force in the public sector, demographic variables or skill variables. None of these appeared in our final version owing either to a lack of data or to the fact that they were empirically insignificant. However, as reported in part b below separate wage equations were run for the disaggregated production sectors in the economy.

There are potentially a large number of variables reflecting labour market conditions that could be included in the wage determination equation. On the supply side one might include the supply of labour as an independent variable. Demand conditions could be reflected in Gross Provincial Product, labour productivity, or measures of provincial fiscal policy. Or, since much of Newfoundland's output is exported, some measure of the level of economic activity outside Newfoundland might be used, such as the Canadian GNP. The combined influence of supply and demand could be represented by the unemployment rate.

After empirical experimentation, it was determined that of all the above variables only the labour supply appeared to be significant in determining the wage rate. What was particularly surprising was that neither the unemployment rate (or level) nor productivity of labour appeared as satisfactory determinants of the wage rate. In the case of the unemployment rate this may either be due to the poor quality of our unemployment data which is calculated as a difference between two large numbers - the labour force and employment. There may be large measurement errors. However, equally as likely, the unemployment rate itself may be a very imperfect indicator of the true unemployment rate. Individuals may simply not enter the labour force if the probability of finding a job is low. Regarding the labour productivity variable, our measure of aggregate labour productivity (output per worker) is not likely to be an accurate measure of technical progress owing both to aggregation problems and to the fact that changes in the

average product of labour does not reflect changes in technical progress when capital-labour substitution is occurring.

The final form of the wage determination equation which was estimated was:

$$W = W(W_0, CPI/CPI_0, L) \qquad (10)$$

where W_0 was the Ontario wage rate, CPI was the Newfoundland CPI (for which the St. John's CPI was used as a proxy), CPI_0 was the Ontario CPI (for which the Toronto CPI is a proxy), and L is the aggregate labour supply.

ii) Labour Supply

The labour supply data give the number of workers employed and not the hours worked. Consequently we neglect the issue of the effect of wage rates on the hours worked by concentrating on the supply of workers rather than hours worked. As indicated by equation (4) earlier the labour supply is determined by the rate of natural population increase and the amount of net in-migration. In addition we shall allow the participation rate, the ratio of work force to population, to be endogenously determined. Thus the labour supply is given by the following identities:

$$L \equiv \pi P \qquad (11)$$

$$P \equiv P_{-1} + M + NIP$$

where P is population, NIP is the natural increase in the population (births less deaths), and π is the participation rate.

We assume that NIP is exogenous and that π and M are determined at least partly by economic variables. The empirical model estimates these variables separately as follows.

Net Migration. There have been a number of studies investigating the determinants of interprovincial migration in Canada.[2] In these studies migration

(gross or net) has been statistically related to a large number of variables. The most obvious are the wage and unemployment rates in the sending and receiving region. Since we have constructed net migration variables from our demographic and labour force data (as explained in a later section), and since we cannot identify the other sending or receiving provinces outside Newfoundland we have simply used Ontario wage and unemployment variables. Courchene[3] has also suggested that interprovincial transfers and possibly transfers to individuals (e.g., U.I. benefits) may be important determinants of migration and we experimented with these. Finally, since other evidence indicates that particularly high migration rates occur in the 17-24 age brackets we have included a variable to represent the demographic composition of the population. The variable which seemed to perform best here was the number of Newfoundland births lagged 16 years. Thus our final net in-migration relationship was of the form:

$$M = m\left(\frac{W}{CPI}, \frac{W_0}{CPI_0}, U, U_0, T, B_{-16}\right) \qquad (12)$$

In this equation real wages in Newfoundland and Ontario are used, unemployment levels U and U_0, transfers to the Newfoundland government T and births lagged 16 years B_{-16}.

Participation Rate. Participation rate equations have also been widely estimated for Canada.[4] We used as independent variables the Newfoundland wage, the level and rate of unemployment, demographic variables such as the proportion of the population in various age brackets and the birth rate lagged 16 years, and a variable representing the generosity of the unemployment insurance system. The latter variable was what is known as the benefit replacement rate of the UI system as measured by average unemployment insurance benefits divided by average wages.[5] The general form of

the participation rate function was:

$$\pi = \pi\left(\frac{W}{CPI},\ U,\ B_{-16},\ PC14,\ b\right) \qquad (13)$$

where PC14 is the percentage of the population 14 and over and b is the unemployment insurance benefit replacement ratio.

One curious finding for both the migration and participation rate equations was that the Newfoundland unemployment rate (and level) was unimportant as an explanatory variable. Only the Ontario unemployment variable performed at all well. This will be discussed further in the empirical section. We also used the level of Ontario employment as an explanatory variable in the migration equation as an alternate to the unemployment rate or level. The failure of the Newfoundland unemployment rate to influence either M or π considerably simplifies the final estimation and interpretation of the system of equations as a whole since U itself is a dependent variable determined simultaneously in the system as a residual between labour supply and labour demand.

iii) Labour Demand

In the previous section describing the simple model we assumed output was produced from labour alone. That was for expositional purposes alone. In this model we make the more realistic assumption that output is produced by a production function involving labour and capital. As is conventional in these matters all materials, energy, and intermediate inputs are suppressed by assuming them to be used in fixed proportions. We concentrate on the estimation of the value-added part of the production process.

Assume that aggregate value-added in the Newfoundland economy can be represented by a neo-classical production function involving the inputs labour and

capital. Even this is a gross simplification since we are aggregating various types of output, labour services and capital services. Our data are,however, highly aggregated. A convenient functional form for the production function is the Constant Elasticity of Substitution (CES) production function. It has the advantage of being the most general sort of production function from which a labour demand function can be derived that can be easily estimated using linear estimation techniques. The production function is written:

$$Y = [\delta K^{-\rho} + (1 - \delta)N^{-\rho}]^{-\frac{v}{\rho}} \qquad (14)$$

where Y is real value added or real gross provincial product (GPP), K is capital and N is labour demand. The marginal product of labour can be derived from (14) to be:

$$\partial Y/\partial N = v(1 - \delta)Y^{(1 + \rho/v)}/N(1 + \rho) \qquad (15)$$

If we assume competitive profit-maximizing behaviour on the part of Newfoundland industry then the wage rate will equal the value of the marginal product of labour, $W = p\partial Y/\partial N$ where p is an industrial output price index. From (15) we obtain:

$$N^{(1 + \rho)} = v(1 - \delta)Y^{(1 + \rho/v)}/(W/p)$$

Our estimating equation for labour demand can be obtained by taking logarithms of the above expression. This yields:

$$\log N = C + g \log Y + h \log(W/p) \qquad (16)$$

This labour demand function shows the demand for labour related log-linearly to the output and the real wage[6]. Though capital (and its price) do not appear in the equation it is implicitly assumed in the derivation that both capital and labour use are determined by the marginal productivity conditions. The values of the coefficients are:

$$C = \log[v(1 - \delta)]/(1 + \rho) > 0$$

$$g = (1 + \rho/v)/(1 + \rho) > 0 \quad (\gtrless 1 \text{ as } v \lessgtr 1)$$

$$h = -1/(1 + \rho) < 0$$

iv) The System as a Whole

The entire system of wage determination, demand and supply of labour and the residual determination of unemployment is given by equations (10), (11), (12), (13), (16) and the identity $U \equiv L - N$. We have estimated these equations in linear and log-linear form. The linear form gives the following system:

$$W = \alpha_0 + \alpha_1 W_0 + \alpha_2 CPI/CPI_0 + \alpha_3 L$$

$$L \equiv \pi(P_{-1} + M + NIP)$$

$$M = \beta_0 + \beta_1\left(\frac{W}{CPI}\Big/\frac{W_0}{CPI_0}\right) + \beta_2 U_0 + \beta_3 B_{-16} + \beta_4 T \qquad (17)$$

$$\pi = \gamma_0 + \gamma_1\left(\frac{W}{CPI}\right) + \gamma_2 B_{-16} + \gamma_3 PC14 + \gamma_4 b$$

$$\log N = \delta_0 + \delta_1 \log Y + \delta_2 \log\left(\frac{W}{P}\right)$$

$$U \equiv L - N$$

In this system of equations, the endogenous variables include W, L, M, π, N and U. The remainder are treated as exogenous. This may not be too satisfactory for Y, the real gross Provincial Product in Newfoundland. We shall have to be cautious in interpreting our simulations to ensure that account is taken of the assumed exogeneity of Y. This will be returned to in our simulation exercises below.

b) The Disaggregated Model

Since we have also collected data on the output and employment by broad industry groups we estimated a disaggregated version of the above model. The model is very similar to the aggregate version in its underlying economic assumptions. However, we have to distinguish among wage rates in different industries as well as output and labour demand. The assumption is retained that homogeneous labour is supplied but different wages are offered in different industries owing to, say, different working conditions. The equations of the model are as follows, where the n industries are indexed by the subscript i.

