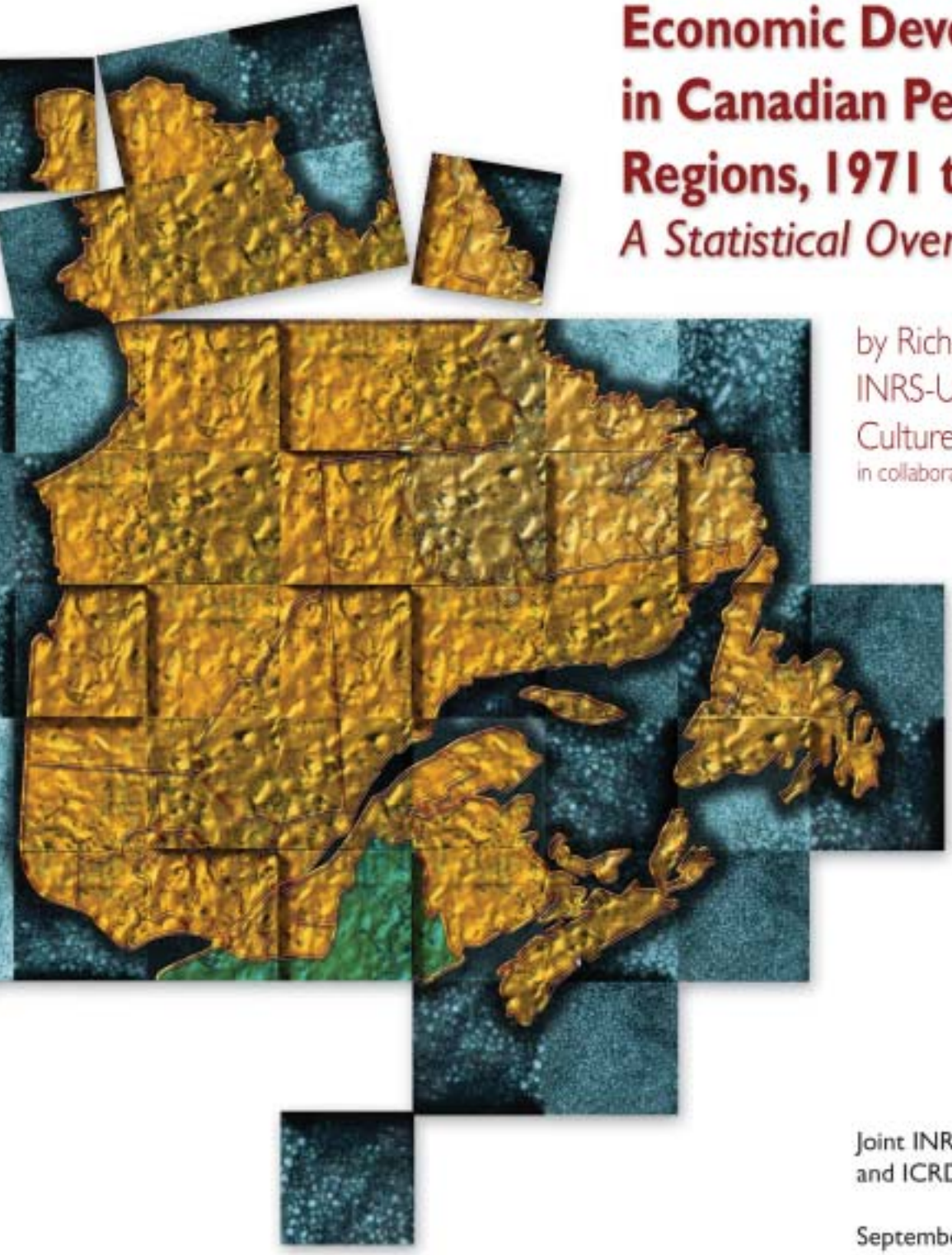
Regions in the Knowledge Economy



Economic Development in Canadian Peripheral Regions, 1971 to 1996

A Statistical Overview

by Richard Shearmur
INRS-Urbanisation, Culture et Société
in collaboration with Mario Polèse, INRS-UCS

Joint INRS (Montreal) and ICRDR (Moncton) project

September 2001

Université du Québec
Institut national de la recherche scientifique
Urbanisation, Culture et Société

INSTITUT CANADIEN DE RECHERCHE SUR LE DÉVELOPPEMENT RÉGIONAL
THE CANADIAN INSTITUTE FOR RESEARCH ON REGIONAL DEVELOPMENT

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Contents

Executive summary

This report presents a statistical analysis of the Canadian space economy based upon a geographic subdivision of the territory into 382 distinct units, and data for 142 distinct economic sectors and a variety of socio-economic indicators. The period of study is 1971 to 1996, and the data are derived from Statistics Canada censuses. The following principal conclusions emerge:

1- Long term trend towards the metropolisation of economic activity

There is a systematic tendency for employment to concentrate in and around large metropolitan areas. The only peripheral areas which are showing reasonable levels of growth are some of the larger urban areas which are themselves regional centres. Especially over the 1981 to 1996 period, metropolisation is identifiable in the west as well as the east; though certain peripheral areas in western Canada are growing faster than eastern ones, the western metropolitan areas are growing faster still.

2- People are more mobile in some areas (Saskatchewan and Manitoba) than others (Quebec, northern New Brunswick, Newfoundland)

Population growth and decline does not follow the same pattern as employment. In some areas, most notably Saskatchewan and Manitoba, population loss has paralleled employment loss, leading to the somewhat paradoxical situation that these areas, which have the poorest employment growth over the 25 year period of study, currently have some of the highest labour force participation rates. In other areas, particularly Quebec, northern New Brunswick and Newfoundland, similar employment decline has not been accompanied by commensurate population decline: this lack of propensity to migrate has led to very low rates of labour force participation.

3- Economic trends impact different peripheral populations differently

From points 1 and 2 it can be seen that there are two different logics at work: i) the metropolisation of economic activity, which is observed across Canada; and

ii) population decline, which is far more closely linked to provincial - and we suspect to cultural - factors than to the central/peripheral dichotomy. In other words, the problems faced by peripheral areas differ between peripheral areas, but not because the economic trends are dissimilar: the differences are due to the characteristics of the populations subjected to these trends and to differences in provincial (and local) policies.

4- Relatively high (and rising) incomes in peripheral urban areas; signs of social polarisation within metropolitan areas.

There is - in general - no major income problem in peripheral areas. Perhaps because the unemployed tend to migrate towards metropolitan areas, and because high wages are paid to many of those in work in peripheral areas, earned income per worker (or wages) are actually higher in some peripheral urban areas than in central ones. In addition, there is every indication that the transfer system is redistributing income from the wealthier to the poorer areas, and that this redistributive function has increased between 1971 and 1996.

A corollary of this remark is that a contrasted socio-economic picture emerges in metropolitan areas: high *and* low education levels are observed there, and labour force participation rates have dropped markedly since 1981. In other words, high average incomes and education levels mask large disparities within metropolitan areas: these disparities may be due, in part, to difficulties encountered by inward migrants (whether internal or international).

5- Peripheral areas are not low cost locations

A consequence of the above remarks is that peripheral areas cannot, in general, be considered low-cost locations. Quite apart from the costs associated with distance (freight, air-travel, time) which we have not covered in this report, high labour cost relative to similar urban areas close to large metropolitan areas is a further cost disincentive for the location of economic activity.

6- Probable importance of proximity to US border

The importance of proximity to markets underlies the trend towards metropolisation, but metropolitan areas are not the only markets: with growing cross-border trade, US markets are playing an ever increasing role in Canada's economic geography, a role which was evident in the nineteenth century prior to implementation of the national policy (Pomfret, 1981). Although this has not been tested statistically, it appears from our analysis and from observation of the maps that peripheral areas closer to US markets (southern Nova Scotia, New Brunswick), and indeed rural areas in Quebec and Ontario which benefit from both metropolitan and US proximity, are either growing or stabilising: these areas have not faced employment declines as marked as in Newfoundland, Gaspé, Côte-Nord, the eastern Prairies and other more remote peripheral areas. This hypothesis merits further investigation.

7- The difficulty of diversification: inertia of the location of economic activity between 1971 and 1996

A theme which runs through this report is the inertia observed with regards to the spatial distribution of most economic sectors. Between 1971 and 1996 the *relative* distribution across space of most sectors has remained unchanged.

This does not mean that regional economies have not substantially evolved: rather, it means that very few regions exhibit trends which differ from those observed for Canada as a whole. For example, it is clear that all regions have undergone rapid tertiarisation of their economies between 1971 and 1996, and that producer services have grown rapidly everywhere: but those regions which in 1971 had a more tertiarised economy tend to have the most tertiarised economies in 1996. Similarly, areas which had most producer services in 1971 have the most producer services in 1996.

This means that areas will tend to grow and decline as the sectors which are located there grow and decline: only in rare circumstances - at least on the basis of our analysis - will an area grow because it has been able to significantly modify its economic base. In other words, if employment is declining in primary

and low value added manufacturing sectors, and if peripheral regions specialise in these sectors, then it is highly probable that peripheral regions will decline.

This inertia is evident even if a narrow range of primary and low value added manufacturing industries are analysed: there is minor shifting of economic profiles, but very little evidence of major shifts away from resource based industries towards manufacturing.

Thus, policies of diversification which plan to change an area's economic structure at a rate which differs from that of the overall economy face an uphill struggle. This means that the relative position of regions will tend to remain unchanged, despite sometimes considerable absolute changes. However, diversification and other structural policies which accompany regional economies as they adapt to changing overall economic structures may be more viable.

Tables, figures, maps and annexes

note: Figures and maps are placed at the end of the section in which they are first referred to.
Most tables are inserted in the text. Those which aren't are placed at the end of the section in which they are first referred to.

Tables:

Maps:

Figures:

Annexes:

PART I

1. Introduction

Context

In November 2000 Economic Development Canada gave INRS the mandate of co-ordinating a research programme, conducted in conjunction with ICRDR (Institut Canadien de Recherche en Développement Régional), aimed at synthesising the current state of knowledge on the economies of peripheral regions. The programme is structured around three principal axes. The first of these is a detailed statistical analysis aimed at describing the spatial dynamics of Canada's economy, with some particular attention paid to regions in Quebec and Atlantic Canada. The second axis consists of detailed studies of a selection of peripheral regions in Quebec and Atlantic Canada. The aim of these studies is to obtain an in-depth understanding of the situation in each region - with particular emphasis on policy interventions and on the activities of local actors - , and to complement the broad-brush statistical approach.

The last axis consists of comparisons at the international scale. It consists of two parts. On the one hand, a workshop taking place in mid-October 2001 which will gather specialists from Canada, Finland, Norway, Scotland and Sweden. On the other, a literature review, completed in April 2001.

This document presents the results of our statistical analysis of the Canadian space economy and of the trends observed over the 1971 to 1996 period.

Document structure

The document is divided into three principal parts. The two introductory sections form the first part, in which the study's structure is detailed and the data, methodology and concepts introduced.

The following sections, sections 3, 4 and 5, present our analysis of the Canadian space economy and detail most of the important trends identified during the course of our research.

The third part, sections 6, 7, 8 and 9, mirrors the second part but uses multivariate methods that test some of the basic assumptions (particularly those regarding the spatial sub-division of Canadian territory) and that enable aggregates to be explored (such as the regional distribution of economic profiles) as opposed to single variables (such as the distribution of, say, the primary sector). Since broad conclusions in both parts corresponds, the third section serves to reinforce and deepen the analysis in part 2. Our overall conclusions are summarised in section 10.

2. Data, methodology and basic concepts

2.1 Data

A unique database has been constructed from census data in order to enable this detailed analysis of spatial trends in the Canadian economy. The data are unique because they combine three characteristics.

First, they cover the 1971 to 1996 period (data are available for 1971, 1981, 1991 and 1996), and are comparable both in terms of geographic boundaries and in terms of variable definitions over this period. Thus, they enable trends to be analysed over the long term.

Second, the level of geographic detail is high. Canada is divided into 382 distinct geographic units. Furthermore, these units distinguish between urbanised (CMAs, CAs and CSDs of over 10,000 inhabitants[1]) and non-urbanised areas.

Third, the number of variables available for analysis is high. The database comprises employment numbers for 142 distinct economic sectors (see annex 2) crossed with 6 occupational categories, and the entire 2B census profile (approximately 200 variables, depending on the year) for *each* of the 382 spatial units.

2.1.1 Geography

Two 'geographies' have been combined in order to arrive at the 382 distinct geographic units. On the one hand, the 152 urban areas (25 CMAs, 115 CAs and 12 CSDs[2]) with over 10,000 inhabitants in 1991 have been identified according the 1991 boundaries. All data for 1971, 1981 and 1996 have been adjusted to these urban boundaries. On the other, data covering the entire territory of Canada by 1991 Census Division (290 census divisions (CDs)) have been obtained. All data for 1971, 1981 and 1996 have been adjusted to these territorial boundaries.

[1] 1991 population figures have been used to select urban areas
[2] CMA: Census Metropolitan Area; CA: Census Agglomeration; CSD: census subdivision)

To create a single database data the urban areas have been subtracted[3] from data for the CDs within which they are located. In cases when an urban area overlaps a number of CDs, the CDs were first aggregated, and the urban area variables subtracted from the values for the aggregated area. The result of these geographic operations is a total of 382 distinct spatial units (SUs), 152 of which are 'urban' and 230 of which are 'rural' (Map 0).

2.1.2 Variables

Two separate sets of data are combined in this analysis. On the one hand detailed employment data, on the other data from 2B census profiles (socio-economic data).

The employment data for 1971 to 1991 were obtained prior to this project by Coffey and Polèse, and various analyses have been conducted (eg: Coffey and Shearmur, 1996; Polèse et Roy, 1999), though none which focussed upon development in outlying regions. The data were selected according to the 1970 Standard Industrial Classification (SIC) codes and the 1971 Standard Occupational Classification (SOC): 161 economic sectors and seven classes of occupation (including one undefined) were obtained. In the context of this study the data were updated to include the 1996 data, defined according to the 1981 SIC and 1991 SOC codes.

In order to make the economic sectors compatible, it has been necessary to aggregate some of the 1971 to 1991 sectors: the result is that there are 142 compatible sectors which can be analysed from 1971 to 1996. It has not been possible to adjust the occupational classification in this way since the 1991 SOC is radically different from the 1971 SOC. For this reason, no attempt has been made to ensure strict comparability: indeed, by 1991 the 1971 SOC was outdated, so the shifts observed between 1991 and 1996 in our data (particularly for some white collar occupations) are a necessary correction. In terms of

[3] All data have been transformed into additive variables. For instance, average earned income has been multiplied by number of people with earned income. Some variables - in particular values for median income - cannot be treated in this way.

occupations we therefore have 6 occupations[4] covering the 1971 to 1996 period, with a shift between 1991 and 1996 corresponding to the reclassification of some activities.

2.2 Some definitions

In the analyses which follow, a number of key concepts are used. They are defined as follows (see also map 0):

Metropolitan area: a CMA of over 500,000 inhabitants in 1991.

Urban area: a CMA, CA or CSD of over 10,000 inhabitants in 1991. It should be noted that Statistics Canada define a CMA and a CA as a group of adjacent municipalities with a high degree of social and economic integration (see annex 1).

Rural areas: all areas which are not urban areas. It should be noted that rural areas can contain towns, but these are necessarily smaller than 10,000 inhabitants.

Central areas: all areas within approximately 1 hour's drive (or 100 to 150 km) of a metropolitan area. The classification of areas in this way was introduced by Coffey and Polèse (1988) and subsequently used in studies such as Coffey & Shearmur (1996). The 382 areas studied have been classified in this way: account has been taken of the highway infrastucture, the spatial extent of the metropolitan area, and the characteristics of the area being classified. Thus, the central areas do not necessarily form perfect rings around metropolitan areas. It should be noted that the central areas thus define closely mirror the ZMIs (Zones of Metropolitan Influence) which Statistics Canada has introduced for the 2001 census.

Peripheral areas: this term has two slightly different meanings in the context of this study. Its basic meaning is 'all areas not classified as

[4] The 'undefined' occupation has been reassigned - proportionally - to the 6 defined occupations.

central or metropolitan'. This is its meaning in most of the following statistical analyses.

It should however be noted that in the context of our wider study for Economic Development Canada, a further constraint is added: in this wider context, a peripheral region does not include any urban area of over 150,000 inhabitants.

These definitions lead to the following classification of geographical areas. The codes correspond to those which are found in the figures and tables.

AM1: metropolitan areas of over 1 million inhabitants
AM2: metropolitan areas of between 500,000 and 999,999 inhabitants
AM = AM1 + AM2
AC1: central urban areas of between 100,000 and 499,999 inhabitants
AC2: central urban areas of between 50,000 and 99,999 inhabitants
AC3: central urban areas of between 25,000 and 49,999 inhabitants
AC4: central urban areas of between 10,000 and 24,999 inhabitants
AC = AC1+AC2+AC3+AC4
AP1: peripheral urban areas of between 100,000 and 499,999 inhabitants
AP2: peripheral urban areas of between 50,000 and 99,999 inhabitants
AP3: peripheral urban areas of between 25,000 and 49,999 inhabitants
AP4: peripheral urban areas of between 10,000 and 24,999 inhabitants
AP = AP1+AP2+AP3+AP4
RC: central rural areas
RP: peripheral rural areas

Each of these twelve classes is called a 'synthetic region' (or SR) in the analyses which follow. In a number of tables and figures the sum or mean of a particular variable is calculated across all spatial units within each of the classes: since the SUs over which these calculations are made are not necessarily adjacent, the adjective 'synthetic' is added.