Wage determination

$$W_i = W_i(W_0, CPI/CPI_0, L, \theta_i) i = 1, \ldots, n \qquad (18)$$

Here θ_i is labour productivity in industry i, while all other variables are as before.

Average wage rate

The Newfoundland economy-wide average wage is simply a weighted sum of industry wages:

$$W \equiv \sum_{i=1}^{n} \lambda_i W_i \qquad (19)$$

where λ_i is the proportion of the employed labour force in industry i.

Labour Supply

As before labour supply is given by the identities in (11). The estimating equations for net in-migration and the participation rate are (12) and (13) as before except that now W is the weighted average industry wage rate.

Labour Demand

Using the same CES technology as before, individual industry labour demand equations are:

$$\log N_i = C_i + g_i \log Y_i + h_i \log\left(\frac{W_i}{P_i}\right) \quad i = 1, \ldots, n \tag{20}$$

System as a Whole

$$W_i = \alpha_{0i} + \alpha_{1i} W_0 + \alpha_{2i} CPI/CPI_0 + \alpha_{3i} L + \alpha_{4i} \theta_i \quad i = 1, \ldots, n$$

$$W \equiv \sum_{i=1}^{n} \lambda_i W_i$$

$$L \equiv \pi(P_{-1} + M + NIP)$$

$$M = \beta_0 + \beta_1 \left(\frac{W}{CPI} \Big/ \frac{W_0}{CPI}\right) + \beta_2 U_0 + \beta_3 B_{-16} + \beta_4 T \tag{21}$$

$$\pi = \gamma_0 + \gamma_1 \left(\frac{W}{CPI}\right) + \gamma_2 B_{-16} + \gamma_3 PC14 + \gamma_4 b$$

$$\log N_i = \delta_{0i} + \delta_{1i} \log Y_i + \delta_{2i} \log\left(\frac{W_i}{P_i}\right)$$

$$U \equiv L - \sum_{i=1}^{n} N_i$$

Here the endogenous variables are W_i, W, L, M, π, N_i and U.

c) Empirical Estimation of the Aggregate Model

The system of equations given by (17) was estimated in several different forms. In presenting the empirical results we select only the "best" fitting equations in the sense of those with the lowest standard errors of regression.

It will be noticed immediately that, as it stands, system (17) has to be estimated using simultaneous equation techniques. The Newfoundland wage rate W and the labour supply L appear both as dependent and determining variables. However, in our empirical testing we found that the wage determination fit best when we used the lagged labour supply, L_{-1}, as the independent variable rather than L. Under this specification, the simultaneity problem vanishes. That is, if we assume that the error terms associated with the equations in (17) are independently and normally distributed, then in each equation the error term is unrelated to the independent variables. In particular, in the migration, participation rate, and labour demand equations the wage rate W is uncorrelated with the error term when L_{-1} is used in the wage determination equation. This is a well-known econometric result. The implication of this is that ordinary least squares (OLS) estimates are the best linear unbiased estimates. All the results reported below are based upon OLS estimates. The detailed explanation of the construction of variables and their source is presented in the data Appendix.

i) Wage Rate Determination

A number of alternative specifications of the wage determination equation for Newfoundland were attempted. We present here the equations for the average weekly wage which appear to fit best. Altering the specification does not appear to change the results qualitatively too much for our purposes. The t-statistics are given in brackets and those which are significant at the 95% level of confidence (using a two-tailed test) are marked with an asterisk while those significant at the 99% level have a double asterisk. As mentioned above these regressions are based on annual observations covering the period 1951-78.

$$W = 1.597 + 1.024\ W_0 + 1.21\ (CPI-CPI_0)$$
$$\quad (0.19)\ \ (14.26)^{**}\ \ (4.18)^{**}$$

(W.1)

$$-.000109\ L_{-1}$$
$$(-0.91)$$

$\bar{R}^2$ = .9953
SEE = 3.19
D.W. = 1.44
F = 1688**

$$W = 16.216 + 1.170\ W_0 - .000349\ L_{-1}$$
$$\quad (1.61)\ \ \ (14.09)^{**}\ \ \ (-2.52)^{*}$$

(W.2)

$\bar{R}^2$ = .9917
SEE = 4.23
D.W. = 0.92
F = 1443**

$$W = -142.797 + 1.052\ W_0 + 147.497\ (CPI/CPI_0) - .000153\ L_{-1}$$
$$\quad (-3.12)^{**}\ (14.01)^{**}\ \ (3.53)^{**}\ (-1.22)$$

(W.3)

$\bar{R}^2$ = .9946
SEE = 3.42
D.W. = 1.43
F = 1468**

$$W = -32.14 + .674\ W_0 + .679\ CPI - .000165\ L_{-1}$$
$$\quad (-3.07)^{**}(6.72)^{**}\ \ (5.83)^{**}\ \ \ \ (-1.78)$$

(W.4)

$\bar{R}^2$ = .9967
SEE = 2.67
D.W. = 1.66
F = 2413**

It is difficult to choose among these four equations but they are all telling basically the same story. As the equations indicate the current Newfound-

land average weekly earnings are closely related to the Ontario average weekly earnings with a coefficient near unity. Nominal wage parity appears to be a strong determining factor of the Newfoundland wage. However, the Newfoundland CPI appears to also exert a determining influence either by itself or relative to the Ontario CPI. Finally, the Newfoundland wage shows a negative relationship with the lagged labour supply. The order of magnitude is similar in all four equations but only in one is the coefficient significant using a two-tailed test (W.2). In (W.4), the coefficient is "almost significant". The magnitude of the coefficient on the lagged labour supply indicates that an increase in the labour force by 1,000 workers *ceteris paribus* will cause the wage rate in the following year to fall by between $.11 and $.35 per week. Thus the labour supply has a relatively modest influence upon the wage rate.

ii) Net Migration

As indicated in the theoretical discussion earlier there are a large number of potential influences on net-migration some of which operate on the in-migrants and others which operate on out-migrants. Unfortunately, we cannot estimate separate equations for in- and out-migrants. As explained in the Data Appendix the migration series was constructed as a residual from population and demographic data using identity (11). This gives net in-migration as the difference between gross in-migration and gross out-migration. We are restricted therefore to combining the influences on in- and out-migration in a single equation explaining net in-migration.

We present here two estimates of the net migration equation representing the best fits. Several alternate explanatory variables were tried but rejected. We shall discuss those shortly. The preferred equations are as follows:

$$M = \underset{(-2.11)*}{-14.54} + \underset{(1.50)}{13.41}\left(\frac{W}{CPI} \Big/ \frac{W_0}{CPI_0}\right) - \underset{(-5.61)*}{.802}\ B_{-16}$$

$$+ \underset{(2.31)*}{.954\ U_0} + \underset{(2.28)*}{16.94\ (UIB/W)} \qquad (M\cdot1)$$

$$\bar{R}^2 = .5975$$
$$SEE = 1.63$$
$$D.W. = 2.07$$
$$F = 10.28*$$

$$M = \underset{(-2.24)*}{-16.71} + \underset{(2.29)*}{20.76}\left(\frac{W}{CPI}\Big/\frac{W_0}{CPI_0}\right) - \underset{(-5.49)*}{.848\ B_{-16}} + \underset{(3.38)*}{1.366\ U_0} \qquad (M\cdot2)$$

$$\bar{R}^2 = .5210$$
$$SEE = 1.78$$
$$D.W. = 1.88$$
$$F = 10.06*$$

In these equations the variable U_0 refers to the Ontario unemployment rate while UIB/W is the ratio of Unemployment Insurance benefits to average weekly earnings. The latter is the so-called benefit replacement ratio similar to that used by Grubel, Maki and Sax[7] in their study of the effects of the Unemployment Insurance System. It is a rough indicator of the generosity of the system.

The sign of the coefficients on the explanatory variables correspond to what one would expect *a priori*. The ratio of the real wage in Newfoundland to that in Ontario has a positive coefficient indicating that migration responds to relative financial rewards. The higher the Newfoundland wage relative to the Ontario wage, the higher would be the net in-migration or, equivalently, the lower would be net out-migration. In this equation net migration M is measured as 1,000's of workers. Thus, if the relative wage were to rise by 10% (say, from parity to 1.1) net out-migration would fall by between 1,300 and 2,000 per-

sons. This order of magnitude was consistently obtained in the other migration equations estimated but not reported here. This is a relatively significant influence considering that the mean value of net out-migration over the period 1951-76 was 3,149 persons.

The number of births lagged sixteen years was inserted as a demographic variable to capture the fact that migration rates are much higher for persons entering the labour force after the age of 16 than for other age groups. We also attempted to use the birth rate lagged sixteen years but with less success. The variable B_{-16} always appears as a strongly significant variable with a negative sign. Furthermore, the magnitude of the coefficient is astonishingly large. It suggests that for every 100 births, 80 net out-migrants occur 16 years later which is a very large proportion indeed. The 80 persons will, of course, include the induced migration of dependents in addition to the prime earner.

The unemployment rate in Ontario has the expected positive influence on net in-migration. A one percentage point rise in the Ontario unemployment rate reduces net out-migration by 1,366 persons. This is a rather large (and statistically significant) impact.

Finally, the benefit replacement ratio of the Unemployment Insurance system exerts a positive influence on net in-migration when it is included as an explanatory variable. The reason for this is somewhat less direct than with other variables. One can envisage at least two sorts of forces at work although there are undoubtedly many more. On the one hand, with a more attractive UI system the cost of remaining in a location which has a relatively high unemployment rate (i.e., Newfoundland) is reduced. If a worker expects to be periodically unemployed he will be less reluctant to migrate to a location at which unemployment is lower if UI benefits are attractive. The other reason has to do with the fact that the UI system favours some industries relative to others, especially those

which are seasonal (like fishing) or which have fluctuations in demand (like resource-based export industries). The UI system favours them in the sense that the expected contributions to the UI system from workers in those industries fall short of the expected benefits. In other words, the UI system is not run according to actuarial principles. This makes these industries relatively more attractive to workers than they would be in the absence of the UI system. To the extent that Newfoundland is relatively heavily endowed with industries of that sort, one would expect the sign on the $\frac{UIB}{W}$ variable to be positive. A rise in the ratio from, say, .3 to .4 would cause net out-migration to fall by about 1700 workers.

Note that the equation containing the UI benefit replacement ratio appears to fit better than the other equation. Its inclusion does, however, increase the standard error of the coefficient on the relative wage term enough to render it insignificant at the 95% level. (The t-statistic required for that would be 2.08 using a two-tailed test). It may be, however, that $\frac{UIB}{W}$ is related to the relative wage term since UI benefits are not set independently of wage rates. The existence of a cut-off limit to UI benefits implies that $\frac{UIB}{W}$ may systematically fall as W rises.

There are a number of other variables that one would expect would influence net migration. The most obvious of these is the Newfoundland unemployment rate itself. Previous studies have found unemployment in both sending and receiving regions to be significant determinants of migration.[8] Surprisingly, we had no success with the Newfoundland unemployment rate as an explanatory variable either by itself or as a difference or ratio formed with the Ontario unemployment rate. The reason for this may well be that the measured unemployment rate in Newfoundland does not give an accurate indication of the true unemployment rate.

For example, when the true unemployment rate is high many workers may simply be discouraged from entering the labour force; or, those laid off may simply leave the labour force.

Another variable which we experimented with was federal transfers to Newfoundland on a per capita basis. Some authors, especially Courchene[9] have argued that federal grants to low income provinces retard the ability of these provinces to improve their lot by interfering with normal adjustment mechanisms; that is, by reducing the outflow of persons from low-income regions. The grants allow provincial governments to provide services they otherwise could not provide or to provide services at lower tax rates. We used as a proxy for this effect total federal transfers to Newfoundland each year divided by population. A similar variable was found by Courchene to be significant in his cross-section study of interprovincial gross migration.[10] We could not obtain any explanatory power from this variable.

Finally, we used alternative measures of employment opportunities in the rest of Canada besides U_0. These included the level of unemployment, the level of employment, and changes in the level of employment. None of these alternative variables performed at all well. Only the unemployment rate results are reported here.

iii) Participation Rate

The other potential source of variability in the labour supply in response to wage rate changes is the labour force participation rate. The best fitting results for the estimation of the annual average labour force participation rate are as follows:

$$\pi = \underset{(31.38)^{**}}{.341} + \underset{(7.59)^{**}}{.20}\left(\frac{W}{CPI}\right) - \underset{(-3.43)^{**}}{.00467}\, B_{-16} \qquad (\pi\cdot 1)$$

$$\bar{R}^2 = .7983$$
$$SEE = .0117$$
$$D.W. = 1.76$$
$$F = 50.47^{**}$$

$$\pi = \underset{(1.42)}{0.1678} + \underset{(1.23)}{.0867}\left(\frac{W}{CPI}\right) - \underset{(-1.25)}{.00236}\, B_{-16} + \underset{(1.53)}{.3693}\, PC14 \qquad (\pi \cdot 2)$$

$$\bar{R}^2 = .7136$$
$$SEE = .0116$$
$$D.W. = 1.77$$
$$F = 20.10^{**}$$

These two equations give the participation rate as a linear function of the real wage in Newfoundland and demographic variables. In the first equation the real wage appears with the expected positive sign and is highly significant. The magnitude of the coefficient (.20) indicates that an increase in the real wage (in 1961 prices) of $10 would cause a rise in the participation rate of about two percentage points. The other variable in the first equation, births lagged 16 years, is significantly negative. This might seem to be somewhat surprising insofar as persons in the age group 17-24 might be expected to have a relatively high participation rate. Unfortunately, our data do not allow us to confirm this for Newfoundland. The negative sign may be accounted for in one of two ways. First, young persons tend to migrate much more readily as we found elsewhere in this study. Furthermore, those that migrate would be expected to be those with very high participation rates. Those that stay behind may, as a group, have much lower participation rates. Second, it may be the case that in an economy with already high unemployment rates, potential new entrants into the labour force are discouraged from entering owing to the low probability of obtain-

ing a job. The magnitude of the coefficient on B_{-16} indicates that a rise in births by 1,000 would be expected to reduce the participation rate by .2 percentage points. Thus, the magnitude of the effect is not large.

The other participation rate equation includes another demographic variable of the sort that is widely used in such equations, the proportion of the population fourteen years of age and over. This variable has the expected sign and appears to reduce the magnitude of the impact of all other variables. That is, all other coefficients are reduced by roughly one half. However, it's inclusion also renders all coefficients in the equation insignificant at the 95% level. The coefficient in PC14 indicates that we would expect a rise in the percentage of the population 14 and over by 10 percentage points to cause the labour force participation rate to rise by 3.7 percentage points. If this is true, PC14 explains a considerable part of the participation rate (along with the intercept term). However owing to the large standard errors we cannot place a great deal of reliance on this result. Furthermore, it is not likely that we can really consider the variable PC14 as being truly exogenous since it will be undoubtedly influenced by migration changes.

We did try a number of other variables in the participation rate equations with no success. For example, many studies have found unemployment rates to be a determinant of the participation rate.[11] Including the unemployment rate in our equations does not help at all. The magnitudes and standard errors of the coefficients on the other variables are virtually unchanged while that for unemployment is insignificant. Furthermore, the fit of the equation is worse in the sense that the standard error of the regression increases while the adjusted R^2 falls. Thus, we do not report those equations. We also attempted to use a variable for the generosity of the UI system (UIB). That, too, was unsuccessful.

iv) Labour Demand

The labour demand equation to be estimated is (16). Before reporting the best results, some empirical and methodological difficulties should be pointed out. First, in equation (16) the wage rate should be deflated by the output price. Since this is an aggregate model the relevant price should be some price index for industrial production. Unfortunately, we do not have such an index for Newfoundland. We do have a CPI for St. John's which we used. However, it is not satisfactory since it is based on a representative bundle of consumption rather than production. We also have a wholesale price index but it has the additional drawback that it is based upon 1939 quantities. The results reported below are for two cases: first, that in which simply the nominal wage and nominal outputs (value added) are used as independent variables; and, second, that in which wages and outputs are deflated by the CPI. Neither of these is completely satisfactory and slightly better results are obtained from the former.

The best fitting results for the aggregate labour demand equation were as follows:

$$\underset{}{\log N} = \underset{(.0029)}{.00389} - \underset{(-1.77)}{.245}\ \log W + \underset{(2.63)*}{.270}\ \log GPP + \underset{(4.19)**}{.623}\ \log N_{-1} \qquad (N\cdot 1)$$

$$\bar{R}^2 = .9549$$

$$SEE = .0443$$

$$\text{Durbin } h = -.7932$$

$$F = 170.57**$$

$$\log N = \underset{(.624)}{1.164} - \underset{(-.564)}{.116}\ \log \frac{W}{CPI} + \underset{(2.42)*}{.247}\ \log \frac{GPP}{CPI} + \underset{(3.62)**}{.566}\ \log N_{-1} \qquad (N\cdot 2)$$

$$\bar{R}^2 = .9564$$
$$\text{SEE} = .0436$$
$$\text{Durbin h} = -.2592$$
$$F = 176.346^{**}$$

In these equations GPP refers to Newfoundland Gross Provincial Product, a measure of the value-added in the economy. A few words are in order regarding the specification of these equations, especially the incorporation of the lagged dependent variable. When the regressions were run using only the wage and GPP variables as independent, the Durbin-Watson statistic indicated severe auto-correlation. The use of a lagged dependent variable turned out to be the best way of eliminating it. The Durbin h statistic is the appropriate test for serial correlation in the presence of a lagged dependent variable.[12] It is distributed as standard normal with zero mean and unit variance. The above values of h are well within the critical value at the 95% level of confidence.