2.3 Methodology

In the following sections, a variety of different approaches are used to analyse these data. The principal aim of these approaches is to understand to what extent key variables (relating to both employment and to socio-economic characteristics) vary over the classes described in section 2.2 above. To this end measures of relative concentration (location quotients) and absolute value - together with their changes - are calculated for spatial units (SUs) classified by centrality and urban size.

There are two ways of doing this. The first is to create 'synthetic regions', for which all data from SUs of a particular class are aggregated. The aggregate data are then compared. Most of the analysis is of this sort. The second is to calculate mean or rank values for each class of SU - in effect using statistics (parametric or not) to compare a given variable over classes. Only in section 9 is this undertaken. However, it should be emphasised that both approaches have been tested, and the overall results of inter-class comparisons remain very similar for most variables whichever the approach: therefore only one type of analysis is presented to make a given point.

As can be surmised, our analysis depends strongly on the a-priori classification of regions (urban/rural and central/periphery). This classification reflects the purpose of the analysis, i.e. to identify the extent to which trends evident in peripheral regions are specific to these regions. However, it is useful to examine whether alternative approaches to classification pick out 'peripheral' regions: in other words, do peripheral regions have something else in common - as regions - other than their geographic position relative to metropolitan areas? Sections 6, 7 and 8 apply cluster analysis to data covering overall economic structure, primary and first transformation activities and income structure in order to investigate the extent to which peripheral areas are unique.

Finally, in section 9 some basic multivariate analysis is performed on a selection of key variables to provide some indication of the way in which the various

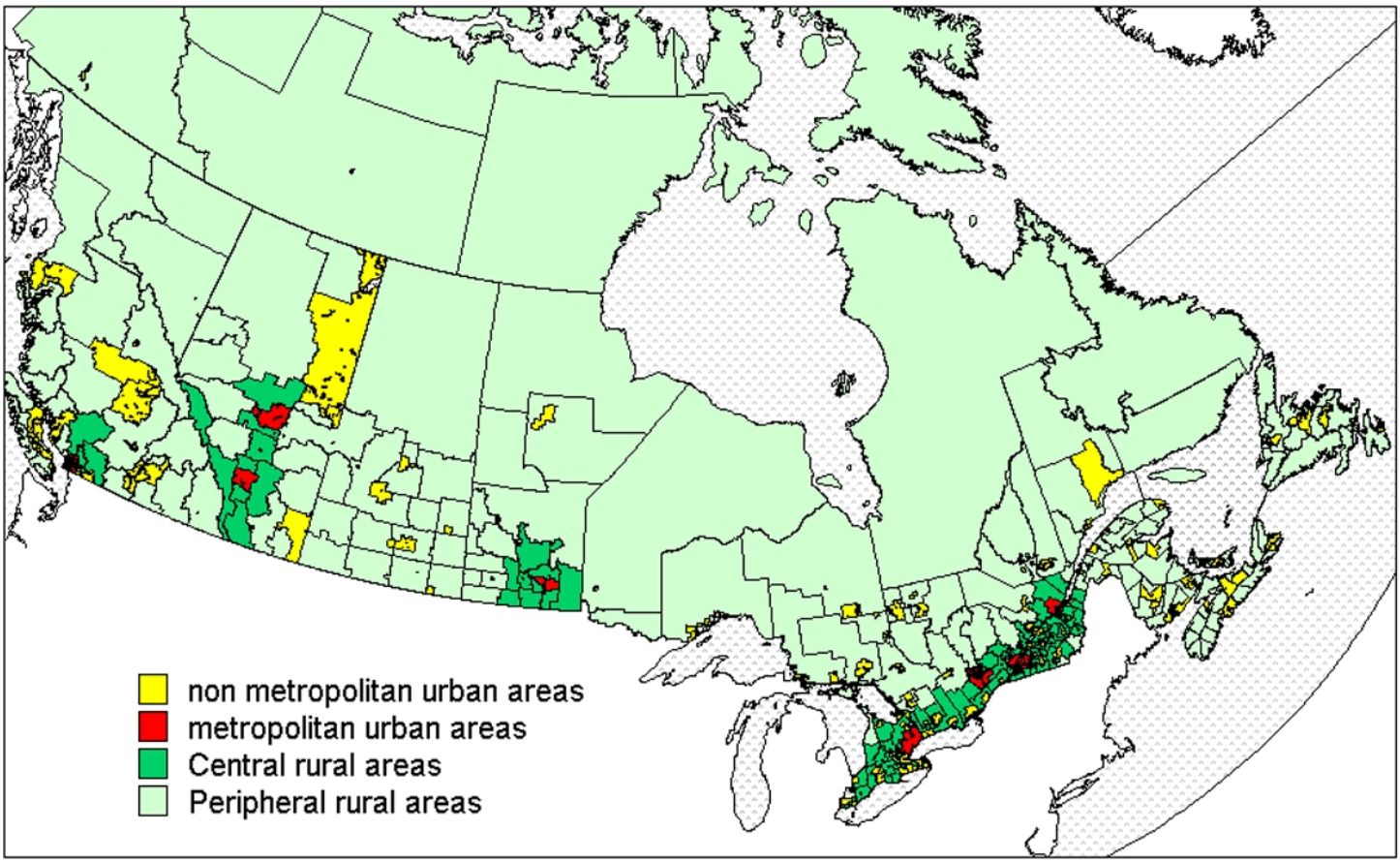
classification schemes interact. In particular this section seeks to verify that the variation of certain key variables over SRs is not attributable to variation over provincial boundaries or over zones with similar economic profiles.

In each section, some basic details will be given about the nature of the analyses performed, but the emphasis will be on interpreting results. References are given to articles or reports in which the precise methodology is described in detail.

At this point, it is important to emphasise that all data are by place of residence. This should be borne in mind when interpreting results since it is quite possible that actual jobs are located in SUs other than the place of residence. We feel that this is of particular relevance to SUs adjacent to metropolitan areas, which are in the RC (rural central) class, and maybe to certain peripheral SUs from which workers seasonally migrate. This caveat does not invalidate our results, but will influence our interpretations and conclusions.

To conclude this brief methodological overview, it is worth pointing out that the report presents the results of exploratory analyses of a vast database. A sizeable proportion of our work so far has consisted in building and validating the database. It is expected that more elaborate hypotheses will be tested in more rigorous ways once the basic trends - as described in this report - are understood.

Map 0. Centre-periphery Divisions and Urban Centres, Canada



PART II

3. Geographic trends: total employment and total population

In this section two key variables are analysed in order to describe the trends underlying the development of Canada's space economy over the 1971 to 1996 period. First, total employment is considered, then total population.

For each variable, two approaches are taken. The first approach is based upon 'synthetic regions' (SRs, see section 2.3). The relative growth of the variable in each SR is described. The second approach is based upon the observation of maps of Canada. Whilst not as systematic, such an approach enables spatial variations in the phenomena under study to be described: the visualisation of data is recognised as a key exploratory technique (Fotheringham et al, 2000) in quantitative geography.

3.1 Total employment

Over the 1971 to 1996 period, the fastest growing SR has been AM2 (table 1), the smaller metropolitan areas (102%). Its growth was particularly rapid over the 1971 to 1981 period (70%), but slowed somewhat over the later years (19%).

Table 1: Growth rates and total employment over the synthetic regions, 1971 to 1996

	71 to 96	71 to 81	81 to 96	*Total 1971*	*Total 1981*	*Total 1991*	*Total 1996*
AM1	**78%**	42%	**26%**	*2770201*	*3925121*	*4753927*	*4 943 655*
AM2	**102%**	**70%**	19%	*750113*	*1272555*	*1461678*	*1 515 890*
AC1	69%	35%	**25%**	*801510*	*1083829*	*1298346*	*1 351 390*
AC2	**83%**	**44%**	**27%**	*246854*	*356044*	*432552*	*451 825*
AC3	48%	33%	11%	*133369*	*177384*	*194658*	*197 685*
AC4	60%	37%	17%	*94883*	*130248*	*150150*	*152 065*
AP1	71%	41%	**21%**	*577185*	*812865*	*953238*	*987 090*
AP2	75%	**50%**	17%	*207837*	*310893*	*341535*	*362 840*
AP3	**86%**	**57%**	18%	*222764*	*350004*	*391620*	*414 210*
AP4	52%	41%	7%	*175990*	*248712*	*260623*	*267 030*
RC	**97%**	**54%**	**28%**	*612736*	*941551*	*1131518*	*1 208 080*
RP	62%	43%	13%	*920053*	*1320017*	*1444720*	*1 493 840*

note: for each period, the five fastest growing regions are shown in bold

It is the central rural region (RC), which has grown second fastest over the entire period (97%), and fastest over 1981 to 1996 (28%). Over this latter period, employment growth in the rural fringe of metropolitan areas has been mirrored by growth in large metropolitan areas themselves (AM1: 26%), by growth in the

larger central urban areas (AC1: 25%; AC2: 27%), and by growth in the largest peripheral urban areas (AP1: 21%).

A number of remarks can be made. First, over the latter period, there is a tendency for growth to be faster in large urban areas, and in central areas. In other words, except for the largest peripheral urban areas (those of between 100,000 and 499,999 inhabitants - which are in effect local metropoli), urban and rural areas in the periphery have grown more slowly over the last 15 years. Second, the fastest growing areas are the central rural ones (RC). This may reflect two combined processes: on the one hand, an increase in longer distance commuting towards the metropolitan centres, on the other job creation in these areas.

Over the first period - 1971 to 1981 - the pattern was different. There was a marked tendency for total employment to grow faster in smaller rural urban areas, and the slowest growing SRs were centrally located urban areas. There has thus been a change in overall employment trends across synthetic regions, with peripheral areas and smaller urban units displaying weaker growth over 1981 to 1996.

Maps 1 and 2 provide a visual indication of the growth rates of total employment for the two periods under consideration. From Map 1 it can be seen that over the 1971 to 1981 period there is a marked east-west divide. Most areas to the west of Manitoba display rapid employment growth. In particular the peripheral regions in Alberta, and some of those in Saskatchewan and British Columbia, display relatively rapid rates of growth (of over 50% for the decade). However, it can be noted that some of the fastest growing areas, even in the west, are clustered around large urban areas (for example between Calgary and Edmonton). To the east, there are pockets of very slow growth or decline. In particular these can be found in the maritime provinces, in certain parts of Quebec (Gaspésie, Bas St.Laurent, Côte Nord, the Mauricie), in Northern Ontario and in Northern Manitoba. In addition, the southern parts of Saskatchewan also display slow growth over the period. A final feature of note is the relatively rapid employment

growth in rural areas surrounding Montreal and Toronto, and in some areas extending south east of Montreal along the US border.

Over the 1981 to 1996 period (map 2) a marked difference can be seen. With few exceptions all peripheral areas, whether to the east or to the west, display very slow growth, if not outright decline. This is true in particular in the Maritimes (with the exception of Southern New Brunswick and Nova Scotia around Halifax), in the entire Gaspé peninsula, in certain peripheral areas in Northern Quebec, in Northern Ontario and - very markedly - in most of Saskatchewan and Manitoba. Even in Alberta and British Columbia, despite faster growth rates than in the east, in general it is those areas closer to large metropolitan areas which grow faster than those further away. Whether one looks at St.John's, Halifax, Moncton, Montreal, Toronto, Winnipeg, Regina, Calgary or Vancouver it is the cities themselves or the nearby areas which are displaying the faster growth rates. The few peripheral regions which display rapid growth rates tend to be in the far North or the Territories.

This analysis of trends in total employment illustrates one of our principal results, namely the tendency of economic activity to concentrate in and around larger urban areas: the phenomenon of metropolisation is evident in Canada.

3.2 Total population

Whilst the population growth rates (table 2) differ from those of employment, the general patterns mirror those of total employment. Whereas over the first decade, population rose fastest in the smaller metropolitan areas and in peripheral areas, the subsequent fifteen years witnessed a reversal of the trend with the fastest population increases in the larger central cities. In addition, it is the rural areas surrounding large metropolitan areas (RC) which have benefited from the substantially faster population growth over 1981-1996 than peripheral rural areas (RP): in these areas population growth has been extremely low over the entire period of study.

This reminds us of the discrepancy - particularly in rural areas - between rapid growth in employment (at least for certain periods) and very slow growth in population.

Table 2: Growth rates and total population over the synthetic regions, 1971 to 1996

	71 to 96	71 to 81	81 to 96	*Total 1971*	*Total 1981*	*Total 1991*	*Total 1996*
AM1	**42%**	10%	**29%**	*7 179 370*	*7 929 750*	*9 450 425*	*10 212 905*
AM2	**48%**	**25%**	**19%**	*2 010 630*	*2 505 945*	*2 863 740*	*2 984 085*
AC1	**34%**	10%	**21%**	*2 129 235*	*2 350 825*	*2 695 880*	*2 855 155*
AC2	**42%**	**14%**	**25%**	*690 135*	*786 440*	*920 745*	*980 590*
AC3	17%	8%	8%	*382 995*	*412 850*	*435 505*	*447 845*
AC4	29%	10%	**16%**	*269 865*	*298 050*	*333 540*	*346 860*
AP1	28%	**12%**	14%	*1 671 220*	*1 864 260*	*2 061 480*	*2 132 680*
AP2	**34%**	**18%**	13%	*588 785*	*695 220*	*750 390*	*787 875*
AP3	**35%**	**21%**	12%	*702 830*	*847 440*	*902 890*	*945 795*
AP4	13%	9%	4%	*529 035*	*577 385*	*585 115*	*598 565*
RC	28%	10%	**16%**	*2 027 225*	*2 236 700*	*2 435 275*	*2 593 440*
RP	8%	6%	2%	*3 386 930*	*3 578 530*	*3 558 815*	*3 642 220*

Our analysis shows that this could be due to a number of factors, of which two stand out. At the beginning of the period a very small proportion of the workforce - particularly in rural areas - was female. This proportion rose far more rapidly in rural areas than in urban ones, the proportion for all SRs showing a tendency to converge (figure 1). Thus, for a modest rise in population a rapid rise in employment is possible, particularly in rural areas. The second explanation is demographic. There has been a rise in the proportion of working age population over the period studied, and a decline in the proportion of the total population below the age of 15 (figure 2). This demographic shift has been more marked in rural areas. These two factors combine to explain the differences between population and employment growth rates.

However, these explanations also underline the fact that rural peripheral areas are growing more slowly than others. Indeed, despite the fact that both these factors (feminisation and decrease in population under 15) tend to accelerate employment growth rates (to the extent that they accelerate the growth in active working age people) the slow employment growth in rural areas over the last fifteen years (relative to growth in other SRs) is all the more significant.

The map of population growth rates for the 1971 to 1981 period reveals an east west divide similar to that observed for employment growth (map 3). However, unlike for employment - where growth is observed in most areas over the period, population decline can be observed in southern Saskatchewan and Manitoba, in Northern Ontario, in most of Quebec outside the central areas and in certain parts of the Atlantic provinces (northern New Brunswick, North western Nova Scotia and central and western Newfoundland). The provinces of Alberta and British Columbia display fast population growth over the decade in most areas.

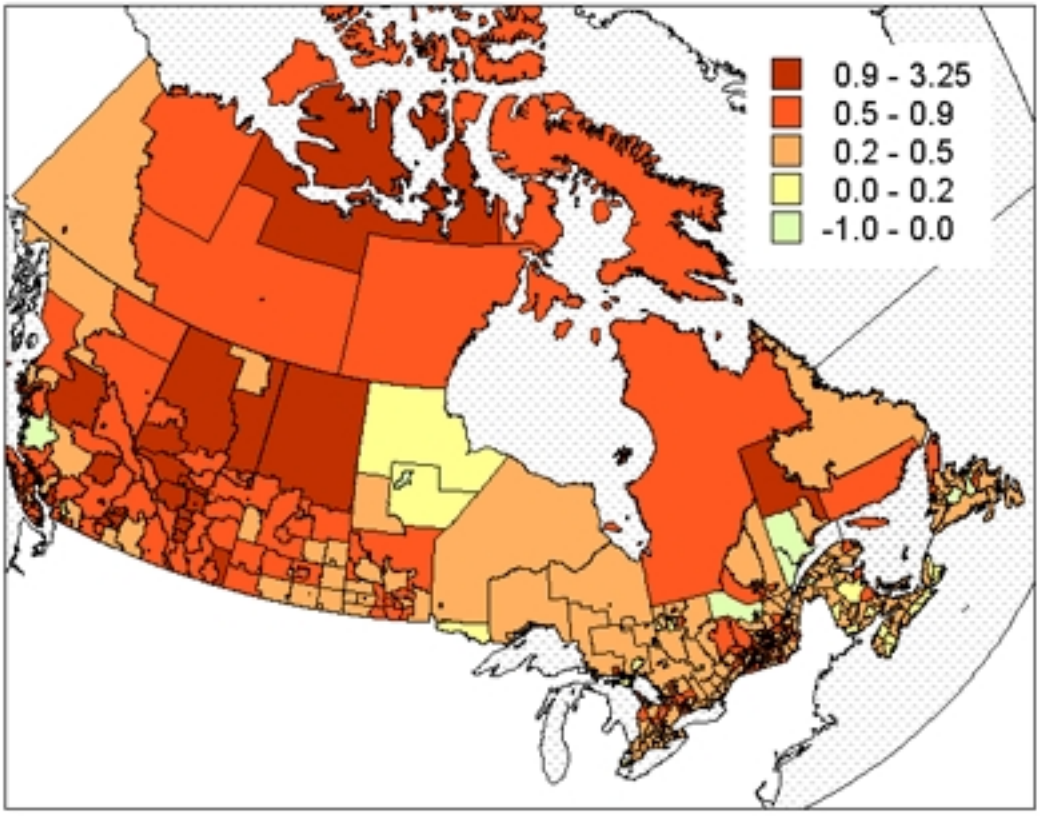
Between 1981 and 1996, the map of population loss stays broadly similar, though more areas are affected (map 4): almost every area east of Montreal, with the exception of southern New Brunswick and central Nova Scotia has experienced population decline over the period. In fact the only zones of systematic population growth in eastern Canada are those lying between Montreal and Windsor: these are areas classified as central or metropolitan. To the west population decline is evident in Northern Ontario, and in most of Manitoba and Saskatchewan. The peripheral areas of British Columbia and Alberta, whilst fairing better than their eastern counterparts, only display modest growth relative to the urban and central areas in the provinces.

3.3 Conclusion

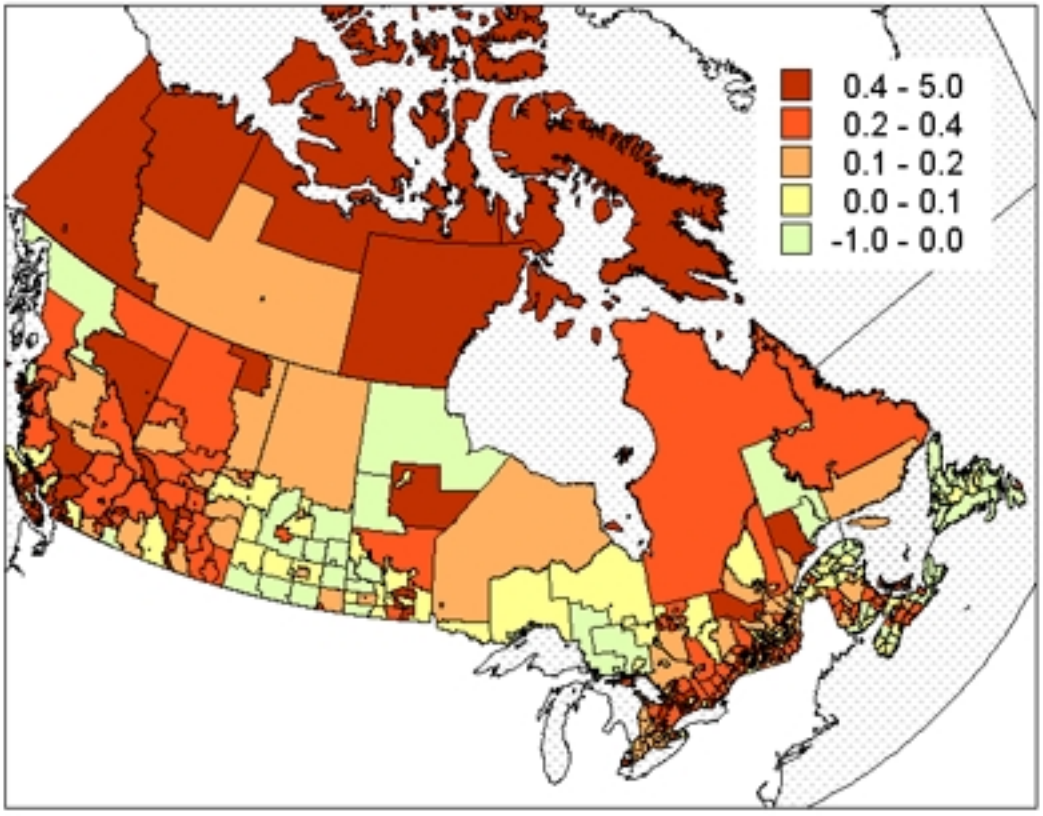
From the perspective of peripheral areas, whether urban or rural, the trends identified in this section are negative. There is clear evidence that between 1981 and 1996 these areas have suffered from employment growth at rates well below central and metropolitan areas. In addition, population decline is evident from 1971 onwards, and has intensified since 1981. The low positive rates of population growth exhibited in table 2 for rural peripheral areas reflect the growth occurring in rural areas surrounding peripheral centres such as Halifax and Moncton, and that occurring in some isolated rural peripheral areas elsewhere.

In section 4 the evolution of the synthetic regions' economic structure will be analysed.

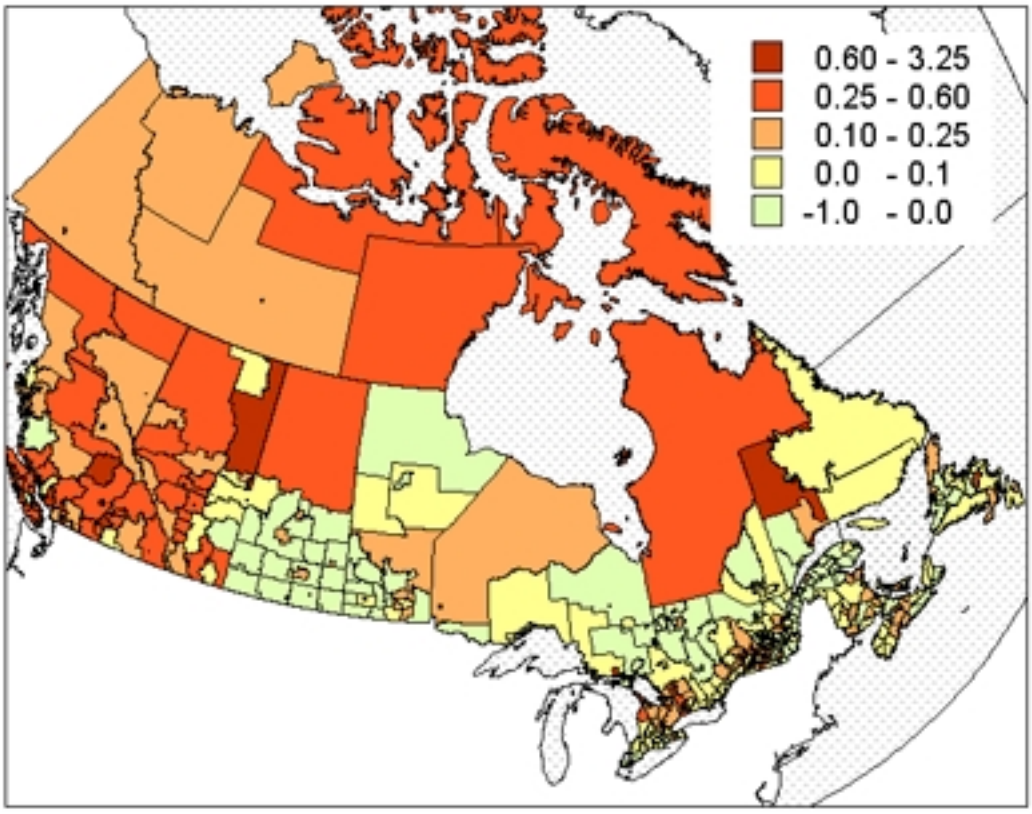
Map 1: Total employment growth, 1971-1981



Map 2: Total employment growth, 1981-1996



Map 3: Population growth, 1971 to 1981



Map 4: Population growth, 1981 to 1996

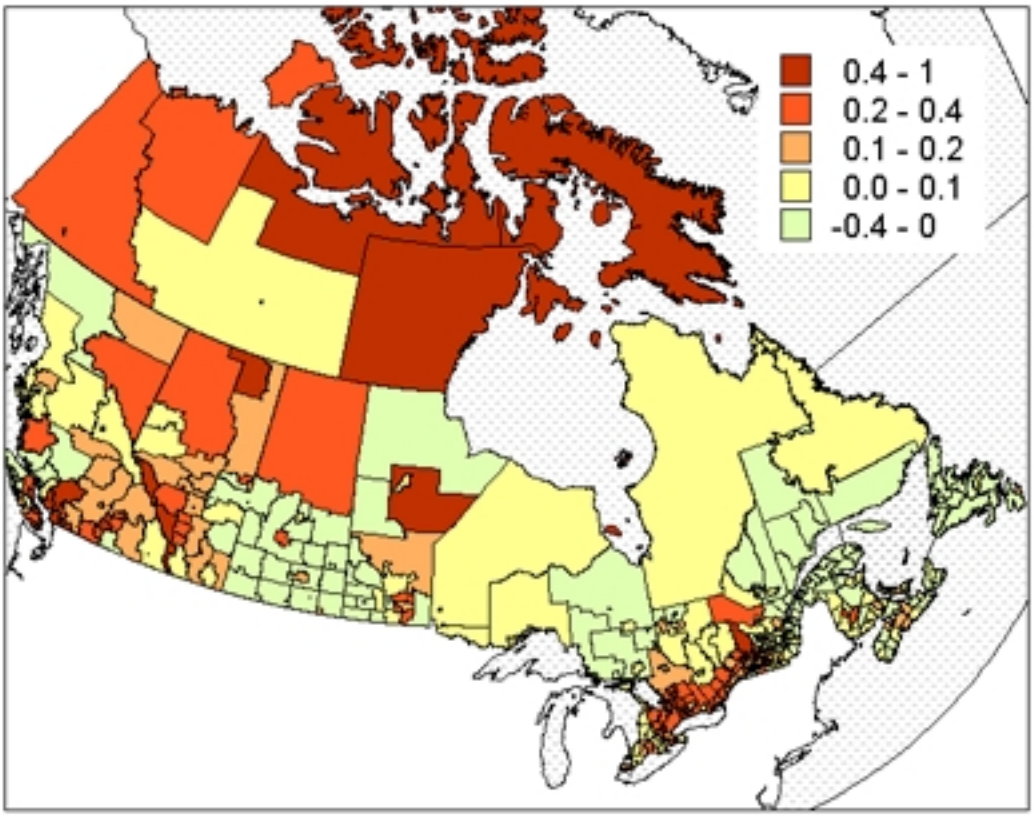


Figure 1: Proportion of females in the workforce, 1971-1996

% difference with average for metropolitan areas

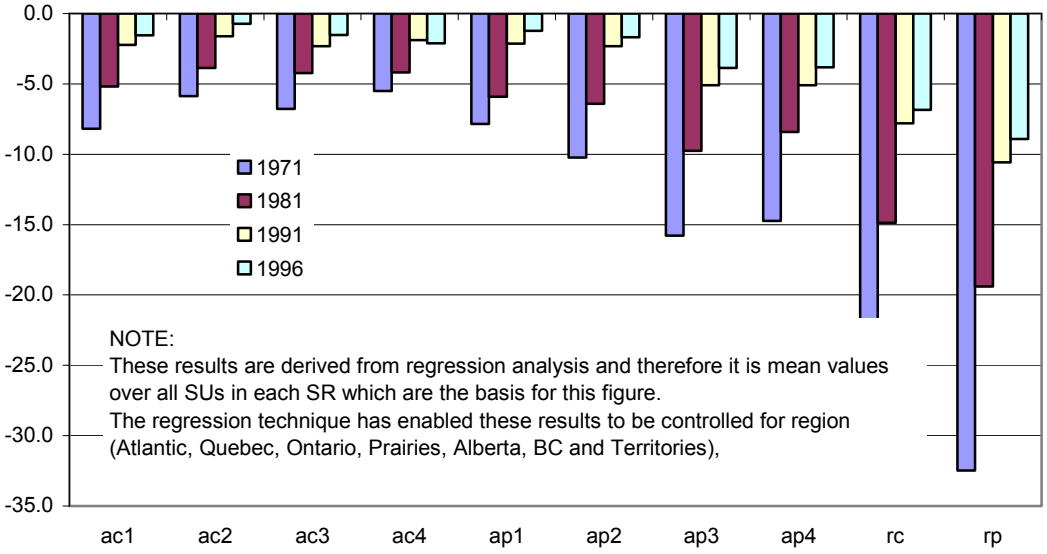
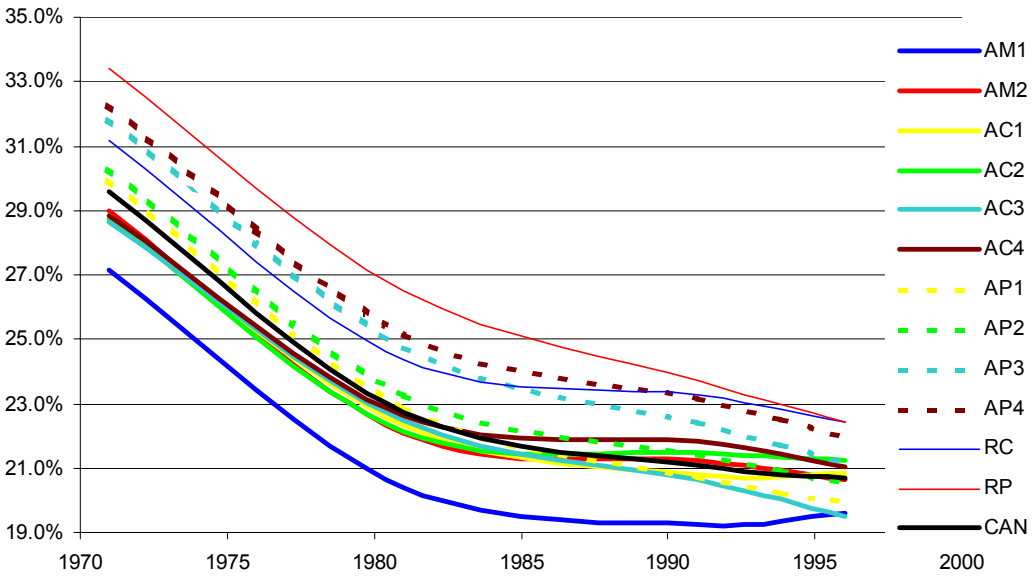


Figure 2: Percentage of the population below 15 years of age



4. Geographic trends: economic sectors

As overall employment in many outlying regions declines, it is useful to examine the nature of their economies in relation to the wider economy. In this section we therefore identify the economic sectors which predominate in each type of synthetic region, and assess whether these regions are increasing or decreasing their economic specialisation in each sector.

To do this we have aggregated the 142 sectors available for analysis into 18 economic sectors (annexes 2 and 3). This classification is based upon the 15 sector classification used by Coffey & Shearmur (1996) but with a more detailed subdivision of manufacturing (3 sectors instead of 1) and producer services (2 sectors instead of 1).

The approach used is sectoral. In other words, each sector is analysed in order to assess in which type of synthetic region it tends to locate. To do this, location quotients are calculated for each sector in each SR. The analysis is *not* based upon mean values of the location quotients but on location quotients calculated for each SR in its entirety. Thus:

$$LQ_{xa} = \frac{\left[\sum_{i=1}^{n} e_{xi}^{a}\right] \Big/ \left[\sum_{i=1}^{n} e_{i}^{a}\right]}{E_x / E}$$

where

LQ_{xa} = location quotient of sector x in synthetic region a
n = number of spatial units in synthetic region a
e_{xi} = employment in sector x in spatial unit i
e_i = total employment in sector x in spatial unit i
E_x = total employment in sector x in Canada
E = total employment in Canada

It should be noted that the analysis of mean and rank values gives similar results to those presented below. When interpreting the results, the following should be borne in mind:

- it is possible for LQs to rise in an SR even when overall employment is falling, and it is possible for LQs to fall when overall employment rises. LQs measure the *relative* concentration of employment. Thus, a high and rising LQ indicates that the SR has a higher % of employment in the sector than other SRs (high LQ), and that this % is rising faster than in other SRs (rising LQ).
- an increase in a sector's LQ can be due to faster employment growth in the sector or to slower employment decline - *relative to the rest of employment in the SR.* Thus, if there is a marked rise in the concentration of retail employment in urban peripheral regions this could either mean that retail employment has grown faster there than employment in other sectors *or* that other sectors have declined faster than retail.
- for these two reasons, variation in location quotients should always be interpreted together with sectoral growth rates.

4.1 Economic sectors in peripheral regions

Bearing in mind the concentration of certain manufacturing and primary industries in peripheral regions (this is confirmed by our analysis of the 18 sectors), four sectors will be examined closely (primary sector, low , medium and high value added manufacturing). In addition, wholesale, hospitality trade and high order services will also be examined since they are often considered as possible means whereby peripheral regions may turn round their economies (in particular by way of tourism and/or the attraction of footloose services relying on internet). Results for all 18 sectors are presented in tabular form (table 3a (location quotients) and table 3b (growth index)) but the remaining sectors will only be commented upon briefly.