The incorporation of the lagged dependent variable has the following interpretation. If we denote by L the one-period lag operator, then equation (N·1) can be rewritten in the following form, using the notation of (17):

$$\log N = \frac{\delta_0 + \delta_1 \log GPP + \delta_2 \log W}{1 - \delta_3 L}$$

where δ_3 is the coefficient on $\log N_{-1}$. This is well-known to be equivalent to a geometrically declining (Koyck) lag of the form:

$$\log N_t = \sum_{i=0}^{\infty} \delta_3^i (\delta_0 + \delta_1 \log GPP_{t-i} + \delta_2 \log W_{t-i})$$

It implies that the demand for labour is a lagged function of all past and current

values of GPP and W, with more recent values being given larger weights. The economic interpretation of this form of the demand for labour might be as follows. The behaviour of the firm might be dependent upon the expected values of its wage rate and output levels in the near future. The firm may form its expectations according to past values of wage rates and output levels. Thus, the firm's decision regarding the hiring of factors of production (both labour and capital) might be based upon what it expects the determining variables to be in the future. This interpretation requires that the firm cannot instantaneously adjust its inputs of labour and capital to currently prevailing prices and output. The original form of the demand for labour in equation (16) was derived under the assumption that the firm was under long run equilibrium. This will unlikely be the case since it takes time to change the capital stock. Thus, long run equilibrium is not attained for either capital or labour.

From the estimates in equation (N·1) or (N·2) we can obtain both the short-run elasticity in the demand for labour and the long run elasticity. The short-run elasticity in (N·1) is simply -.245 implying that a fall in the wage rate of 10% would cause a rise in the demand for labour of 2.45% in the same year. (The corresponding figure in (N·2) is 1.16%.) The long run elasticity of the demand for labour from a change in the wage rate holding GPP constant is the sum of the coefficients on logW in the current and all past periods. This will be given in (N·1) by:

$$\frac{\hat{\delta}_1}{1 - \hat{\delta}_3} = \frac{.245}{1 - .623} = .650$$

Thus, the long run elasticity of labour demand with respect to the wage rate holding output constant is considerably higher than the short run. For (N·2) it is .267.

We may also compute a standard error and a t-statistic for these long run elasticities.[13] The standard error on $\hat{\delta}_1/(1 - \hat{\delta}_3)$ is .4133 resulting in a t-statistic of -1.57 which is not quite significant at the 95% level.

The coefficient on the logW was earlier established to be $-1/(1 + \rho)$. This is also $-\sigma$ where σ is the elasticity of substitution of the production function since, as is well-known, $\sigma = 1/(1 + \rho)$. Our labour demand function implies that the estimate of the (long run) elasticity of substitution is 0.65 for the best fitting model. This degree of substitutibility is not unlike that found in other studies.

Also, since the coefficient on the variable log GPP was earlier shown to be $(1 + \rho/v)/(1 + \rho)$ we may calculate the estimated value of v. The estimated long run coefficient on log GPP is .270/(1 - .623) = .716. Since this is less than unity we can infer that $v > 1$; that is, that the production function exhibits increasing returns to scale. Indeed, the implied value of v is 5.01 which is unusually high. Using the same technique as above we can calculate the standard error for the long run coefficient on log GPP. It is found to be .487. This implies that the long run coefficient on logY is not significantly different from unity so we cannot actually reject constant returns to scale on statistical grounds.

d) Implications of the Aggregate Estimates

We may use the above estimates to obtain predictions of the effect of exogenous changes in migration on Newfoundland wage and unemployment rates taking into consideration all interdependencies in the system. Our task is simplified considerably by noticing that the determination of the wage rate changes in response to an exogenous shock in migration can be done independently and prior to

any consideration of changes in labour demand. Thus, we may proceed in two steps. The first is to investigate changes in W from exogenous shocks using the wage determination, participation rate, and migration equations. The second is to use this change in wage rate to investigate the change in the demand for labour and hence unemployment. We shall consider those two steps in turn.

i) The effect on W of exogenous shocks in M

Let us summarize the sort of dynamic system that has been estimated in the following manner:

$$W_{t+1} = a_0 + a_1 L_t + a_x X_t + \ldots$$

$$M_t = b_0 + b_t W_t + b_z Z_t \ldots$$

$$\pi_t = c_0 + c_t W_t + c_r R_t \ldots$$

where X_t, Z_t and R_t are exogenous variables. Notice that b_t and c_t are time dependent since they include CPI and/or W_0 as variables. It can be seen from this equation system that migration rates, participation rates, and wage rates are interdependent. Suppose, for example, that we have an exogenous one-period shock in migration in period t. This will cause the labour force to rise in period t and in each period thereafter. The wage rate will fall in t + 1 and will tend to be lower thereafter since the labour supply is higher. However, the fall in W_{t+1} will cause M_{t+1} and π_{t+1} to fall tending to reduce the labour supply in t+1. The wage rate in W_{t+2} will then rise to recoup part of the loss of the previous period. The system then recursively continues in this manner until the wage change dampens itself out (assuming the process to be stable). Presumably the final wage rate change approached in the long run will be negative but

less negative than the one-period change in the wage rate. The responsiveness of M and π to the wage rate will dampen the shock of the increase in L on W occurring in the short run.

This sequence of events can be depicted algebraically. For expositional purposes we look first at the case in which $c_t = 0$ so we merely concentrate on the interaction between migration and wage rates. Consider an exogenous increase in in-migration (or decrease of out-migration) in period one equal to db_0. Let it be once and for all. Then,

$$dM_1 = db_0$$

Since $dL_t = \pi_t dM_t$, we have from the wage determination equation,

$$dW_2 = a_1 \pi_1 db_0$$

Then, from the migration equation,

$$dM_2 = b_2 dW_2$$

Thus,

$$dW_3 = a_1 dL_2$$

$$= a_1 \pi_2 (dM_1 + dM_2)$$

$$= a_1 \pi_2 (db_0 + b_2 dW_2)$$

and, so on,

$$dM_3 = b_3 dW_3$$

$$dW_4 = a_1 dL_3$$

$$= a_1\pi_3(dM_1 + dM_2 + dM_3)$$

$$= a_1\pi_3(db_0 + b_2 dW_2 + b_3 dW_3)$$

$$\vdots \qquad\qquad \vdots$$

$$dM_t = b_t dW_t$$

$$dW_{t+1} = a_1\pi_{t+1}(db_0 + \sum_{i=2}^{t+1} b_i dW_i)$$

$$\vdots \qquad\qquad \vdots$$

In this manner, consecutive values of the change in W may be found for a once-and-for-all change in M.

As an example of a simulation of this sort using the estimated values of our model, let us consider the impact of a decrease in net out-migration (increase in M) of 1,000 persons. The results are, of course, symmetric for a decrease in M. The mean value of the labour force participation rate over the period is $\pi = .44$, although it has risen to .48 in recent years. Let us use $\pi_t = .44$, all t, for the purposes of this illustrative calculation. The variable b_t is the following:

$$b_t = \beta_1 \left(\frac{CPI_0}{CPI \cdot W_0} \right)$$

The ratio CPI_0/CPI is approximately unity while W_0 varies over time. The Ontario weekly wage rose over the latter half of our observations at the rate of about 7% per annum and stood at about $200 in 1975. For the purposes of exposition let us suppose we imagine our simulation starting in 1975 with $W_0 = 200$

and assume that it rises at the rate of 7% per year thereafter. The coefficient β_t is the coefficient of $\left(\frac{W}{CPI} \Big/ \frac{W_0}{CPI_0}\right)$ in the migration equations. We found that to be between 13 and 21 and for our illustrative computation we use $\beta_1 = 21$ to obtain an upper bound. Finally, the value of a_1 from the wage determination equation is between -.00011 and -.00035. To give an upper estimate of the impact on W_t we use the latter. Table IV-1 illustrates the stream of changes in M and W over ten years as a result of an initial change in net in-migration of 1,000 persons in the chosen base year. Since the relationships are all linear, a net out-migration of 1,000 persons would have symmetric effects but with opposite signs. As the table indicates the impact of this change in migration (which amounts to over one-third of average net out-migration over the period) on the wage rate is miniscule. The weekly wage would fall by only about $.14 in response to the addition of 1,000 new migrants. Running the simulation with the participation rate endogenous would make the effect even smaller.