4.2 Goods producing sectors

4.2.1 The primary sector

This sector comprises forestry, fishing, resource extraction and agriculture. Figure 3a shows the concentration (location quotient) of this sector over the 12 SRs. Since this type of figure will be presented for all other sectors analysed, it is worth explaining it here.

The vertical axis of figure 3a is a measure of relative concentration, the location quotient (LQ). If the LQ has a value greater than 1 for a given SR then this SR tends to have higher concentrations of the sector under study (in this case the primary sector) than the Canadian economy as a whole. Conversely, a value below one indicates that the sector is underrepresented in the SR relative to the rest of Canada.

Along the horizontal axis are identifiers for the various SRs. All urban areas (including metropolitan areas) are ordered from left to right by decreasing size. In this way it can be seen whether the concentration of any given sector (in this case the primary sector) increases or decreases with urban size. At the right of this scale is the identifier for rural areas, r.

It will be noted that the horizontal axis does not distinguish between peripheral and central SRs. The central (including the metro areas) SRs are graphed separately from the peripheral ones, enabling one to see whether urban size has a similar effect in peripheral and central areas. Thus, figure 3a has four curves. One curve (labeled 1971 C) represents location quotients for central SRs in 1971; another (labeled 1971 P) represents location quotients for peripheral SRs in 1971. The two remaining curves, 1996 C and 1996 P display the same variables for 1996.

It can be seen from figure 3a that the concentration of employment in primary sectors increases steadily as urban size decreases. Rural areas are very heavily dependent on employment in this sector, with 2,5 to 3,5 times the concentration of the Canadian economy. The peripheral curves are systematically above the central curves, indicating that peripheral areas are more heavily dependent upon primary sector employment than areas close to large metropolitan areas. Indeed there is not one central urban SR which has an LQ above 1. In peripheral SRs, it is the smallest urban areas (below 25,000) and the rural areas which are most heavily dependent.

One of the most striking features of figure 3a is the similarity between the 1971 and the 1996 graphs. This indicates that despite profound economic restructuring

that has been observed between 1971 and 1996, the *relative* distribution of employment in the primary sector has remained on the whole unchanged across the SRs.

This statement can be qualified by observing figure 3b. Notwithstanding the overall stability noted above, it can be seen that employment growth in primary sector employment has been more rapid in all central areas, whereas it has stagnated since 1981 in all peripheral areas. This is an indication that within many resource industries managerial and head office activities (usually located centrally) are growing relative to the actual extraction work.

In sum, it can be said that the reliance of peripheral areas upon primary activities has remained unchanged over the last 25 years. However, this statement (which is about *relative* concentration) masks the fact that in a context of overall economic stagnation and decline in peripheral regions (see section 2), similar *relative* concentration over 25 years signifies *absolute* stagnation and decline.

4.2.2 Low value added manufacturing (LVA)

This sector comprises all first and some second transformation manufacturing industries principally in the food, wood, metal or clothing industries. The location and growth of these sectors across SRs is particularly important since there are many calls for attracting transformation industries to resource-based regions as a means of compensating for the declining primary sector.

The first remark to be made about figure 4a is its different scale from figure 3a (primary sector): indeed, the extreme values are far closer indicating a more even distribution of employment across the SRs.

In general, there is a tendency for first transformation industries to concentrate in small central urban areas, and this is true in 1971 and 1996. Rural central areas also have high concentrations of employment in this sector, a concentration which in 1996 exceeds the highest value for peripheral areas.

Unlike employment in the primary sector, the relative distribution of employment across SRs for LVA has evolved somewhat between 1971 and 1996. There has

been a shift away from larger urban SRs to smaller ones and to rural areas, both in central and peripheral areas. There has also been a shift away from large metropolitan areas.

This can be observed in figure 4b, where it can be seen that central rural areas have grown the fastest between 1971 and 1996, and are the only areas where LVA employment has not declined markedly since 1981. Peripheral rural areas, after rapid growth during the seventies, have suffered a decline as precipitous as all other areas (except central rural areas) since 1981.

These observations do not lend credence to the aim of attracting transformation industries to peripheral resource dependent regions: indeed, the evidence suggests that, within a context of overall sectoral decline LVA employment is gathering in small towns and rural areas surrounding major metropolitan areas.

4.2.3 Medium value added manufacturing (MVA)

This sector comprises certain second and third transformation manufacturing, and the production of finished goods not generally classified as high-tech.

Figure 5a illustrates the overwhelming tendency for MVA employment to locate in large urban areas close to metropolitan areas. There is a certain tendency for MVA employment to increasingly concentrate in smaller (but still central) urban areas and in central rural areas. However, with location quotients of around 2 in all central urban areas, the contrast is striking with peripheral urban areas where location quotients are around 0,45 irrespective of size. It can be noted, however, that since location quotients in peripheral areas were systematically lower in 1971 than in 1996, there is a tendency - albeit one which does nothing to overturn the broader picture - for MVA employment to increase its concentration in peripheral areas.

This is confirmed by considering figure 5b. The fastest growth in MVA employment (albeit from a small base) is in peripheral rural areas; the growth in central rural areas is only slightly slower (but larger in terms of absolute numbers), as is that in peripheral urban areas. Thus the increase in

concentration is not due to slower decline than the rest of the peripheral economy but to employment growth in these sectors.

4.2.4 High value added manufacturing (HVA)

This sector comprises sectors commonly referred to has 'high-tech' manufacturing (aeronautics, telecommunications and electronic equipment, office machines, scientific and professional equipment, pharmaceuticals).

HVA employment is highly concentrated in the largest metropolitan areas, and this has remained broadly unchanged over the 25 year study period (figure 6a). Outside these areas, the concentration of HVA employment increases as one moves to smaller central urban areas, but is very low in the smallest of these (10,000 to 25,000 people) and in central rural areas. It should be noted, however, that between 1971 and 1996 the LQ for HVA employment has increased in rural areas. There are low concentrations of HVA employment in all peripheral SRs: in addition, the LQs for the largest peripheral urban areas have substantially declined between 1971 and 1996.

From figure 6b it can be seen that the fastest growth rates for HVA employment have occurred in rural areas both central and peripheral. It is important to note that even in 1996 neither of these SRs includes over 10,000 HVA jobs. Apart from rural areas it is central urban areas which have registered the fastest growth rates though this tailed off over the recessionary 1991-1996 period. The steady but slower growth of HVA employment in metropolitan areas hides the fact that by far the greatest number of HVA jobs have been added in these SRs. Finally, between 1971 and 1996 there has been no HVA employment growth in peripheral urban areas.

This analysis confirms other studies (Britton, 1996; Shearmur 1997) which emphasise the metropolitan nature of HVA employment.

4.3 Service sectors

In a context of rapid tertiarisation of the economy the evolution of service employment requires analysis as detailed - if not more so - than that of goods

producing employment. In this section three 'key' sectors will be analysed in detail. These sectors illustrate three distinct patterns: the wholesale sector illustrates a dramatic shift from peripheral to central areas, the hospitality sector is an indicator of the distribution of tourist related employment, and high-order services, as the fastest growing and potentially most footloose segment of the economy, provides an indication of the location trends of newer segments of the economy. The remaining service sectors will be discussed together, with full details of concentration and growth rates being presented in tabular form.

4.3.1 Wholesale employment

From figure 7a it can be seen that in the early 1970s high concentrations of wholesale employment could be found in metropolitan areas, and in the larger peripheral urban areas. In other words this type of employment was concentrated towards the top of the urban hierarchy in large national and regional urban centres. In addition, smaller peripheral urban areas tended to have significantly higher concentrations of wholesale employment than their central counterparts. By 1996 this sector's distribution has changed. It remains concentrated in metropolitan areas, but its concentration has increased markedly in central urban areas of between 25,000 and 499,999 inhabitants, as well as in central rural areas. In contrast, all peripheral areas have seen the LQ for wholesale employment drop significantly. The only exception is a small increase in peripheral rural areas. On the whole, then, it can be seen that wholesale employment, which in 1971 was more highly concentrated in larger peripheral urban areas, is, in 1996, more highly concentrated in larger central urban areas.

Although employment in the sector has grown over the entire period (figure 7b), growth has been substantially faster in all central areas (particularly in central rural areas) and has been slowest in peripheral urban areas. There has thus been a marked relative shift from the periphery to the centre.

4.3.2 Hospitality sector

This sector comprises employment in hotels, restaurants, bed and breakfasts and camping grounds. Whilst such employment clearly does not constitute all

tourist related employment, and whilst some employment in this sector is unrelated to tourism, we feel that it is a good indicator of trends in tourist related employment, even if it does not provide an accurate idea of the number of jobs involved.

Amongst the sectors analysed so far, the hospitality sector displays the 'flattest' relative concentration across the SRs (figure 8a). Indeed, the maximum LQ is 1.27 (for AP2 urban areas in 1996) and the lowest is 0.91 for AM1 metro areas in 1996). This reflects the fact that the sector remains, basically, a low-order service which, like retail, is fairly evenly distributed across all SRs (see table 3a). Within this narrow range it is notable that between 1971 and 1996 the concentration of hospitality employment has increased in *all* central SRs except for the very largest agglomerations (where it remains virtually unchanged) and central rural areas. In the periphery there is an increase in the concentration of hospitality employment in the largest urban areas, no change in the smaller ones and a large decrease in concentration in peripheral rural areas.

Employment growth in this sector has been virtually identical in agglomerations in central and peripheral urban areas and in central rural areas (figure 8b). Only in peripheral rural areas has employment increased significantly less than in other SRs. These similar growth rates mask faster growth in larger peripheral urban areas, and slower growth in larger central urban areas.

To the extent that these trends reflect those linked to the tourist trade, it is clear that tourism employment is predominantly an urban and a central phenomenon. Smaller cities in the vicinity of large metropolitan areas are increasing their reliance on the industry, as are the larger peripheral urban areas. The one type of SR which is clearly not benefiting from tourism is the rural periphery - the type of region in which much hope is vested in this industry.

4.3.3 High-tech producer services

This sector comprises computer services, management consulting and engineering and architectural services. In this report these are distinguished from professional services (legal, accounting, advertising...).

These sectors are archetypal high-order services in the Christallerian sense of the term. They are highly concentrated in large metropolitan areas (figure 9a) and this concentration decreases with urban size, stabilising around LQ= 0.4 at city sizes of below 50,000 and in rural areas. This relationship holds over the 25 year study period in central and peripheral areas. From table 3a it can be seen that a very similar pattern holds for professional services, with one difference: central and peripheral rural areas have benefited from an increase in the concentration of professional services. However, the LQ for professional services remains very low in these SRs (below 0.60 in 1996).

Growth in high-tech producer services has been fastest in central rural areas, and faster in all central areas (agglomerations and urban areas) than in peripheral areas (figure 9b). It should be noted that growth rates in this sector are very high: growth of close to 1000% is recorded in central peripheral areas, of over 600% in agglomerations and central urban areas. Even in the slowest growing rural peripheral areas high-tech service employment has grown nearly 400%. Growth in professional services over 1971 to 1996 has been slower (table 3b; around 325%) and though it has been fastest in central rural areas (485%), it has also been fast in peripheral rural areas (385%).

The study of high-order producer services reflects some of the profound structural changes which have operated in the economy over the 1971 to 1996 period. Thus, very high growth rates in all SRs come as no surprise. However, these changes appear to benefit central areas and metropolitan areas more than they do peripheral areas. This is not in contradiction with the fast growth rates recorded in peripheral areas: it is only meant to underscore the even faster growth and rise in concentration recorded in the vicinity of metropolitan areas.

4.3.4 Other service sectors

By definition it is not possible for concentration in all sectors to fall in peripheral regions, and we have indeed noted that in some cases rising concentrations are observed. But the overall picture which emerges from the sectors highlighted above is a shift of economic activity away from peripheral areas towards central

areas, and, to some extent, from rural and smaller settlements towards larger ones. The question which this last section on services will address is the following: amongst the 18 sectors studied are there any which go against the trend?

One notable exception - but one which nevertheless confirms the overall trend - is retail employment. Indeed, over the 25 year period the concentration of retail in all peripheral areas (except for the largest urban areas) has significantly increased. This is also true to some extent in the entertainment sector - especially for smaller peripheral areas: this may therefore be a more positive indicator for tourism. A final sector for which this is true across the board is education: whereas in health and social security and in public sector employment there has been either no movement or a decline in concentration in peripheral areas, in the education sector there has been an across-the-board increase in all peripheral areas. These sectors for which concentration has risen in peripheral areas all have a large low-order component: in other words, they tend to be non-exportable sectors which primarily serve the local population. Their rise in concentration may be due to the decline in other sectors rather than to any particular vigour in the sectors themselves.

In terms of employment growth, the fastest growing SR in almost all sectors is central rural areas (table 3b). Although peripheral areas do not systematically display slow growth in all sectors, they rarely grow faster than their more central counterparts.

Thus, the only sectors which are significantly increasing their concentration in peripheral areas are service related ones, in particular retail and education. To a lesser extent this is also true for hospitality employment (in the larger peripheral urban areas) and leisure related employment (in the smaller peripheral urban areas). FIRE and professional services employment are, somewhat surprisingly, increasing their concentration - and growing quite fast - in rural peripheral locations: we hypothesise that this is related to the move of certain categories of

professional worker to rural communities adjacent to the larger peripheral urban areas (such as Halifax, Moncton and Regina).

In sum, however, the service sectors which are increasingly concentrated in peripheral areas fall into two categories: low order services and public sector employment.

4.4 Decomposition of growth rates into constituent parts

Before concluding this section, the results of an analysis which decomposes employment growth rates of the 12 synthetic regions will be presented (table 4). This analysis has been conducted on the basis of the 18 sectors classification of economic activity described above, and is very similar to shift-share analysis.

The aim of the analysis is to answer the following question: to what extent is employment growth in a given SR attributable to industrial structure? In order to do this, growth in total employment is disaggregated in the following way:

$$G_a = g_c \sum_{i=1}^{18} e_i \; + \left[\left(\sum_{i=1}^{18} e_i g_{ci} \right) - g_c \sum_{i=1}^{18} e_i \right] + R_a$$

where:

G_a = total employment growth in synthetic region *a* over period of study
g_c = % employment growth Canada over period of study
e_i = employment in sector *i* in synthetic region *a* at the beginning of the period
g_{ci} = % employment growth in sector *i* in Canada over period of study
R_a = residual employment growth in synthetic region a, or local growth.

If the equation is divided through by employment in region *a* at the beginning of the period ($\sum_{i=1}^{18} e_i$) then it can be expressed in terms of growth rates:

$$g_a = g_c + g_s + g_r$$

where:

g_a = % employment growth in the synthetic region *a* over period of study
g_c = national component (% employment growth Canada over period of study)
g_s = sectoral component (% employment growth in region had all sectors grown at national rate)

g_r = residual component (% employment growth explained neither by national growth or by sectoral growth).

Table 4 presents the growth rates for the sectoral components, g_s , for the local component, g_r, and for total growth, g_a , for the periods 1971 to 1981, and 1981 to 1996. If g_s is positive it indicates that, given the SR's industrial structure at the beginning of the period and the subsequent growth rates in each sector, employment in the SR could be expected to grow faster than the growth rate of the Canadian economy. If g_r is positive, it indicates that the SR's actual growth over the period was faster than its initial sectoral mix would have led one to expect.

Table 4: Decomposition of growth rate, 18 sectors, 1971 to 1981 and 1981 to 1996

	g_s, sectoral component		g_r , local component		g_a , actual growth	
	71 to 81	81 to 96	71 to 81	81 to 96	71 to 81	81 to 96
AM1	-3,1%	-0,3%	-3,9%	0,5%	41,7%	25,9%
AM2	-2,2%	-0,3%	23,2%	-6,4%	69,6%	19,1%
AC1	-5,4%	-4,3%	-8,1%	3,3%	35,2%	24,7%
AC2	-5,9%	-5,4%	1,4%	6,6%	44,2%	26,9%
AC3	-5,9%	-6,3%	-9,9%	-8,0%	33,0%	11,4%
AC4	-6,1%	-7,3%	-5,3%	-1,7%	37,3%	16,8%
RC	-3,0%	-10,4%	7,9%	12,9%	53,7%	28,3%
AP1	-2,7%	-1,6%	-5,2%	-2,8%	40,8%	21,4%
AP2	-4,7%	-4,7%	5,6%	-4,3%	49,6%	16,7%
AP3	-2,9%	-5,1%	11,3%	-2,3%	57,1%	18,3%
AP4	-2,8%	-5,3%	-4,6%	-13,1%	41,3%	7,4%
RP	-1,7%	-10,7%	-3,6%	-1,9%	43,5%	13,2%

The negative values of g_s over both periods are evidence of the economic restructuring that has occurred. Sectors which were prevalent in 1971 (such as LVA manufacturing) have tended to grow slowly or decline, and new sectors, largely absent from the sectoral mix in the earlier years (such as high order services) have grown. It is therefore interesting to see that metropolitan areas have a near zero value of g_s over the latter period, indicating that, by 1981, their industrial structure was more conducive to growth than that of most other SRs. Only the largest peripheral urban areas – the regional metropoli – have a value close to that of metropolitan areas.