The next step is to calculate the implications of the fall in the labour supply and the change in the wage rate for labour demand and unemployment in Newfoundland. The changes in labour demand induced by the changes in W are straightforward to calculate. To give an upper estimate we use the long run elasticity of the demand for labour with respect to the wage rate. From equation (N·1) that is -0.650. Period one is taken to be 1975. From the log-linear labour demand relationship it is the case that

$$\delta \log N / \delta \log W = -.650$$

or,

$$dN/N = -.650\ dW/W$$

Thus, $\Delta N \cong -.65\ \Delta W\ (N/W)$ with GPP constant.

TABLE IV - 1

$\pi = .44$

$a_1 = -.00035$

$a_1\pi = -.000154$

Period	$b_t(x10^3)$	ΔM	ΔW
1	.105	1,000	
2	.098	-15.09	-.154
3	.092	-13.95	-.152
4	.086	-12.86	-.149
5	.081	-11.95	-.148
6	.076	-11.07	-.146
7	.071	-10.22	-.144
8	.066	-9.40	-.142
9	.061	-8.60	-.141
10	.057	-7.96	-.140

This is the equation used to determine ΔN when W changes but GPP is fixed. It is, however, likely the case that changes in population induce changes in aggregate demand in Newfoundland. This will be true even for those who are not employed to the extent that they attract purchasing power from outside Newfoundland. For example, there are several sorts of federal transfers accruing to persons in Newfoundland which are influenced by population including equalization payments, certain conditional grants (Canada Assistance Plan, Established Programs Financing), Unemployment Insurance, Family Allowances, Old Age Security, and Canada Pension Plan payments. In addition, persons may tend to spend part of their capital income in the province in which they reside. Finally, labour income paid to those persons who are hired as a result of migration will add to aggregate demand in Newfoundland.

It would require an extremely complex aggregate model to attempt to determine the exact relationship between population and aggregate demand in Newfoundland, and we are in no position to undertake such a task. What we have done instead are simulations of the effect of migration under a variety of assumptions about the relationship between population and aggregate demand. It is assumed that a one percent rise in population (P) gives rise to a λ percent rise in GPP where λ is allowed to take on values 0, .5, and 1.0. The upper bound of 1.0 was chosen to conform with the results found by Davies (1977).[14] His simulations with various Canadian econometric macro-models showed that total Gross National Expenditures for Canada also rose with immigration but in less than proportion. Thus, per capita GNE is reduced. Since we are dealing with a province whose economy is much more open than the entire Canadian economy we would certainly not expect λ to be as high as that for all of Canada.

The simulations with GPP endogenous were done as follows. In the estimation of the labour demand equation we found the long-run elasticity of demand for labour with respect to GPP to be .716. This implies that

$$\delta \log N/\delta \log GPP = .716$$

or

$$dN/N = .716\ d(GPP)/GPP$$

Therefore,

$$\Delta N \cong .716\ N\Delta(GPP)/GPP \text{ with W constant.}$$

When we take into account both the change in W previously determined and the change in GPP the overall change in labour demand is given by:

$$\Delta N \cong .716\ N\Delta(GPP)/GPP - .65\ \Delta W(N/W) \qquad (22)$$

In calculating ΔN for various years the values of ΔW are those given in Table IV.1. The Newfoundland wage rate W was \$193 in 1975 and is assumed to rise at 7% per year thereafter. Newfoundland employment N was 152,000 in 1975 and is assumed to rise at 4% per year. The proportionate change in GPP, $\Delta GPP/GPP$, is λ times the proportionate change in population, $\Delta P/P$. ΔP is determined from the induced migration figures in Table IV.1 while P was 550,100 in 1975 and is assumed to rise at 1% per year which is the average rate in recent years.

Table IV.2 shows the values for ΔN, ΔU and $\Delta U/\Delta L$ resulting from an initial reduction in net out-migration of 1,000 persons when λ is 0, .5 and 1.0. The latter variable is the proportion of the induced change in the workforce unemployed. The simulations are given for 10 years. The variables and parameters were chosen to give upper estimates for the change in unemployment ΔN.

The general picture to emerge from the results of Table IV·2 is that the stream of additional employment generated by migration is small relative to the

TABLE IV-2

Changes in Employment and Unemployment induced by an initial change of net in-migration of 1,000 (π = .4)

Year	ΔP	λ=0			λ=.5			λ=1.0		
		ΔN	ΔU	$\frac{\Delta U}{\Delta L}$	ΔN	ΔU	$\frac{\Delta U}{\Delta L}$	ΔN	ΔU	$\frac{\Delta U}{\Delta L}$
1	1,000	0	440	1.0	99	341	.78	198	242	.55
2	985	77	356	.82	177	256	.59	277	156	.36
3	971	74	353	.83	176	251	.59	277	150	.35
4	958	70	352	.83	174	248	.59	277	145	.34
5	946	68	348	.84	174	242	.58	279	137	.33
6	935	65	346	.84	172	239	.58	279	132	.32
7	925	62	345	.85	171	236	.58	280	127	.31
8	915	60	343	.85	171	232	.58	282	121	.30
9	907	57	342	.86	171	228	.57	284	115	.29
10	899	55	341	.86	171	225	.57	286	110	.28

increase in the supply of labour. Even when the value of λ is unity, about 30% of the additional labour supply is unemployed. When λ is .5, close to 60% of the additional labour supply is unemployed. The converse of this is that an increase in out-migration would tend to reduce unemployment substantially without affecting the wage rate much. Thus, migration tends to have its prime influence on unemployment levels rather than on wage rates owing in large part to the rigidity of the latter. In addition, of course, some of the migrants will be non-participants in the labour market. In-migrants of this sort will increase aggregate demand since they bring in some purchasing power from outside the province. However, such additional demand is apparently not enough to induce enough extra production to employ the extra workers entering.

There are a variety of other sorts of simulation exercises one might perform. For example, suppose that there was an exogenous shift in W_0. Since W is closely related to W_0 the relative wage would remain close to what it was before and migration would not be induced to change. The change in the Newfoundland wage would however influence both the participation rate and the level of employment demand. Suppose that the Ontario wage rose by 10% and this induced a 10% rise in the Newfoundland wage. Unemployment would rise in Newfoundland on two accounts. First, the participation rate would rise (assuming that the rise in the wage was not accompanied by a rise in the CPI). A 10% rise in the nominal wage would cause a rise of about 2 percentage points in the participation rate (or upwards of 4,000 workers). Similarly, it would cause a fall in the demand for labour of about 6 per cent in the long run (or approximately 9,000 workers). This is a very significant effect indeed and one which migration would do nothing to offset.

Another exercise might be to consider an exogenous shock in the Newfoundland wage rate. An exogenous rise in W by, say, 10% would cause an increase in net in-migration in the order of 1,500 persons. This would then induce a

change in W, employment and unemployment not unlike that shown in the previous table. In words, the induced migration (reduction in out-migration) would result almost entirely in a rise in unemployment with very little influence on the wage rate.

e) Estimation of the Disaggregated Model

The estimation of the system of equations (21) follows closely that obtained for the aggregate system. The only difference is that a wage equation was estimated for each of the sectors separately and a weighted average of the wages was used as a determining variable in the migration and participation rate equations. Once again since the lagged labour supply was used in the wage determination equations, ordinary least squares estimates are sufficient. The "best" estimates are presented below.

i) Wage Rate Determination

The sectors involved were Mining, Forestry, Manufacturing, Construction, Services, and Fishing. The respective wage equations determined for each were as follows.