It is also striking that between 1981 and 1996 rural areas, both central and peripheral, have the initial sectoral structure least conducive to growth. This stands in contrast to the 1970s when the rural sectoral mix was relatively good.

A final point to note regarding the sectoral component is that for the 1981 to 1996 period it declines monotonically with urban size: in other words, the larger the city the more conducive to growth the initial industrial structure.

The local component, g_a, does not vary monotonically with size. However, over the 1981 to 1996 period *not one* peripheral SR has a positive local component, whereas large metropolitan areas and the largest central urban areas all do. The highest positive local component is observed for central rural areas: this is evidence that over the later 15 years the process of metropolisation has been under way and has affected not only metropolitan areas but also nearby rural ones.

The results of this analysis confirm results of the previous sections where it has been seen that many individual sectors grew faster in central areas and in larger cities. Conversely, peripheral areas, particularly small towns and rural areas, are least likely to have benefited from their economic structure or from positive "other" factors captured – but not identified – by the local component. It should be noted that this picture becomes clear over the 1981 to 1996 period. Between 1971 and 1981 the sectoral component of most peripheral SRs is greater than that for the central ones and some peripheral SRs benefit from positive local components, reflecting the fast growth in primary sector employment over the period.

4.5 Conclusion

Whether sectors are analysed individually or together, and whether growth rates or concentration are looked at, a rather bleak picture emerges for peripheral areas. The sectors on which they are most reliant tend to be in decline, and the sectors which appear to be performing better – retail and various other low-order services – are those which remain to service local populations as economic activity moves towards central and metropolitan areas.

It should be emphasised that the larger peripheral urban areas perform better than their hinterland in a wider variety of sectors, and nothing in the results above suggests that there do not exist some very successful regions located in the periphery. However, in general, proximity to a large metropolitan area and agglomeration economies (urban size) seem to play a key and enduring role in attracting employment, a role which has strengthened over 1981 to 1996.

This trend is not necessarily unidirectional and can fluctuate: there is evidence – not presented here – that the 1991 to 1996 period was somewhat less stark for peripheral areas, since the brunt of the recession was borne by metropolitan areas. However, growth over 1996 to 2001 has again tended to be in and around metropolitan areas. The patterns presented in this section correspond, in our opinion, to the underlying long term trends, around which fluctuations can and do occur.

Figure 3a: Concentration of primary sector employment in SRs, 1971 and 1996,

(location quotients)

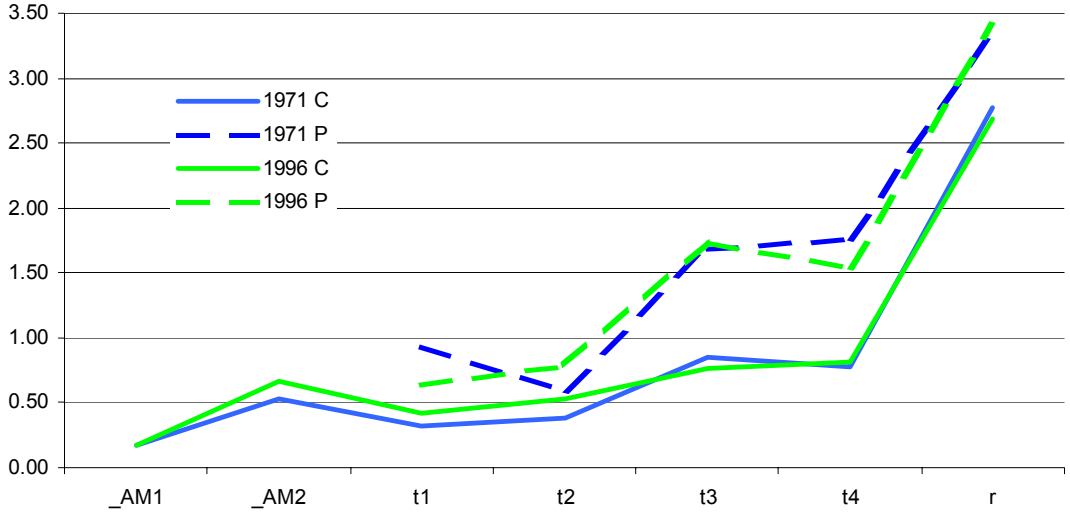


Figure 3b: Primary sector employment growth, 1971-1996

index=100 for 1971

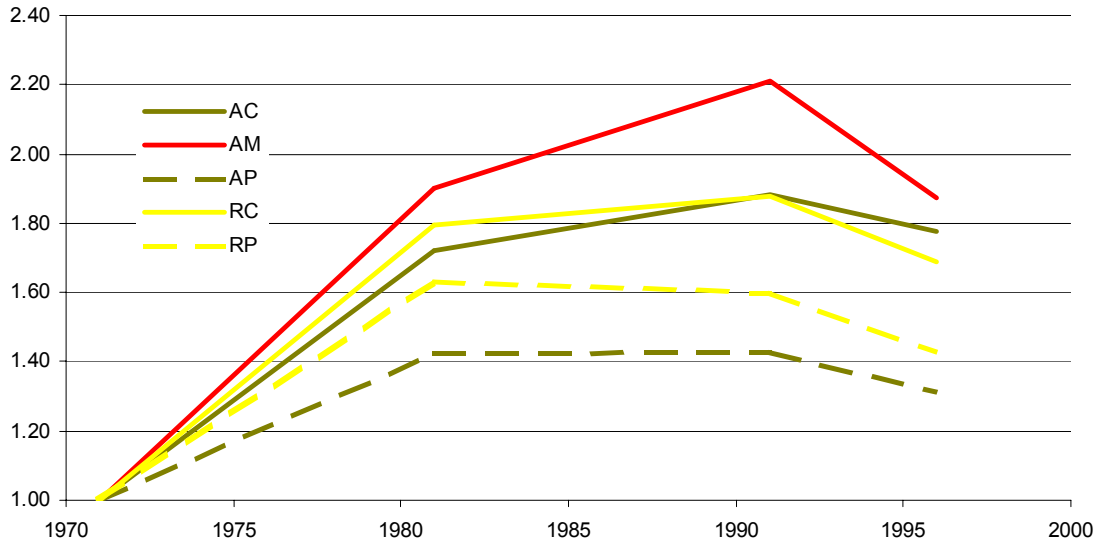


Figure 4a: Concentration of Low value added manufacturing and utilities employment in SRs, 1971 and 1996

(location quotients)

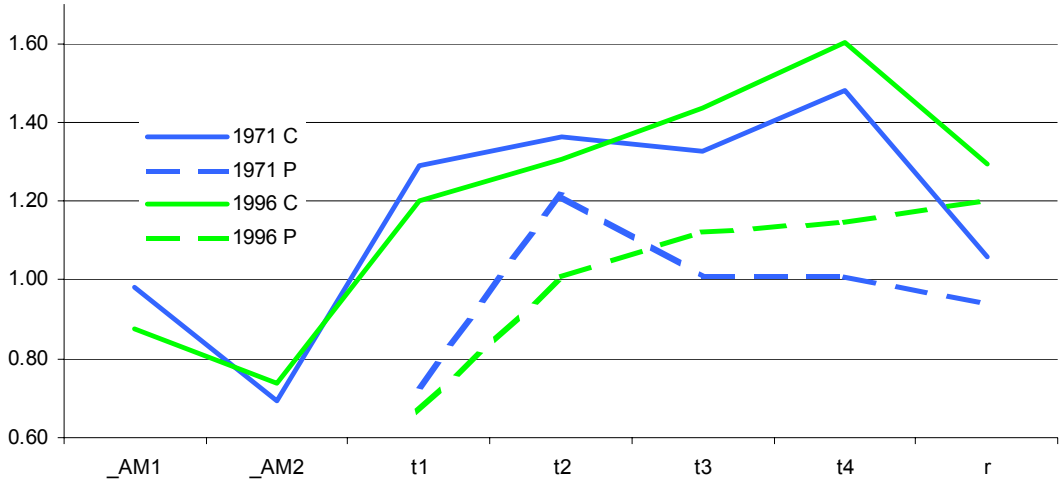


Figure 4b: Low value added manufacturing and utilities sector employment growth, 1971-1996

index=100 for 1971

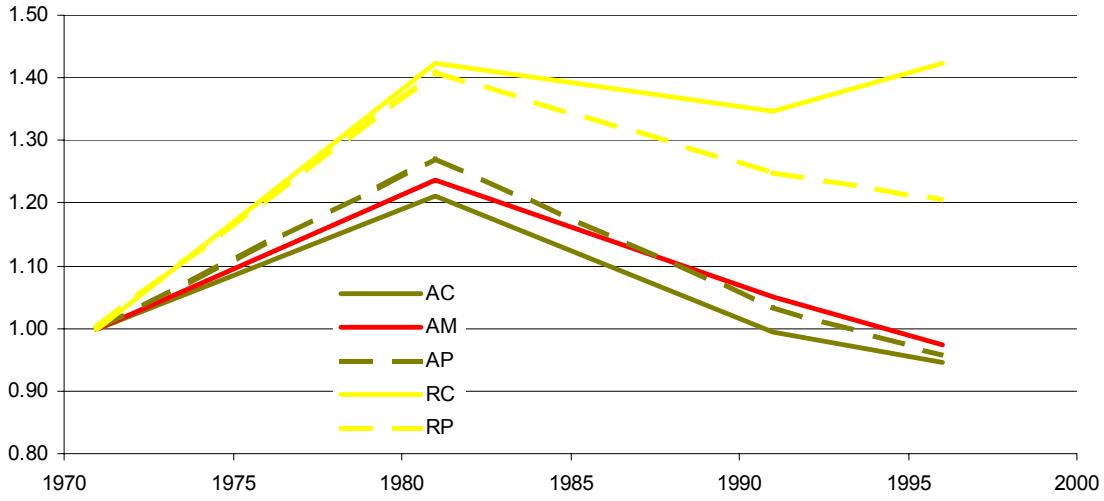


Figure 5a: Concentration of medium value added manufacturing employment in SRs, 1971 and 1996
(location quotients)

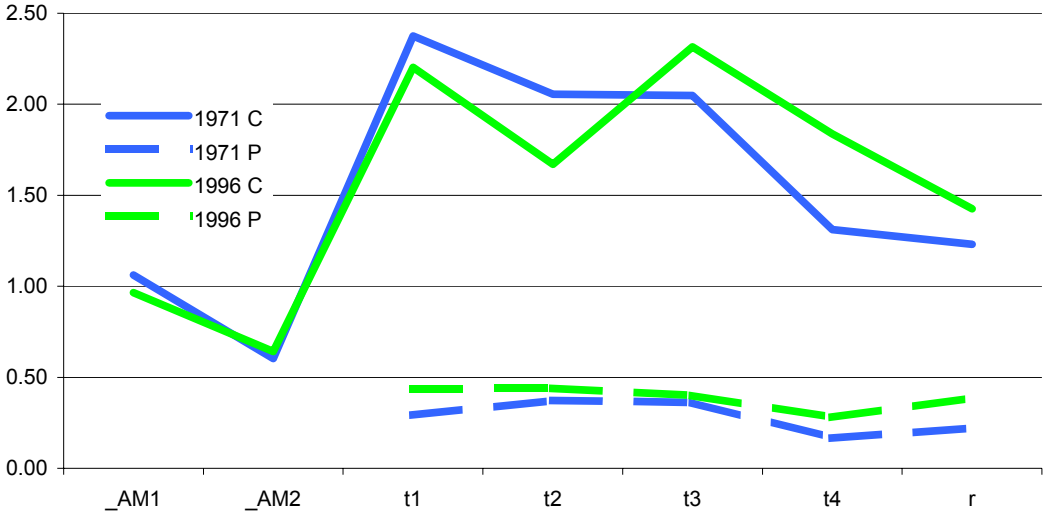


Figure 5b: Medium value added manufacturing sector employment growth, 1971-1996
index=100 for 1971

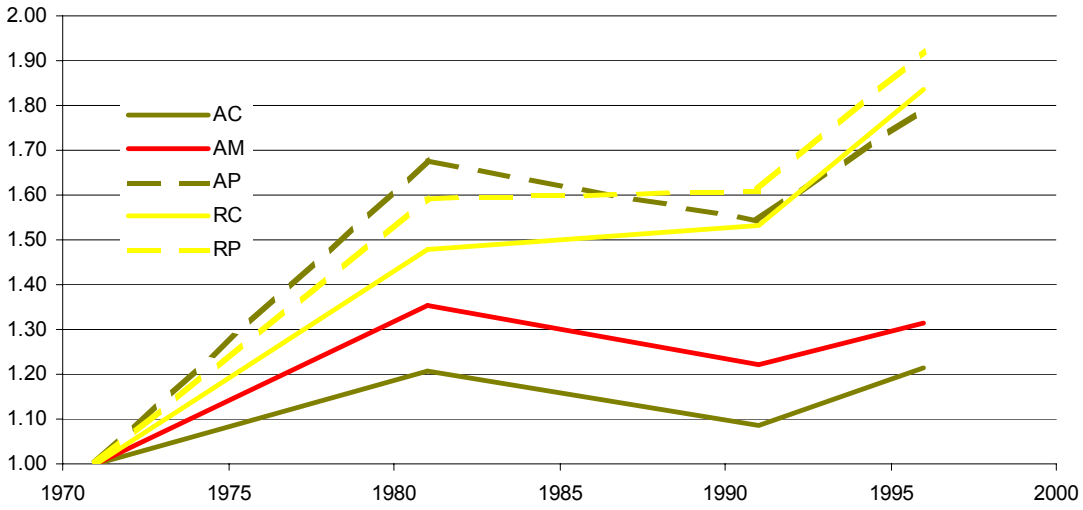


Figure 6a: Concentration of High value added manufacturing employment in SRs, 1971 and 1996
(location quotients)

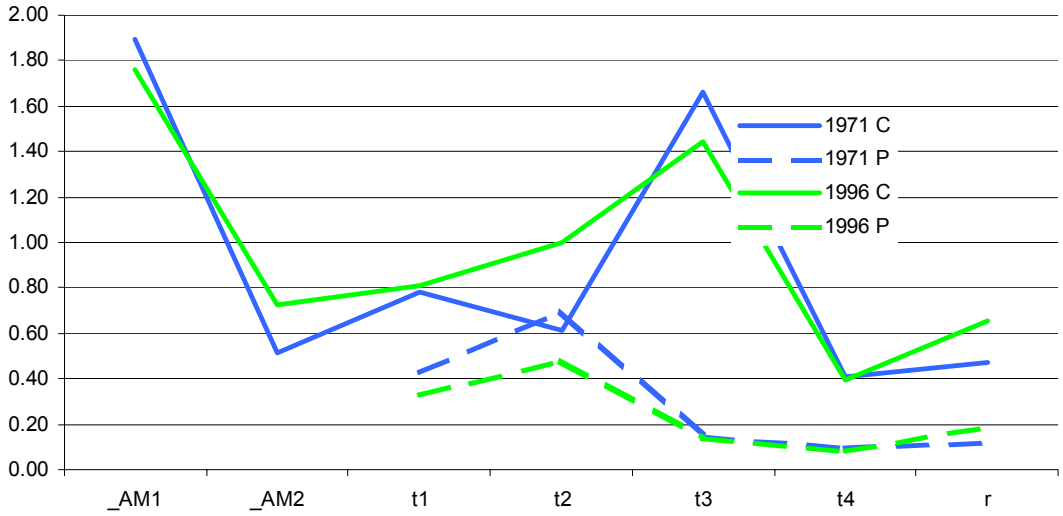


Figure 6b: High value added manufacturing sector employment growth, 1971-1996
index=100 for 1971

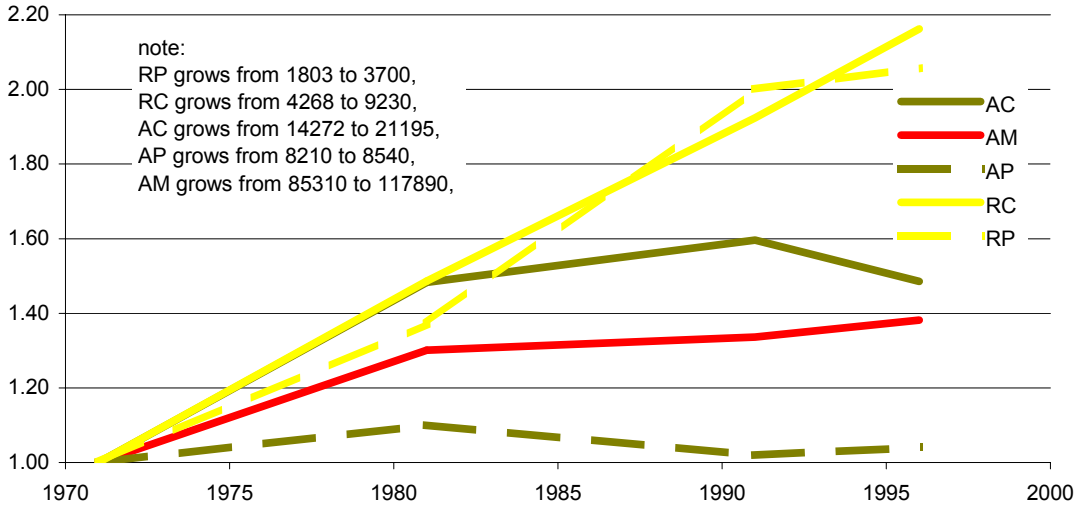


Figure 7a: Concentration of wholesale employment in SRs, 1971 and 1996
(location quotients)