Mining

$$W = \underset{(-1.61)}{-78.08} + \underset{(2.13)*}{.841\ W_0} + \underset{(2.30)*}{1.147\ CPI} - \underset{(-.386)}{.000151\ L_{-1}} + \underset{(.807)}{.000507\ \theta}$$

$$\bar{R}^2 = .9803$$
$$SEE = 10.55$$
$$D.W. = 2.01$$
$$F = 299.84**$$

Forestry

$$W = \underset{(-1.02)}{-44.05} + \underset{(2.12)*}{.957\ W_0} + \underset{(3.36)**}{1.623\ CPI} - \underset{(-2.64)*}{.00104\ L_{-1}} - \underset{(-.247)}{.000395\ \theta}$$

$\bar{R}^2$ = .9676
SEE = 11.04
D.W. = 1.08
F = 180.144**

Manufacturing

$$W = \underset{(-1.83)}{-27.86} + \underset{(3.12)**}{.447\ W_0} + \underset{(6.58)**}{1.131\ CPI} - \underset{(3.57)**}{.000476\ L_{-1}} + \underset{(1.41)}{.000849\ \theta}$$

$\bar{R}^2$ = .9921
SEE = 3.81
D.W. = 1.71
F = 756.454**

Construction

$$W = \underset{(.778)}{39.08} + \underset{(2.95)**}{1.867\ W_0} - \underset{(-.703)}{.408\ CPI} - \underset{(-1.31)}{.000562\ L_{-1}} - \underset{(-.216)}{.000125\ \theta}$$

$\bar{R}^2$ = .9719
SEE = 10.34
D.W. = 1.87
F = 208.145**

Services

$$W = \underset{(-4.80)**}{-38.93} + \underset{(5.33)**}{.389\ W_0} + \underset{(5.22)**}{.466\ CPI} + \underset{(1.68)}{.000123\ L_{-1}} - \underset{(-.35)}{.274\ \theta}$$

$\bar{R}^2$ = .9968
SEE = 1.94
D.W. = 1.08
F = 1866.31**

Fishing

$$W = \underset{(-8.14)}{-80.15} - \underset{(-.501)}{.075\ W_0} + \underset{(10.58)}{1.202\ CPI} + \underset{(.547)}{.000052\ L_{-1}} + \underset{(.543)}{.00181\ \theta}$$

$$\bar{R}^2 = .9954$$
$$SEE = 2.25$$
$$D.W. = 2.08$$
$$F = 1028.61^{**}$$

These results are not unlike those obtained in the aggregate model. In most cases the Ontario wage rate and the Newfoundland CPI are positive, significantly different from zero and not significantly different from unity. The aggregate labour supply lagged is negative in four cases and significantly so in only two. In the remaining two cases, it is insignificant but positive. The order of magnitude of the estimated coefficients is similar to that found for the aggregate model indicating that changes in labour supply tend to have but a weak effect on wage rates the following period. Thus, changes in migration might be expected to have very little influence on wage rates.

Oddly enough, the productivity variable never appears to be significant. This may partly reflect the fact that the measure of productivity, output per man, is a crude representation of technical change. It may also reflect the extent to which the Newfoundland wage is institutionally fixed to the Ontario wage and the CPI.

ii) Net Migration

The net migration equation is the same as before except that the wage rate used as the independent variable is the weighted average of the individual sector wages. The best equations here are similar to the best equations determined in the aggregate version. They are

$$M = \underset{(.665)}{1.362} - \underset{(-.78)}{3.69}\left(\frac{W}{CPI}\Big/\frac{W_0}{CPI_0}\right) - \underset{(-2.25)*}{.555\ B_{-16}} + \underset{(2.69)*}{1.25\ U_0}$$

$$\bar{R}^2 = .4228$$
$$SEE = 1.95$$
$$D.W. = 1.59$$
$$F = 7.104**$$

$$M = \underset{(-1.45)}{-3.68} - \underset{(-.565)}{2.35}\left(\frac{W}{CPI}\Big/\frac{W_0}{CPI_0}\right) - \underset{(-2.84)}{.615\ B_{-16}} + \underset{(1.82)}{.79\ U_0} + \underset{(2.81)*}{20.52\ \frac{U1B}{W}}$$

$$\bar{R}^2 = .5608$$
$$SEE = 1.70$$
$$D.W. = 1.96$$
$$F = 8.98**$$

In these equations the coefficients on the lagged birth rate, the unemployment rate and the unemployment insurance variable are of the same sign, magnitude and significance as those obtained earlier in the aggregate model. However, now the coefficient on the relative wage term is no longer significant and in any case of the incorrect sign (and of small magnitude). Thus, the weighted average wage rate does not appear to have anywhere near the explanatory power as the aggregate series of average weekly wages utilized in the previous empirical model. As well the summary statistics indicate that the fit in the above equations is not as good as in the aggregate model.

ii) Participation Rate

The equations determining π are again similar to those obtained in the aggregate model. The best fitting equations are as follows (where W is now the weighted average wage):

$$\pi = \underset{(32.88)^{**}}{.398} + \underset{(3.02)^{**}}{0.216}\left(\frac{W}{CPI}\right) - \underset{(-1.86)}{.00767}\, B_{-16}$$

$$\bar{R}^2 = .4943$$
$$SEE = .01857$$
$$D.W. = .97$$
$$F = 13.2181^{**}$$

$$\pi = \underset{(.025)}{.0019} - \underset{(-.066)}{.00388}\left(\frac{W}{CPI}\right) - \underset{(-.247)}{.000723}\, B_{-16} + \underset{(5.37)^{**}}{.699}\, PCPOP14 + \underset{(1.32)}{.000718}\, U$$

$$\bar{R}^2 = .7036$$
$$SEE = .0118$$
$$D.W. = 1.92$$
$$F = 14.65^{**}$$

These equations are very similar to those obtained in the aggregate model. The coefficient on the real wage in the first equation is significantly positive and virtually of the same magnitude as in the earlier use. Once again when the proportion of the population 14 years and over is included it becomes the prime explanatory variable, rendering all others insignificant. The discussion of the preceding model applies here completely.

iv) Labour Demand

A conditional labour demand equation in log-linear form was estimated for each of the industries separately. The best results are reported below along with the estimated value for the elasticity of substitution (which is the long run coefficient on logW) and the long run output elasticity whose magnitude indicates returns to scale. We denote this variable α. If $\alpha > 1$, $v < 1$ and vice versa. Also, output Y is measured as real value-added for the industry con-

cerned; that is, value-added deflated by the price index.

Mining

$$\underset{}{\log N} = \underset{(1.94)}{2.57} - \underset{(-.75)}{.117}\ \log\left(W/p\right) + \underset{(2.41)*}{.166}\ \log Y + \underset{(2.43)*}{.438}\ \log N_{-1}$$

$\bar{R}^2 = .6452$

$\sigma = .21$ SEE = .103

$\alpha = .30$ D.W. = 1.81

F = 15.55**

Fishing

$$\underset{}{\log N} = \underset{(2.85)*}{2.52} - \underset{(2.36)*}{.190}\ \log\left(W/p\right) - \underset{(-3.51)**}{.124}\ \log Y + \underset{(11.6)**}{.89}\ \log N_{-1}$$

$\bar{R}^2 = .8723$

$\sigma = 1.73$ SEE = .0477

$\alpha = -1.13$ D.W. = 1.96

F = 55.64**

Forestry

$$\underset{}{\log N} = \underset{(-2.71)}{-6.55} + \underset{(.534)}{.0909}\ \log\left(W/p\right) + \underset{(3.43)**}{.668}\ \log Y + .796\ \log N_{-1}$$

$\bar{R}^2 = .8448$

$\sigma = 0$ SEE = .161

$\alpha = 3.27$ D.W. = 2.20

F = 44.54**

Manufacturing

$$\underset{}{\log N} = \underset{(.98)}{1.26} + \underset{(.627)}{.0749}\ \log\left(W/p\right) + \underset{(2.64)*}{.183}\ \log Y + \underset{(4.41)**}{.599}\ \log N_{-1}$$

$\bar{R}^2 = .933$

$\sigma = 0$ SEE = .0397

$\alpha = .46$ D.W. = 1.62

F = 112.489**

Construction

$$\log N = \underset{(1.24)}{3.74} - \underset{(-.33)}{.158} \log\left(W/p\right) + \underset{(.865)}{.170} \log Y + \underset{(1.94)}{.318} \log N_{-1}$$

$\bar{R}^2 = .2147$

SEE = .234

D.W. = .84

F = 3.19

Services

$$\log N = \underset{(1.60)}{5.91} + \underset{(1.42)}{1.06} \log\left(W/p\right) + \underset{(.99)}{.202} \log Y + \underset{(1.26)}{.209} \log N_{-1}$$

$\bar{R}^2 = .9386$

SEE = .082

D.W. = 1.62

F = 123.334**

These results are somewhat disappointing. The equations for Construction and Services are not satisfactory at all. Neither output nor relative price variables are significant and in the case of Services the wage variable even appears to have the incorrect sign. In Mining, Forestry and Manufacturing the output variable is significantly positive with $v > 1$ for Mining and Manufacturing (increasing returns to scale) but < 1 for Forestry (decreasing returns). In none of these cases is the relative wage variable significant or even large. This would be consistent with the elasticity of substitution being very low.

Fishing shows a negative and significant coefficient on the relative wage but output has the wrong sign. All in all, the neo-classical conditional labour demand functions do not have much explanatory power in the disaggregated form. This may be for several reasons not the least of which is the possibility that the data base is insufficiently accurate.

v) Implications of the Disaggregated Model

The equations fitted for the disaggregated version of the model were not unlike those obtained for the aggregate version. The wage determination, migration and participation rate equation tell virtually the same story as before. The wage rate is primarily determined by the level of wages in Ontario and the CPI with labour supply and productivity variables having relatively minor influences. At the same time the labour supply response to wage rate changes is relatively strong through both the migration and the participation rate equations. Thus, exogenous changes in migration will have but a small influence on wage rates in Newfoundland while changes in the Newfoundland wage will have relatively large impacts on labour supply.

Unfortunately, the labour demand equations were rather disappointing in terms of fit. We had hoped to be able to determine to which sectors increases in the labour supply would be attracted. The results instead tended to show little response of labour demand to changes in industry wage rates. Since wage responses to labour supply shocks are very small as well, it appears as if migration shocks show up primarily in similar changes in Newfoundland unemployment. Out-migration would induce a reduction in unemployment with very little effect on the wage rate which in-migration would correspondingly increase unemployment. The Newfoundland wage rate appears to be largely determined by other factors than the labour supply.

3. Conclusions

The purpose of the labour market model estimated here was to come to some view as to the manner in which the Newfoundland labour market adjusted to changes in migration taking full account of the possibility that migration itself is influenced by labour market conditions. As discussed at the outset there are two views of the adjustment process. The neoclassical approach assumes that wages are flexible and thus any increase in the labour force will be accommodated by a fall in the wage rate to the level consistent with full employment. Or, an increase in out-migration will cause the wage to rise and migration will tend to equilibrate wages. Alternatively, wages might be inflexible and increases in the labour supply will be observed as higher unemployment.

In the empirical work reported above we have settled upon a hybrid model incorporating elements of the neo-classical and the fixed wage version. Put simply, the wage rate is not a market-clearing device but at the same time is allowed to be influenced by market conditions. The model was estimated using annual data on the Newfoundland economy for the period 1951-78. An aggregate version was estimated along with a version in which the output of various sectors is distinguished.

The message of the empirical estimates is as follows. The wage rate in Newfoundland is strongly related to the wage rate in Ontario and the relative CPI but only weakly related to the aggregate labour supply and productivity. On the other hand both the labour supply and the labour demand are dependent upon the wage rate in the expected manner. In particular, migration appears to respond to real wage differences between Newfoundland and Ontario as well as to the Ontario unemployment rate and certain demographic variables.

Overall, the empirical model lends heavy support to the fixed wage model. An exogenous change in migration has very little change in the Newfoundland wage rate but is almost entirely reflected in changes in the amount of unemployment. An exogenous rise in the Ontario real wage, causes a corresponding rise in the Newfoundland real wage. No migration is induced and Newfoundland suffers an increase in unemployment. An exogenous rise in the Newfoundland wage both increases the labour supply through induced migration and higher participation rates and lowers the demand for labour. Thus, unemployment rises. It would seem that a policy of encouraging migration would reduce unemployment without affecting the wage rate significantly.

These results are based on an empirical model in which several simplifications are made so that they must be taken with a grain of salt. The labour supply data are aggregate and thus cannot differentiate among persons of different age or education. As our discussion in earlier parts of this report indicate, migrants tend to differ considerably as regards to both of these variables. Similarly, industry outputs and selling prices are highly aggregated. Finally, by concentrating solely upon the labour market we abstract from changes in the equilibrium quantities of capital and outputs (or aggregate demand). Data and time limitations were such that we could not consider these broader questions.

Data Appendix

The data set used to test these models was developed from individual industry and province-wide estimates of the key variables. A major assistance in this compliation was the *Newfoundland Historical Statistics* publication plus annual *Supplements*. These publications contain most of the data series on prices, value added, labour force and wage rates. Deriving consistent estimates for each series was the most difficult part of the process, since some of the series went through a change in coverage and definition between the early and later years. However for practically all cases annual estimates were obtained for the period 1951 to 1978.

There were two series, however, which offered special problems. One was the estimates for value added in the service industry. The latter was obtained as a residual; i.e., from gross domestic or gross provincial product, the sum of value added in the commodity sector (including construction) was subtracted. Since GPP and GDP are conceptually different, and given that the former was available only from 1951 to 1967 while the latter covered only the years 1960 to 1967 a consistently defined estimate of value added in the service sector was impossible to calculate directly. However since the two series overlapped for the years 1960 to 1967 it was possible to find the relationship between value added in the Service Sector obtained using gross provincial product and that when gross domestic product (the conceptually more accurate total) was used. The following relationship was obtained:

$$\underset{}{\text{VASER1}} = a + \underset{(14.66)}{0.881}\ \text{VASER2}$$

$$\bar{R}^2 = 0.97.$$

Thus it was possible to adjust VASERV1 to bring it in conformity with VASER2.

The other major problem was in obtaining a consistent series of migration to and from Newfoundland. In the absence of direct estimates of in- and out-migration, a residual approach had to be used. The population identity required to calculate net migration is

$$NM = P_1 - P_0 - NI$$

where

NM = net migration
P_1 = final population
P_0 = initial population
NI = natural increase.

Since P_1, P_0 and NI are available on an annual basis over the period, yearly estimates for NM were calculated. However, beginning in 1961 (see section I of this Interim Report), Statistics Canada calculated gross in- and out-migration by province, on an annual basis using family allowance data. This latter series seems superior to the former and it provides, as well, direct estimates of in and out movements. For the tests shown here the residual method figures were used. However in the section on patterns of migration the latter was used extensively. The following table summarizes the time series collected for use in the labour adjustment model.

DATA SET

NEWFOUNDLAND MIGRATION STUDY

1951-1978

SYMBOL	TRANSLATION
NTPOP	Nfld. Total Population
NATINC	Nfld. Natural Increase (calendar year)
NETMIGA	Net Migration calculated using $P_1 - P_0 - NI^v$ when births and deaths calculated on basis of calendar year
NETMIGB	Net Migration calculated using $P_1 - P_0 - NI$ when births and deaths calculated on basis of fiscal year for 1957-76 and on basis of calendar year for 1951-56.
NETMIGC	Net Migration calculated using $P_1 - P_0 - NI$ when births and deaths calculated on basis of fiscal year
NETMIGD	Net Migration calculated by Stats. Can. in Cat. No. 91-208 p. 107 for 1962-76 and $P_1 - P_0 - NI$ for 1951-61.
PRIEM	Primary (Fishing & Mining & Forestry) Employment
NHAT	per cent change in total employment where total employment (TEMP) is the sum of employment in all sectors
NXHAT	per cent change in primary employment
MHAT	per cent change in migration using series D(NETMIGD)
NLABFOR_L	Nfld. Labour Force in units of workers
NEMPL	Nfld. Total Employment = TEMP
NUNEMPL	Nfld. Total Unemployment
NUNRATE	Nfld. Unemployment rate
NMALEL	Nfld. Male Labour Force
NMLFPR	Nfld. Male Labour Force Participation Rate
FEMLAB	Nfld. Female Labour Force
FEMLAB	Nfld. Female Labour Force Participation Rate
NIFPR	Nfld. Labour Force Participation Rate for both sexes
MPOP14	Male Population Age 14 and over
FEMPOP14	Female Population Age 14 and over
TOTPOP14	Population Age 14 and over

Page 2 DATA (continued)

SYMBOL	TRANSLATION
OLAB	Ontario Labour Force
OEMPL	Ontario Total Employment in thousands
OUNEMP	Ontario Total Unemployment
OUNRATE= U_0	Ontario Unemployment Rate in units of percent
OLFPR	Labour Force Participation Rate in Ontario (both sexes)
VAFISH	Value Added Fisheries (millions of nominal $)
VAFORE	Value Added Forestry
VAELEC	Value Added Electric Power
VAMINE	Value Added Mining
VAMANU	Value Added Manufacturing ($millions)
VACONS	Value Added Construction
VACOMS	Value Added in all commodities
VASERV1	G.D.P. minus (VAFISH + VAFORE + VALEC + VAMANU + VANCONS)
VASERV2	G.P.P. minus VACOMS ($millions)
G.D.P.	Nfld. G.D.P.
NGPP	Nfld. G.P.P.
FISHEMP	Total employment in fisheries
MINEEMP	Total employment in mining
FOREMP	Total employment in forestry
EPOWEMP	Total employment in electric power
MANEMP	Total employment in manufacturing
CONEMP	Total employment in construction
SEREMP	Total employment in service sector
NNEWK	Nfld. New Capital Investment ($millions)
NREP	Nfld. Repair and Maintenance Expenditure
NTOTI	Nfld. Total Investment
ONEWK	Ontario New Capital Investment ($millions)
OREP	Ontario Repair and Maintenance Expenditure
OTOTI	Ontario Total Investment

SYMBOL	TRANSLATION
STJCPI	CPI for St. John (1961 = 100)
TORCPI	CPI for Toronto (1961 = 100)
NEARN =W	Avg. weekly earnings (industrial composite) for Nfld. in dollars
ONTEARN	Avg. weekly earnings (industrial composite) for Ontario
FISHIND	Selling Price Index for fishing sector
MININD	Selling Price Index for mining sector
FOREIND	Selling Price Index for forestry sector
ELINDI	Selling Price Index for electric power sector
MANIND	Selling Price Index for manufacturing sector
CONIND	Selling Price Index for construction sector
SERVIND	Selling Price Index for service sector
WPI	Wholesale Price Index, 1935-39 = 100
PRIEM	Total employment - primary sector (mining, fishing, forestry)
EPOWEMP	Total employment in electric power
SECDEMPT	Total employment in secondary sector (manufacturing, construction)
SEREMP	Total employment in service sector
NEMPL	Total employment in Newfoundland
----------PRIME + EPOWEMP + SECDEMP + SEREMP ≠ NEMPL due to "15 and over constraint"----------	
FISHAVWG	Average wage - Fishing ($ per week)
MINAVWG	Average wage - mining
FORAVWG	Average wage - forestry
MANAVWG	Average wage - manufacturing
CONAVWG	Average wage - construction
SERAVWG	Average wage - service
NEARN	Average weekly earnings
OM	Gross Out-Migration
IM	Gross In-Migration
MIGDHAT	per cent change in net migration (series D) from previous year (a negative sign denotes a rise in net out-migration and a positive sign denotes a decline in net out-migration.