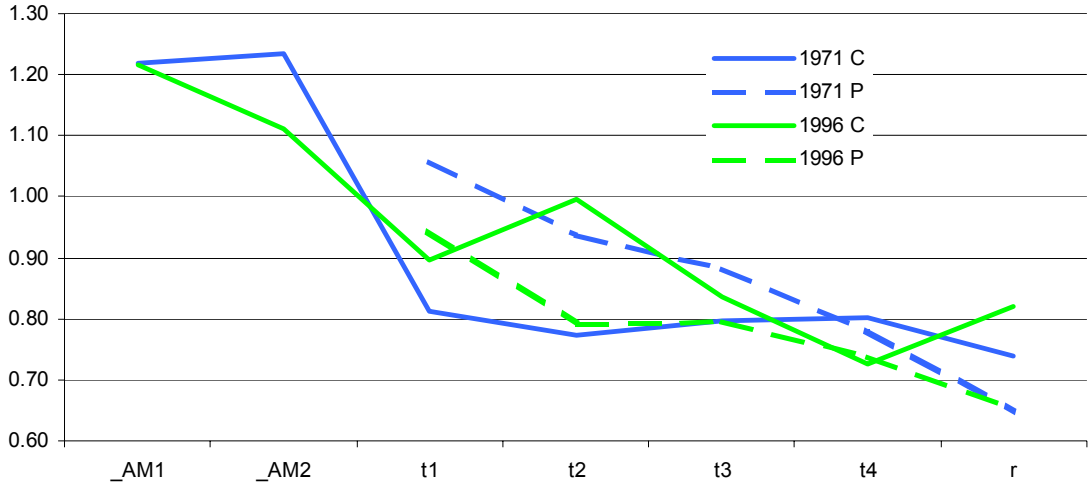


Figure 7b: Wholesale employment growth, 1971 to 1996
index=100 for 1971

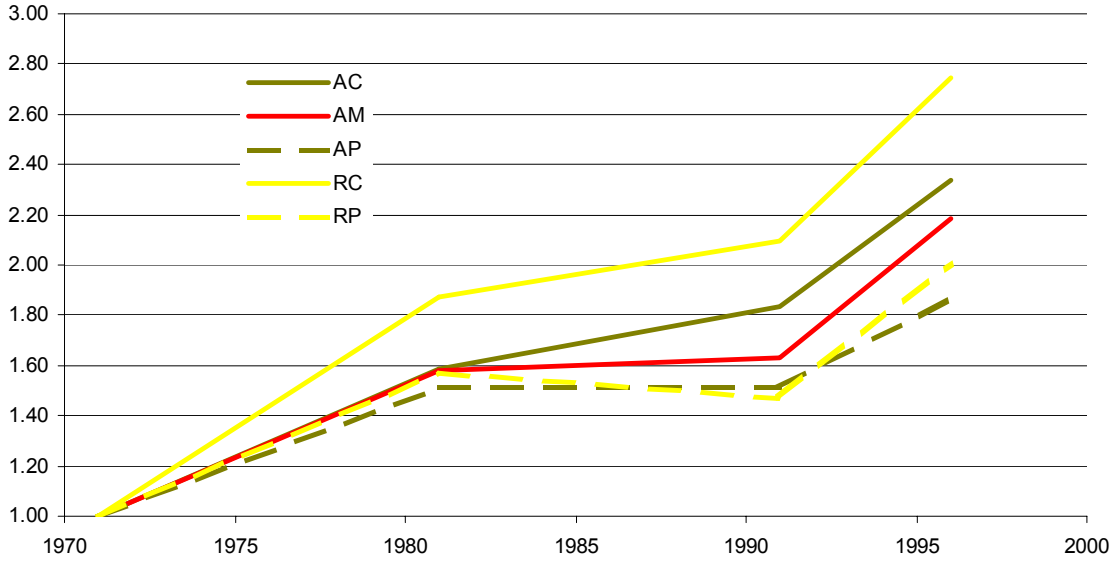


Figure 8a: Concentration of hotel, short-term accommodation, restaurants and camp sites employment in SRs, 1971 and 1996
(location quotients)

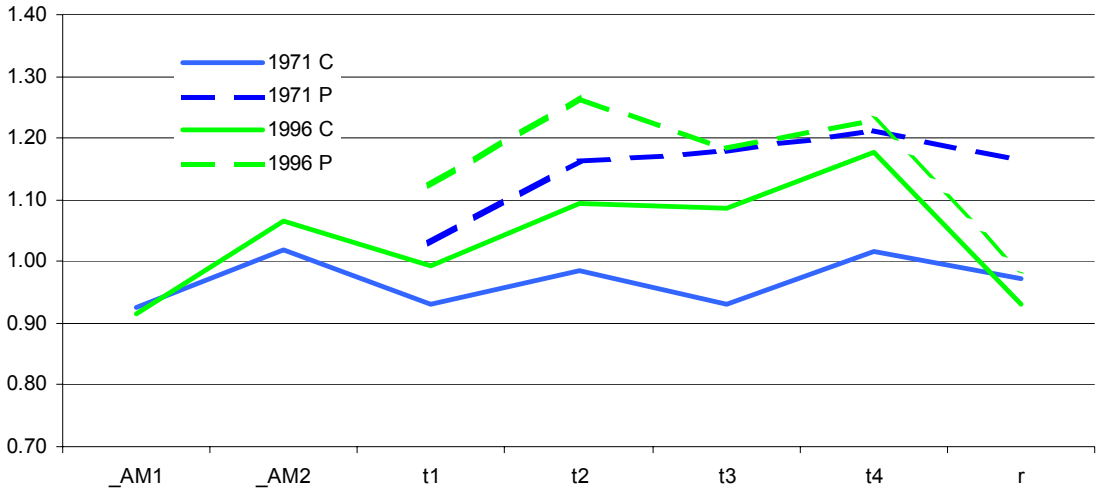


Figure 8b: Hotels, short-term accommodation, restaurants and camp sites employment growth, 1971 to 1996
index=100 for 1971

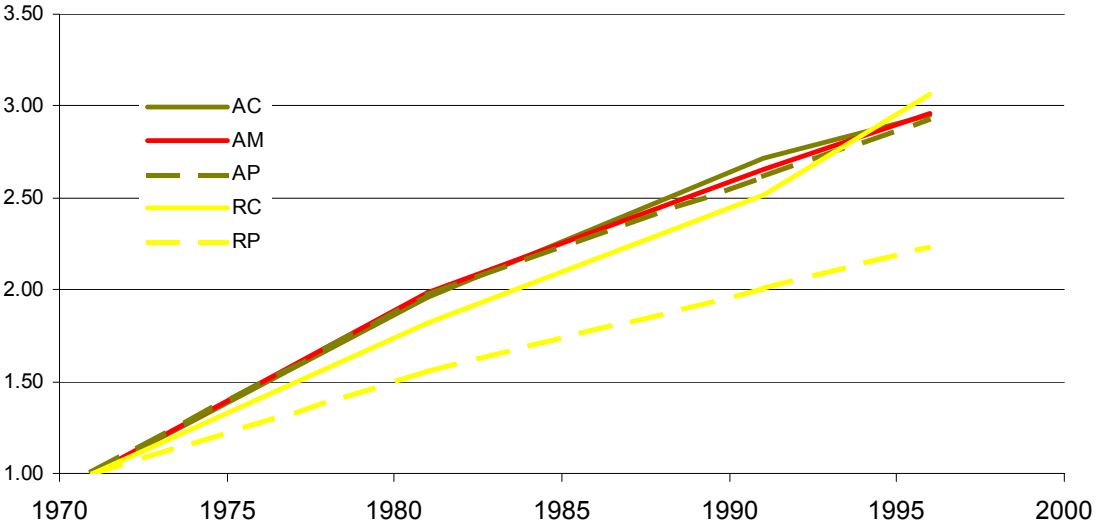


Figure 9a: Concentration of high tech producer service employment in SRs, 1971 and 1996
(location quotients)

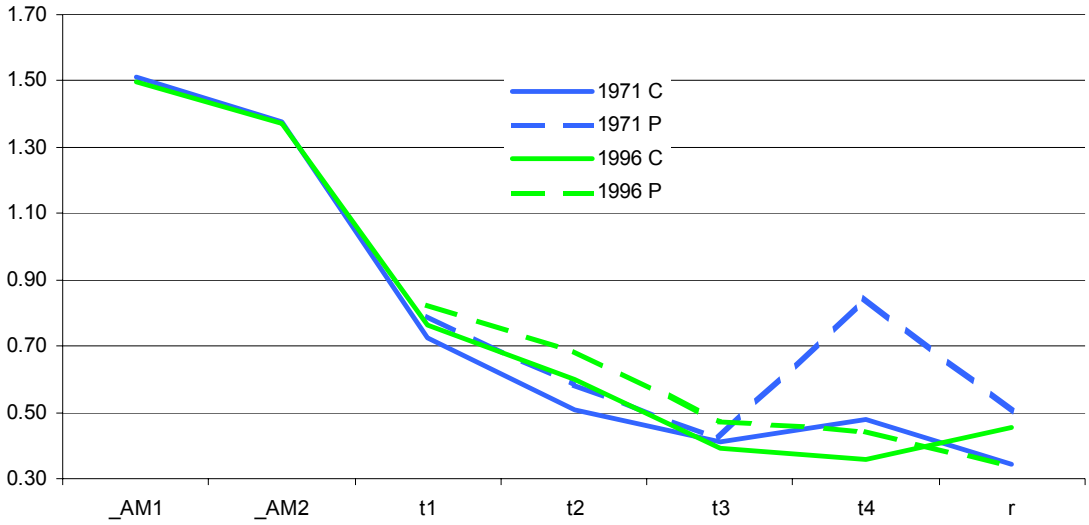


Figure 9b: High tech producer services employment growth, 1971 to 1996
index=100 for 1971

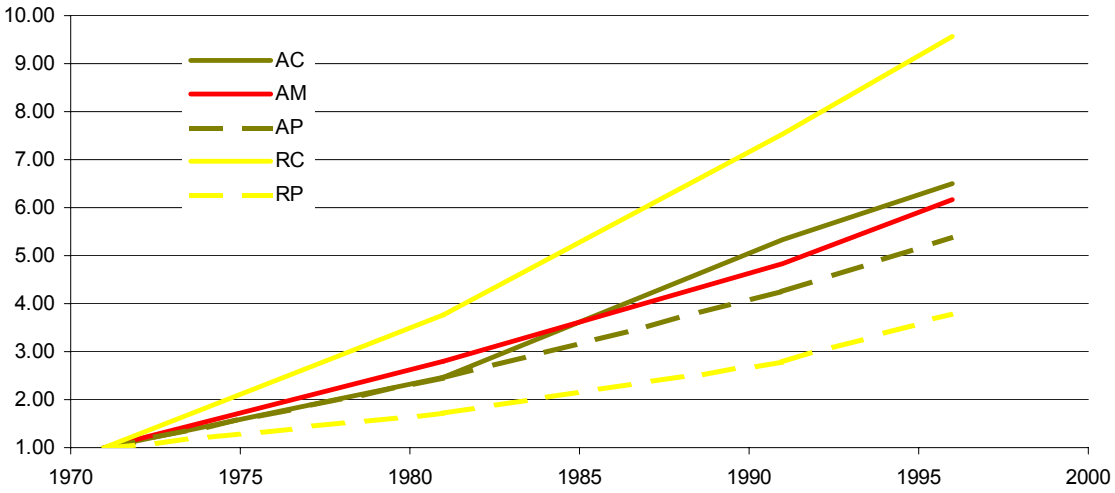


Table 3a: Location quotients in SRs, 18 sectors, 1971 and 1996

(first part)

		_AM1	_AM2	t1	t2	t3	t4	r
primary	1971 C	0.17	0.53	0.32	0.38	0.85	0.78	2.77
	1971 P			0.94	0.59	1.69	1.77	3.33
	1996 C	0.18	0.67	0.43	0.53	0.76	0.82	2.69
	1996 P			0.65	0.79	1.73	1.54	3.40
Low value added and utilities	1971 C	0.98	0.70	1.29	1.36	1.33	1.48	1.06
	1971 P			0.73	1.21	1.01	1.01	0.94
	1996 C	0.88	0.74	1.20	1.31	1.44	1.60	1.29
	1996 P			0.66	1.01	1.12	1.15	1.20
Medium value adde	1971 C	1.06	0.60	2.37	2.06	2.05	1.31	1.23
	1971 P			0.29	0.37	0.36	0.16	0.22
	1996 C	0.96	0.64	2.20	1.67	2.32	1.84	1.43
	1996 P			0.44	0.44	0.40	0.28	0.39
High value added	1971 C	1.89	0.52	0.78	0.62	1.66	0.41	0.48
	1971 P			0.43	0.70	0.15	0.10	0.12
	1996 C	1.76	0.72	0.81	1.00	1.44	0.39	0.65
	1996 P			0.33	0.48	0.14	0.09	0.19
construction	1971 C	0.92	1.10	0.95	0.92	0.80	0.93	1.15
	1971 P			1.01	1.05	1.08	0.99	1.14
	1996 C	0.89	1.04	0.98	0.97	0.91	1.00	1.17
	1996 P			1.04	1.14	1.15	1.02	1.11
transport	1971 C	1.06	1.14	0.64	0.57	0.67	0.55	0.87
	1971 P			1.19	1.13	1.05	1.10	1.13
	1996 C	0.96	1.19	0.76	0.86	0.76	0.81	1.16
	1996 P			1.01	0.99	0.89	1.10	1.12
communication, publishing, printing	1971 C	1.32	1.12	0.77	0.82	0.63	0.74	0.55
	1971 P			1.01	0.95	1.00	0.83	0.60
	1996 C	1.32	1.10	0.84	0.81	0.65	0.76	0.63
	1996 P			1.09	0.86	0.83	0.73	0.50
High tech services	1971 C	1.51	1.37	0.72	0.51	0.41	0.48	0.34
	1971 P			0.79	0.59	0.42	0.84	0.50
	1996 C	1.50	1.37	0.76	0.60	0.39	0.36	0.46
	1996 P			0.83	0.69	0.47	0.44	0.34
wholesale	1971 C	1.22	1.23	0.81	0.77	0.80	0.80	0.74
	1971 P			1.06	0.94	0.88	0.78	0.65
	1996 C	1.22	1.11	0.90	1.00	0.84	0.73	0.82
	1996 P			0.94	0.79	0.80	0.74	0.65

Table 3a: Location quotients in SRs, 18 sectors, 1971 and 1996

(second part)

		_AM1	_AM2	t1	t2	t3	t4	r
retail	1971 C	0.99	1.06	0.99	1.07	1.04	1.09	0.89
	1971 P			1.11	1.10	1.12	1.06	0.91
	1996 C	0.94	1.00	1.01	1.13	1.12	1.14	0.94
	1996 P			1.08	1.20	1.18	1.16	0.96
personal and other services	1971 C	1.16	1.11	0.94	0.93	0.84	0.83	0.77
	1971 P			1.08	0.90	0.89	0.77	0.71
	1996 C	1.18	1.08	0.96	0.95	0.82	0.81	0.76
	1996 P			1.00	0.92	0.88	0.81	0.70
hotels, restaurants, camp sites etc…	1971 C	0.92	1.02	0.93	0.99	0.93	1.02	0.97
	1971 P			1.03	1.16	1.18	1.21	1.16
	1996 C	0.91	1.06	0.99	1.09	1.09	1.18	0.93
	1996 P			1.12	1.27	1.18	1.23	0.99
entertainment	1971 C	1.03	1.10	1.02	1.01	1.08	0.93	1.00
	1971 P			0.92	0.84	0.94	0.90	0.91
	1996 C	1.12	1.06	1.02	0.96	0.97	0.89	0.82
	1996 P			1.05	0.94	0.87	0.77	0.73
Finance, Insurance, Real Estate	1971 C	1.41	1.12	0.94	0.75	0.60	0.68	0.55
	1971 P			0.93	0.72	0.66	0.63	0.43
	1996 C	1.33	1.07	0.98	0.78	0.70	0.70	0.63
	1996 P			0.95	0.74	0.72	0.68	0.53
professions (law, accounting, marketing	1971 C	1.47	1.06	0.90	0.77	0.73	0.85	0.45
	1971 P			0.85	0.83	0.76	0.67	0.35
	1996 C	1.41	1.06	0.86	0.79	0.72	0.73	0.58
	1996 P			0.88	0.80	0.70	0.77	0.44
education	1971 C	0.91	1.10	1.13	1.07	0.92	0.96	0.96
	1971 P			1.09	1.05	1.01	1.00	1.03
	1996 C	0.90	1.02	1.10	1.08	1.04	1.13	0.90
	1996 P			1.16	1.13	1.12	1.12	1.08
health and social serv	1971 C	0.94	1.18	1.11	1.09	1.45	1.24	0.71
	1971 P			1.28	1.05	1.11	1.35	0.74
	1996 C	0.98	1.04	1.12	1.02	1.16	1.01	0.75
	1996 P			1.25	1.07	1.09	1.17	0.84
public administration	1971 C	0.97	1.38	0.63	0.84	0.54	0.71	0.73
	1971 P			1.53	1.37	1.00	1.16	0.96
	1996 C	0.95	1.20	0.73	0.84	0.61	0.65	0.72
	1996 P			1.61	1.43	1.00	1.31	1.03

Table 3b: Growth index in aggregated SRs, 1971=1, 1971 and 1996
(first part)

		AM	AC	AP	RC	RP
primary	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.90	1.72	1.43	1.79	1.63
	1991	2.21	1.88	1.43	1.88	1.60
	1996	1.88	1.78	1.31	1.69	1.43
		AM	AC	AP	RC	RP
Low value added and utilities	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.24	1.21	1.27	1.42	1.41
	1991	1.05	0.99	1.04	1.35	1.25
	1996	0.97	0.95	0.96	1.42	1.21
		AM	AC	AP	RC	RP
Medium value added	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.35	1.21	1.68	1.48	1.59
	1991	1.22	1.08	1.54	1.53	1.61
	1996	1.31	1.22	1.79	1.84	1.92
		AM	AC	AP	RC	RP
High value added	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.30	1.48	1.10	1.49	1.37
	1991	1.34	1.60	1.02	1.92	2.00
	1996	1.38	1.49	1.04	2.16	2.06
		AM	AC	AP	RC	RP
construction	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.41	1.27	1.42	1.44	1.29
	1991	1.57	1.64	1.43	1.77	1.25
	1996	1.38	1.39	1.40	1.59	1.24
		AM	AC	AP	RC	RP
transport	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.36	1.30	1.22	1.44	1.19
	1991	1.43	1.54	1.20	1.81	1.25
	1996	1.32	1.62	1.15	2.04	1.26
		AM	AC	AP	RC	RP
communication, publishing, printing	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.44	1.42	1.43	1.63	1.26
	1991	1.63	1.67	1.53	2.02	1.29
	1996	1.78	1.78	1.63	2.25	1.37
		AM	AC	AP	RC	RP
High tech services	1971	1.00	1.00	1.00	1.00	1.00
	1981	2.79	2.46	2.45	3.78	1.73
	1991	4.82	5.32	4.27	7.54	2.80
	1996	6.17	6.49	5.40	9.56	3.80
		AM	AC	AP	RC	RP
wholesale	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.58	1.59	1.51	1.88	1.57
	1991	1.63	1.84	1.51	2.10	1.47
	1996	2.18	2.34	1.86	2.75	2.01

Table 3b: Growth index in aggregated SRs, 1971=1, 1971 and 1996
(second part)

		AM	AC	AP	RC	RP
retail	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.49	1.46	1.53	1.57	1.43
	1991	1.81	1.84	1.76	2.08	1.69
	1996	1.83	1.83	1.83	2.21	1.81
		AM	AC	AP	RC	RP
personal and other services	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.64	1.52	1.54	1.46	1.33
	1991	2.37	2.22	2.21	2.32	1.99
	1996	2.65	2.48	2.39	2.85	2.28
		AM	AC	AP	RC	RP
hotels, restaurants, camp sites etc…	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.98	1.96	1.97	1.82	1.56
	1991	2.66	2.72	2.62	2.51	2.01
	1996	2.96	2.95	2.93	3.07	2.24
		AM	AC	AP	RC	RP
entertainment	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.59	1.54	1.52	1.53	1.28
	1991	2.21	1.81	2.01	2.13	1.58
	1996	3.20	2.75	2.90	2.73	2.15
		AM	AC	AP	RC	RP
Finance, Insurance, Real Estate	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.69	1.61	1.85	1.99	1.88
	1991	2.14	2.20	2.10	2.65	2.26
	1996	2.08	2.15	2.15	2.81	2.43
		AM	AC	AP	RC	RP
professions (law, accounting, marketing)	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.87	1.68	2.01	2.13	2.10
	1991	3.07	2.78	2.79	4.03	2.92
	1996	3.32	3.08	3.27	4.86	3.85
		AM	AC	AP	RC	RP
education	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.48	1.41	1.54	1.54	1.48
	1991	2.01	1.90	2.04	2.07	1.87
	1996	2.27	2.15	2.33	2.38	2.14
		AM	AC	AP	RC	RP
health and social service	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.48	1.32	1.39	1.48	1.42
	1991	2.01	1.76	1.77	2.13	1.87
	1996	2.07	1.82	1.84	2.40	2.08
		AM	AC	AP	RC	RP
public administration	1971	1.00	1.00	1.00	1.00	1.00
	1981	1.38	1.30	1.32	1.42	1.28
	1991	1.64	1.81	1.59	1.78	1.60
	1996	1.30	1.39	1.34	1.46	1.28

5- Geographic trends: socio-economic indicators

The data which we have obtained cover a vast array of socio-economic indicators. It has thus been necessary to choose a few key variables which illustrate some important aspects of socio-economic variation across Canadian territory. The variables chosen fall into four categories:

- demography and population

- jobs and population

- income

- education

The first set of variables succinctly illustrates the age profile over Canadian synthetic regions (SRs) and the evolution of total population (already mentioned in section 2).

The second set documents the ratio of income earners to working age population. This ratio - also known as the labour force participation rate - is more precise than percentage unemployed in that it is not subject to changing definitions and does not depend upon individual choices relating to workforce participation. The ratio provides an indication of whether the population is underemployed.

The third set examine three different types of income: earned income per worker, earned income per capita, total income per capita. The first is a rough indicator of wage levels, the second is an indicator of the region's level of 'economic' income, and the last is a rough estimate of standard of living[5].

Finally, various indicators of education level are examined.

No collection of indicators can provide a full regional socio-economic profile, and it is self evident that these statistics are limited in many ways. However, they are strictly comparable across time and space, and enable comparisons to be made

[5] Sen (1999) describes the limitations inherent in taking any one indicator as an indicator of standard of living. He does, however, point out the strong connection between income and other indicators. It should be noted that in this study no account is taken of different costs of living across the territory.

across the entire Canadian territory: it is the relative values of these indicators that are of most interest.

5.1 Demography and population

- *Population*

Figure 10 displays in graphic form, and by way of a population index, the information in table 2. It can be seen that in terms of population growth peripheral rural areas have been lagging all other SRs since 1971, and that the smallest peripheral rural areas, AP4, have similar slow growth over the entire period. Only small central urban areas, AC3, have grown at rates approaching these two rural SRs, all other SRs displaying substantially faster growth. It was noted at the end of section 4 that the 1991-1996 period was slightly less stark for peripheral areas: figure 1 shows that after a decade of stagnation (and even decline in the rural periphery), modest growth was recorded in AP4 and RP. Whilst this is encouraging, the remainder of the figure emphasises that growth was also recorded in all other SRs over the 1991-1996 period, with the highest absolute growth in the largest agglomerations, AM1. Table a4.1 in annex 4 is also worth commenting upon, since it shows that net migration from peripheral regions in Quebec slowed over the 1991 to 1996 period but accelerated in 1997, as soon as employment began to pick up in metropolitan areas. Thus, the slightly better performance of peripheral areas between 1991 and 1996 may be due to decreased opportunities in metropolitan areas - in which case the metropolisation scenario is further reinforced by the 1991 to 1996 figures.

Whatever the short term fluctuations in rates of migration and population growth, the long term trends for the regions of Quebec are unambiguous. Table a4.2 (in annex 4) displays the latest projections published by the *Institut de la Statistique du Quebec*: it is clear that the trends which we have identified for the 1981 to 1996 period are not expected to halt. At best - and in the long term - population in these areas may stabilise at a level substantially below the highest levels attained.

- Population under 15 years of age

The second half of the baby-boom generation was under 15 years old in 1971, as illustrated by the country-wide drop in the percentage of the population below the age of 15 between 1971 and 1981 (figure 11). Since 1981 there has been a slow decline in the percentage of young people across all SRs, central and peripheral, irrespective of urban size. Two features of the figure are worth emphasising:

- whereas in 1971 peripheral areas systematically had more young people than central areas, by 1996 the percentage of young people is similar. In other words, the decline in the percentage of young people has been faster in peripheral areas. In addition, whereas the decline has continued over the 1991-1996 period in peripheral areas, there are signs that it is slowing in central areas, and has ceased in the largest metropolitan (and certain central urban) areas.

- whereas in central areas there is no clear relationship between urban size and the percentage of young people, in peripheral areas there is a systematic tendency for there to be more young people the smaller the urban area.

- Population over 65 years of age

At the other end of the population scale, population aging is an issue currently of concern to policy makers. Figure 12 illustrates this process, with the percentage of people over the age of 65 rising systematically over the period of study in all SRs.

The distribution of elderly people across SRs displays regularities both in peripheral and in central areas. Metropolitan areas have the smallest percentage of elderly people. In central areas, the percentage of elderly people rises as one moves to smaller urban areas, and is highest in central rural areas. Rural areas close to metropolitan areas appear to be attractive retirement locations.

The relationship is different in peripheral areas. Here the proportion of elderly people, lower in general than the proportion in central areas, declines the smaller

the urban area. As in central areas, it is highest in rural SRs: here too rural areas appear to be attractive retirement locations, but peripheral rural areas, despite this apparent attraction, have a substantially lower proportion of elderly people than central rural areas. Over the 1971 to 1996 period growth in the proportion of elderly people has been more marked in the non-metropolitan SRs.

- Population of 25 to 54 years of age

This age group constitutes the prime working age population. There are substantially higher proportions of people of this age-group in metropolitan areas: since these areas are the most populated SRs (table 2), metropolitan areas benefit from the presence of large absolute - as well as relative - numbers of working age people . There is a tendency in both central and peripheral areas for the proportion of prime working age people to decline with urban size, though the largest central areas (AC1) have substantially lower proportions than all other central or peripheral areas except for the rural periphery.

It is important to emphasise that the rural periphery has had, since 1971, the lowest proportion of 25 to 54 year olds, though the difference between it and central rural areas is decreasing.

A final, more general point can be made: between 1991 and 1996 the proportion of prime working age people increased at a rate far slower than between 1981 and 1991 or 1971 and 1981. Since there are fewer 15 to 24 year olds in 1996 than there were in 1991 (graph not shown), then it is to be expected that the proportion of prime working age people will begin to decline in the near future. The lack of working age people will not only be of concern to peripheral regions, but indeed to the entire economy.

- Ratio of dependents (0 to 14 and over 65 year olds) to total population

Another way of looking at the same data is to calculate the percentage of the total population not of working age: the higher this percentage, the smaller the working age population. In figure 14 it can be seen that the percentage of dependent people has decreased across all SRs, especially over the first

decade. Since 1981 the percentage has approximately stabilised, but whereas in the largest central urban areas (AM1, AM2, AC1, AC2) there is a tendency for the percentage to rise over the last five years, the decline has continued in both types of rural area and in all peripheral urban areas. In these areas, the decline in the proportion of young people has been faster than the rise in the proportion of elderly.

Notwithstanding these trends, it is the largest metropolitan areas which have the least dependents, and rural areas which have the most (except in 1996 when the smallest central urban areas reach the same percentage as rural areas). On the whole, the larger the urban area the lower the percentage of dependents, a natural corollary to their higher proportion of working age population.

5.2 Jobs and population

In this section only one variable will be discussed: the labour force participation rate. This is calculated as the percentage of working age people (15 to 64 years) who had an earned income in the census year. It therefore conflates all types of employment - seasonal, full-time, part-time - and should be interpreted accordingly. It remains, in our opinion, one of the best indicators of employment activity which we can construct, since its definition is stable over the 25 years of study and is not dependent on personal decisions. This is in contrast to the rate of unemployment, the definition of which can vary and which, even given a stable definition, is dependent on other factors.

Labour force participation rates, after rising between 1971 and 1991, declined in all SRs over the 1991 to 1996 period (figure 15). The rise can be attributed to a large extent to the increased feminisation of the workforce, and it is therefore not surprising that the SRs with the fastest rise in feminisation (particularly rural areas) also witnessed the fastest rise in labour force participation rates. This being so, it is worth noting that peripheral rural areas have, with medium sized central urban areas (AC3), the lowest labour force participation rates (73%).

There is not, however, a clear relationship between labour force participation rates and synthetic regions. Whereas the largest metropolitan areas have low

labour force participation rates (74%), the smaller metro areas have the highest (79%). Central and peripheral urban areas, as well as central rural areas, all have similar labour force participation rates of around 75% to 77%.

One feature of note is the fact that labour force participation rates in the largest metropolitan areas began to decline sooner than in all other SRs. Indeed, the only SR for which labour force participation rates declined over the 1980's is AM1, and the decline has been precipitous: from the highest labour force participation rates in 1981 (83%), the rate in metropolitan areas is now close to the lowest. Since the workforce in large metro areas was already highly feminised in 1981, these areas did not benefit from much of a boost in subsequent years. This, however, does not explain the dramatic decline. A possible explanation is migration towards metropolitan areas which may have increased in the 1980's as employment prospects in peripheral areas worsened (see section 2). It should be noted that if this indicator is construed as a partial measure of economic distress, then a case can be made that large metropolitan areas are amongst the worst off SRs in this respect. In policy terms this may mean that metropolitan areas, despite their strong employment performance, also require attention.

In sum, despite the concentration of economic activity (employment) in and around metropolitan areas, economic distress (insofar as it is related to this variable) has not been alleviated.

Map 5a shows the distribution across Canada of labour force participation rates in 1996. Peripheral areas in eastern Canada (i.e. Northern Ontario, most peripheral areas in Quebec, Northern New Brunswick, and most of Newfoundland) have low labour force participation rates. Surprisingly, despite similar levels of job loss over the period of analysis (see section 2), Manitoba and Saskatchewan have remarkably high labour force participation rates. To a lesser extent this can be noted in PEI, parts of Southern New Brunswick and in Nova Scotia: here too, high levels of job loss have not led to low labour force participation rates.

Thus, the lack of a clear relationship between labour force participation rates and synthetic regions is due in part to the fact that there exist marked differences across the provinces: labour force participation rates appear to be very low in Quebec's outlying regions and high in many other peripheral regions which have suffered similar job losses. A tentative hypothesis explaining this is the possible lower mobility of Quebec, Acadian and Newfoundland populations: it is principally in Quebec, Northern New Brunswick and Newfoundland that labour force participation rates are consistently low.

Map 5b shows the change in labour force participation rates over the 1981 to 1996. No simple pattern is evident, although this is not unexpected since participation rates are dependent upon the rate of feminisation (which occurred far more massively in rural areas) and upon the growth rate differential between jobs and working age population. Thus, whilst some peripheral areas have seen a drop in labour force participation rates (notably Gaspé, Newfoundland, the Acadian peninsula), many peripheral areas have seen an increase. This is most particularly true in southern Saskatchewan. In a context of rapid feminisation of the workforce in peripheral areas, the decline noted in the three eastern rural regions is of particular relevance.

5.3 Income

There is no evidence that earned incomes are systematically lower in peripheral regions. It is undeniable that earned income is highest in the largest metropolitan areas (table 5) and that earned incomes tend to be lowest in rural peripheral areas. However in peripheral urban areas of between 10,000 and 99,999 people, earned incomes are higher, sometimes markedly so, than in urban areas of similar size in central areas. This has been true throughout the 25 years covered in the study.

Earned income per worker is a rough indicator of the prevailing wage rates: thus, it would seem that wages are in fact higher in small peripheral urban areas than in areas in proximity of Canadian metropoli.

This holds true if earned income per inhabitant is considered (figure 16). This indicator is no longer an indicator of wage rates, but rather of per capita income generated by employment. It can be seen from figure 16 that in 1996 earned income per inhabitant is highest in metropolitan areas, and declines with city size in central areas. In peripheral areas this is not the case: earned income per inhabitant is stable across city size. This means that for urban areas of fewer than 100,000 inhabitants, earned income per inhabitant is higher in peripheral than in central areas. Thus, it cannot be argued that higher wages (table 5) are 'justified' by higher numbers of dependents since even when these wages are spread over the entire population peripheral urban areas are better off.

Table 5: Earned income[6] by worker, index 100=large metro areas

	1971	1981	1991	1996
AM1	1,00	1,00	1,00	1,00
AM2	0,92	1,00	0,90	0,90
AC1	0,95	0,92	0,92	0,95
AC2	0,86	0,88	0,85	0,85
AC3	0,86	0,87	0,83	0,82
AC4	0,79	0,83	0,80	0,80
RC	0,72	0,80	0,78	0,78
AP1	0,87	0,90	0,86	0,86
AP2	0,89	0,91	0,84	0,85
AP3	0,85	0,91	0,84	0,85
AP4	0,88	0,92	0,86	0,86
RP	0,70	0,80	0,71	0,72

These figures have important repercussions for development in peripheral areas because they indicate that, even abstracting from transport costs, *peripheral areas in Canada are not low cost locations*.