DATA (continued)

SYMBOL	TRANSLATION
WDIFF	Average weekly wage in Newfoundland divided by average weekly wage in Ontario, quotient expressed in decimals
BIRTH16 $= B_{-16}$	Number of births in Newfoundland sixteen years ago, measured in thousands
UDIFF	Newfoundland unemployment rate divided by Ontario unemployment rate, quotient expressed in decimals
TRANPOP	Total federal transfers to Newfoundland in thousands of dollars per capita
UCBAWW $=$UIB/W	Average weekly unemployment insurance benefits per claim divided by average weekly earnings
M	Net in-migration in thousands of workers
π	Newfoundland labour force participation rate in Units of percent
CPI	Consumer Price Index
PC14	Percent of population 14 years and over

DATA SET SOURCES

1) Newfoundland: *Historical Statistics of Newfoundland and Labrador*, Department of Supply and Services Government of Newfoundland and Labrador, St. John's, Newfoundland.

2) Ontario: *Ontario Statistical Review*, Annual Economic Analysis Branch, Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.

FOOTNOTES

1. For a survey of these empirical models see Michael J. Greenwood, "Research on Internal Migration in the United States: A Survey", *Journal of Economic Literature*, Vol. 13, June 1975, 397-433.

2. See, for example, T.J. Courchene, "Interprovincial Migration and Economic Adjustment", *Canadian Journal of Economics*, Vol. 1, June 1968, 211-23; J. Vanderkamp, "Interregional Mobility in Canada: A Study of the Time Pattern of Migration", *Canadian Journal of Economics*, Vol. 1, August 1968, 595-608; E. Kenneth Grant and John Vanderkamp, *The Economic Causes and Effects of Migration: Canada, 1965-71*, Economic Council of Canada, Ottawa, 1976; and other references cited in the latter.

3. Courchene, "Interprovincial Migration and Economic Adjustment", op. cit.

4. For example, Lawrence H. Officer and Peter R. Andersen, "Labour-Force Participation in Canada", *Canadian Journal of Economics*, Vol. 2, May 1969, 278-87; Herbert G. Grubel, Dennis Maki, and Shelly Sax, "Real and Insurance-Induced Unemployment in Canada", *Canadian Journal of Economics*, Vol. 8, May 1975, 174-91.

5. This variable is widely used as an explanatory variable in explaining the influence of the unemployment insurance system on unemployment and layoffs. See, for example, Grubel, Maki, and Sax, "Real and Insurance-Induced Unemployment in Canada", op. cit.; C. Green and J.-M. Cousineau, *Unemployment in Canada: The Impact of Unemployment Insurance*, Economic Council of Canada, Ottawa, 1976; M.S. Feldstein, "The Effect of Unemployment Insurance on Temporary Layoff Unemployment", *American Economic Review*, Vol. 68, December 1978, 834-46.

6. Note that in (14) we have left out the efficiency parameter by normalizing the measure of Y so that the efficiency parameter is unity. This makes no difference to the functional form finally estimated. For a critical survey of the literature on estimating factor demand equations see Frank Brechling, *Investment and Employment Decisions*, Manchester University Press, 1975.

7. Grubel, Maki, and Sax, "Real and Insurance-Induced Unemployment in Canada", op. cit.

8. See, for example, Courchene, "Interprovincial Migration and Economic Adjustment", op. cit.

9. T.J. Courchene, "Avenues of Adjustment: The Transfer System and Regional Disparities" in M. Walker (ed.), *Canadian Confederation at the Crossroads*, Fraser Institute, Vancouver, 1978, Chapter 4.

10. Courchene, "Interprovincial Migration and Economic Adjustment", op. cit.

11. Lawrence H. Officer and Peter R. Andersen, "Labour-Force Participation in Canada", *Canadian Journal of Economics*, II, No. 2 (May 1969), 278-87.

12. The Durbin h statistic is calculated as:

$$h = (1 - \tfrac{1}{2}d) \sqrt{T/(1 - T \cdot \text{Var } \hat{\beta})}$$

where d is the Durbin-Watson statistic, T is the sample size, and Var $\hat{\beta}$ is the estimated variance of the coefficient on the lagged dependent variable.

13. The formula for doing so is as follows.

$$\text{Var}\left(\frac{\hat{\delta}_1}{1 - \hat{\delta}_3}\right) = \left[\frac{1}{1 - \hat{\delta}_3} - \frac{\hat{\delta}_1}{(1 - \hat{\delta}_3)^2}\right] \left[\text{Cov } \hat{\delta}_1 \hat{\delta}_3\right] \begin{bmatrix} \dfrac{1}{1 - \hat{\delta}_3} \\ \\ -\dfrac{\hat{\delta}_1}{(1 - \hat{\delta}_3)^2} \end{bmatrix}$$

The standard error is then $\sqrt{\text{Var } (\hat{\delta}_1/(1 - \hat{\delta}_3)}$ and the t-statistic is computed in the usual way.

14. Gordon W. Davies, "Macroeconomic Effects of Immigration: Evidence from CANDIDE, TRACE, and RDX2", *Canadian Public Policy*, III:3 Summer 1977, 299-306.

CHAPTER V

Conclusions

In this study we set out to examine the implications of migration for the Newfoundland economy. The evidence on which it is basedhas been drawn from two sources. First, annual aggregate data covering the period 1951 to 1978, which formed the statistical base for an examination of the relation between net migration, earnings and unemployment. Second, cross-section data from the 1971 and 1976 Census' were obtained from Statistics Canada in the form of special cross tabulations by age, income, years of schooling, labour force and migration status and by two classifications of place of birth. The latter were used to study the characteristics of migrants and the income payoffs accruing to migration.

Our aim in this study was to seek some reconciliation, through the evidence listed above, between two conflicting hypotheses regarding the implications of migration on the resident population. The first of these conceives migration as contributing to the reduction in income and unemployment disparities among regions. The second views migration as exacerbating the problem of disparities. In the first case migration is an adjustment mechanism relieving pressures of excess supply of labour in the depressed region while the second views migration as drawing off the young and highly skilled leaving the resident population with factor imbalances and greater tax burdens. An extension of the latter might be that, coupled with this selective out-migration, has gone a return migration dominated by the older, the less skilled and those who have been less successful.

The main finding of our study is that the evidence examined for it suggests that migration has not been detrimental to the economy of Newfoundland. This conclusion is based on two main observations. First, out-migrants born in the province tend to be young; have skills not much different from their peers; and earn significantly higher incomes in the rest of Canada. However, it is also true that Newfoundland born migrants returning to the province are slightly older than out-migrants but younger than the non-migrants have higher incomes than the latter and they tend to be relatively better educated than those leaving the province. This exchange would appear to provide a positive benefit to the economy of Newfoundland since it suggests that those born in the province who chose to leave do so when they are young and relatively unskilled, returning home 10 years or so later with improved skills. The concept that only those who have failed return to the province seems dispelled by the evidence revealed in the 1971 Census data.

For migrants not born in the province the patterns of migration are substantially different but not the conclusion on the consequences of this movement. In the case of in-migrants born elsewhere they tend to be slightly younger than the average age for the province; enjoy much higher ratios of employment; and earn substantially higher incomes, even when adjustment is made for years of schooling, than do residents of the province. The out-migrants of this sub-group tend to have many of the same characteristics as in-migrants born elsewhere. This net exchange of human capital would seem to be in Newfoundland's favour.

When, then, observations for both groups of migrants are combined, it appears that far from being detrimental, migration is a contributing factor to the development of the province. Indeed the best course of action would seem to be one which permitted an unhindered flow of population to and from Newfoundland.