Figure 17, which represents 1971 income, shows that the general pattern has not only persisted, but has been exacerbated, over time. Figures 16 and 17 also display an index of total income per inhabitant including transfers[7]. From figure

[6] In this report the term 'earned income' is exclusively reserved for the concept of income derived from work. Investment income, whilst it is considered as economic income, is not covered. Thus, the 'transfers' referred to in section this section in fact include some economic income, that derived from investment.

[7] Transfers include pensions, unemployment insurance, other government transfers, but also investment income. Strictly speaking this last is an economic income and in the context of this analysis would be better classified with earned income. Our data, however, do not permit this reclassification. Nevertheless,

16 it can be seen that the transfer system definitely redistributes incomes from high income to lower income areas: but since the lower income areas are not necessarily in the periphery, most central areas benefit from considerable transfer payments. On the other hand, the smallest peripheral urban areas are net sources, and not recipients, of transfers.

Comparing figure 16 to figure 17 it can be seen that the system of transfers has considerably increased over the 25 years of study. In 1971, there is very little difference in the before and after-transfer per capita income index, whereas by 1996 the distance between the two curves is greater the further away from average (unity) is the before-transfer index.

Such a comparison also shows that over time the per capita income disparities between the richest (AM1) and the poorest (RP) SRs have diminished. In 1971, RP per capita total income was 54% of AM1's. In 1996 it is 73%.

From the perspective of SRs, the transfer system appears to be functioning well, with income from the wealthier SRs being redistributed to the less wealthy. However, the less wealthy ones tend to be in central, rather than peripheral, locations.

Figure a4.3 and a.4.4 in annex 4 present some more recent income figures covering the 1995 to 1999 period: these are not directly comparable to those presented above, but they confirm our conclusions. Figure a.4.3 shows market income in five Québec peripheral regions - without distinguishing between urban and rural areas. It can be seen that market incomes are not only substantially lower than in Montreal but that, despite overall income rises between 1995 and 1999, market incomes in peripheral regions have been losing ground relative to the metropolis. However, figure a.4.4, which displays relative levels of disposable (after tax) income confirms the redistributive effect of government policy and of progressive taxation. Not only are after tax incomes in peripheral regions

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investment income being higher in the larger cities and metropolitan areas, the reclassification of such income would serve to reinforce the trends and patterns commented upon in this section.

substantially closer to after tax incomes in Montreal, but the decline relative to Montreal between 1995 and 1997 has been largely recovered by 1999.

This confirms our view that there is no fundamental income problem in peripheral areas: the fact that market incomes *are* substantially lower than in Montreal comes as no surprise. Only comparisons with market incomes in central non-metropolitan areas would enable us to establish whether market incomes in peripheral regions are substantially lower than those in central ones[8] - and the 1971 to 1996 evidence suggests that this is not the case, at least in comparably sized urban areas.

5.4 Education levels

In order to grasp the evolution and distribution of education levels, four indicators will be used. First, the two extremes of the qualification scale will be examined: university degree holders and people not having completed secondary school. Second, scientific and 'technical' qualifications will be examined as an example of the difference in educational profile between central and peripheral locations.

- University degree holders and people not having completed grade 9

The number of people with a university degree has been rising across the board between 1971 and 1996 (figure 18). The rate of growth has been fairly uniform across all SRs, and whereas the percentage of the population over 15 who are graduates in rural peripheral areas has risen from 2,1% to 6,3%, it has risen from 6,5% to 18% in the largest metropolitan areas. The percentage figures can be misleading. Whilst the largest metro areas may have three times more graduates relative to their population, the actual number of these people is approximately thirty times greater than in peripheral areas. It should also be noted that they are concentrated within three geographically small areas (Toronto, Montreal and Vancouver): in other words, we feel it necessary to point out that there is an

[8] Given the fact that these data are compiled according to administrative regions such comparisons would be difficult since the data are not fine enough to distinguish between urban and rural settings. In addition, urban size cannot be controlled for. We take these data as additional - if partial - evidence of the clear income patterns which emerge from the 1971 and 1996 data since nothing in them contradicts the conclusions drawn from the more detailed data.

overwhelming concentration of university degree holders in the largest metropolitan areas. Employers seeking a qualified workforce are likely to be attracted to this wide variety of qualified personnel.

Turning to non-metropolitan urban areas, it is interesting to note that for a given urban size, peripheral urban areas have higher concentrations of university graduates than central urban areas.

At the other end of the education scale, an almost identical but reverse pattern of growth and distribution is observed (figure 18). The percentage of people not having completed grade 9 has declined steadily. There are more such people in central urban areas than in peripheral ones, and their presence increases as urban size decreases. The principal difference with the distribution of graduates, apart from the reversal of all trends and relative positions, is the higher percentages of people not having completed grade 9 in metropolitan areas. Thus, metro areas not only have the highest percentage of graduates, they also have relatively high levels of the least qualified people. This is reminiscent of the earlier analysis of labour force participation rates, where it was noted that despite rapid employment growth, low labour force participation rates in metropolitan areas may be indicators of certain problems (lack of employment) for some categories of population. The high numbers of less educated people may also be an indicator of a similar nature: despite employment growth and a highly educated population, the other end of the spectrum – lack of jobs and low education – is also evident in metropolitan areas.

- *Scientific and technical qualifications*

For 1991 and 1996 data are available breaking down the nature of post secondary qualifications held by the population in each SR. Bearing in mind the current emphasis on the knowledge economy and innovation, the scientific and technical diploma/degree holders have been singled out for a more detailed analysis. Scientific qualifications are those held in pure or applied science, engineering and mathematics. Technical qualifications are in similar fields but for technicians.

From figure 20 it can be seen that the highest proportions of scientists/engineers are in metropolitan areas. In central areas this percentage drops quickly with urban size: it rises, however in the smallest central urban areas (AC4) and in central rural areas. We do not think that there are high numbers of scientific jobs in these small urban areas and in central rural areas, though there are no doubt some. We hypothesise that this rise in the percentage of scientists in the smallest central communities reflects residential choices and the possibility of an easy commute to larger central or metropolitan urban areas.

In peripheral urban areas the proportion of scientists is substantially below that found in metropolitan areas, though for any given urban size the percentage is slightly greater in peripheral areas than in central areas. This percentage decreases with size, and, unlike in central areas, the decrease carries on as one moves to the smallest peripheral urban areas and to peripheral rural areas.

The distribution of the proportion of technicians over SRs is different (figure 21): large metropolitan areas have the lowest proportion (though this proportion is still quite high, 7,5%), and all other types of central area – including smaller metro areas – have a proportion which lies between 8,6% and 9,6%. However, it is medium and small peripheral urban areas which have the highest proportions of technicians (between 10,2% and 10,7%). All peripheral SRs have a proportion of technicians greater than that in all central and metropolitan ones.

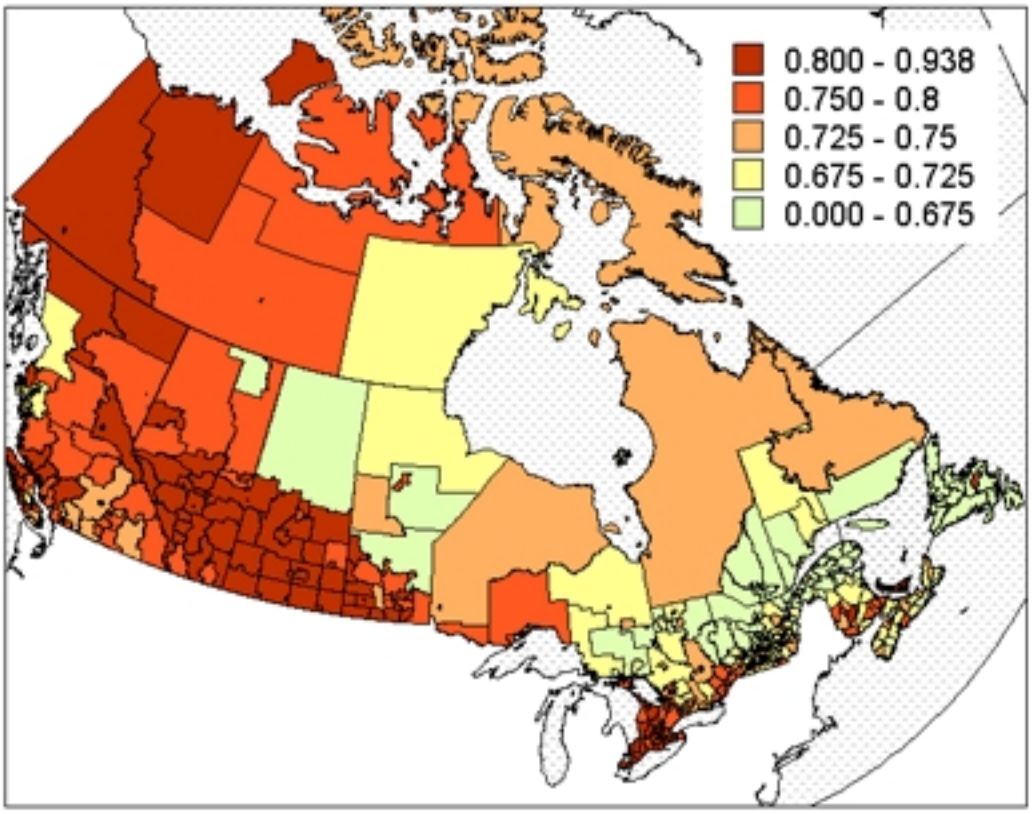
Two remarks can be made about the distribution of scientific and technically qualified people. First, despite the lower percentages, there are still far more scientific and technically qualified people in central than in peripheral areas. Second, within a given field such as science and technology, peripheral areas, whilst not without qualified residents, tend to have higher proportions of the lower qualified.

5.5 Conclusion

There can be no single conclusion drawn from the analysis of these various disparate socio-economic indicators, since each illustrates a different facet of society. On the whole, though, it cannot be said that the indicators under study

paint a systematically bleak picture for peripheral areas. It should be noted, however, that most of the analysis has dealt with ratios and proportions: whilst income per capita and labour force participation rates are not necessarily low in peripheral areas, their high levels may be due to the fact that population has fallen at least as fast as employment. These positive indicators do nothing to change the trends set out in section 2 relating to overall population and employment decline in most non-central areas. They do, however, provide some context within which to interpret the trends.

Map 5a: Labour force participation rate, 1996



Map 5b: Change in Labourforce participation rate, 1981 - 1996

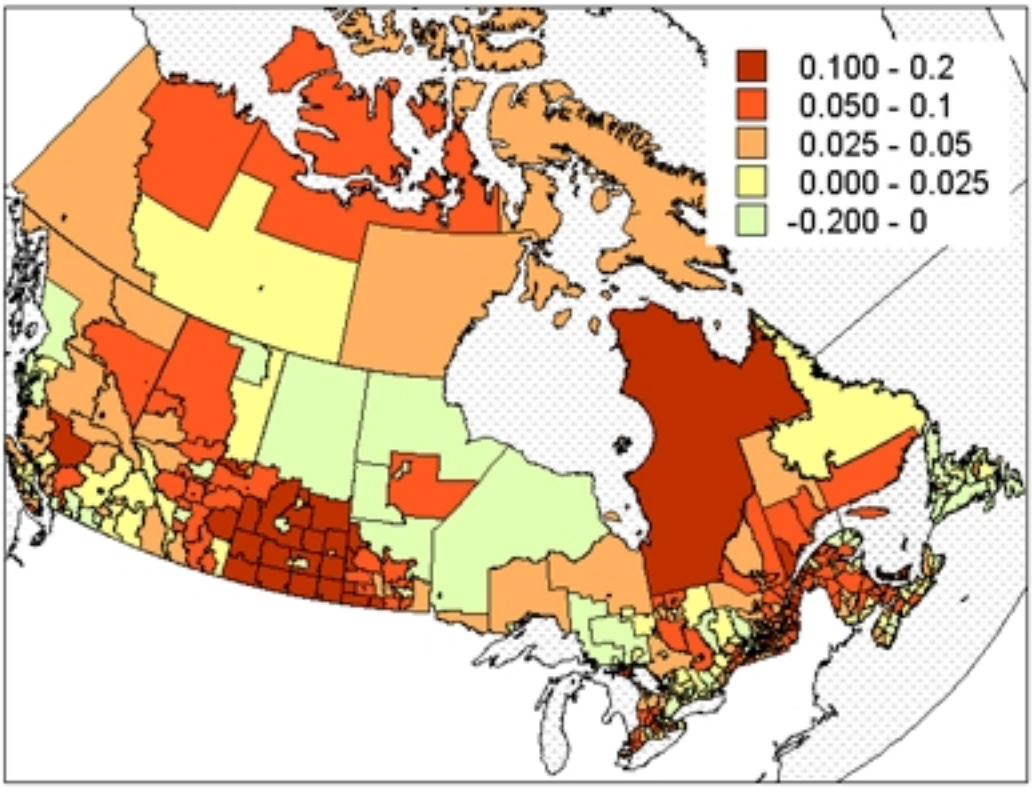


Figure 10: Total population.
Index=100 in1971

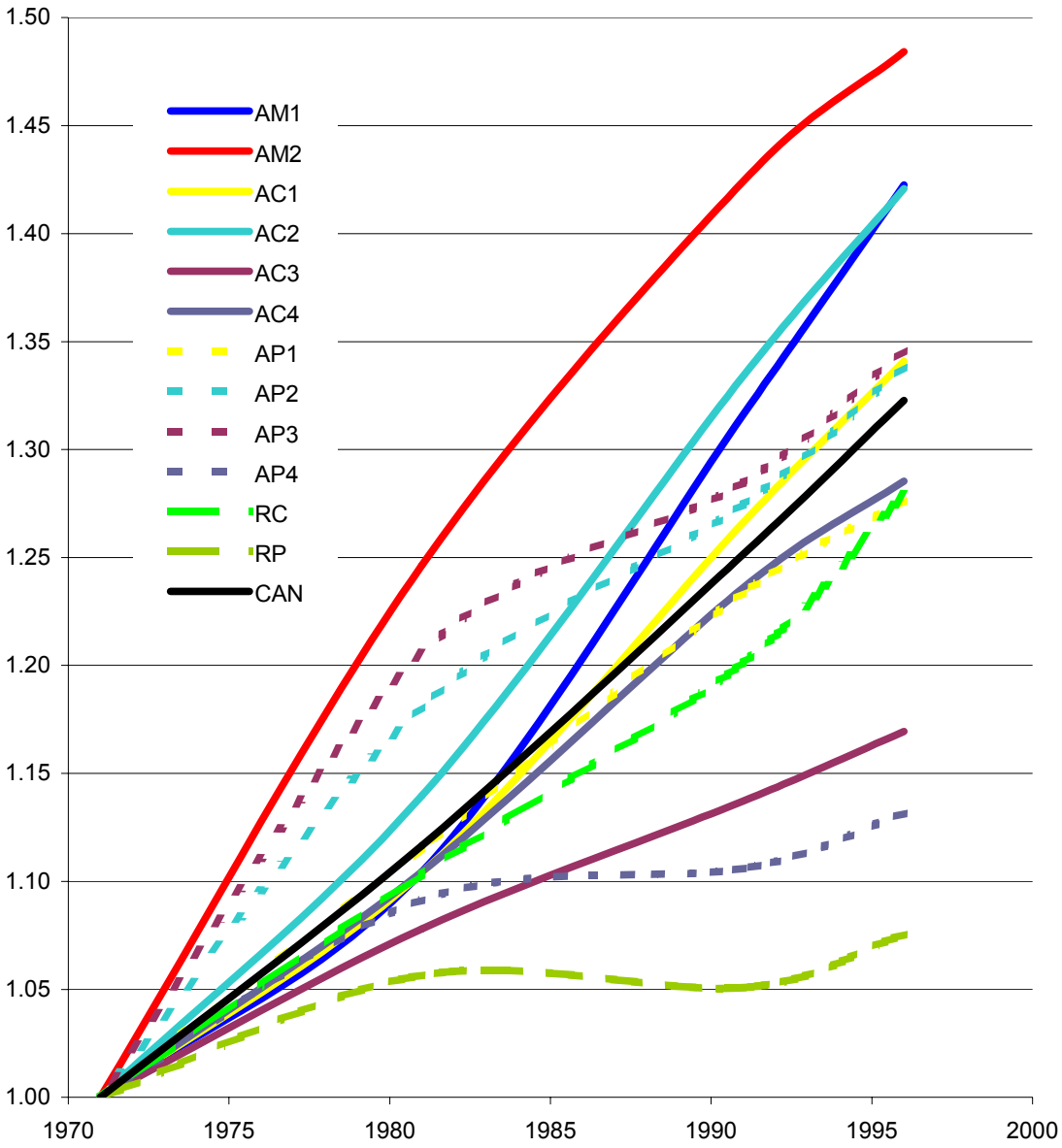


Figure 11: Proportion of population under 15 years in SRs, 1971 to 1996

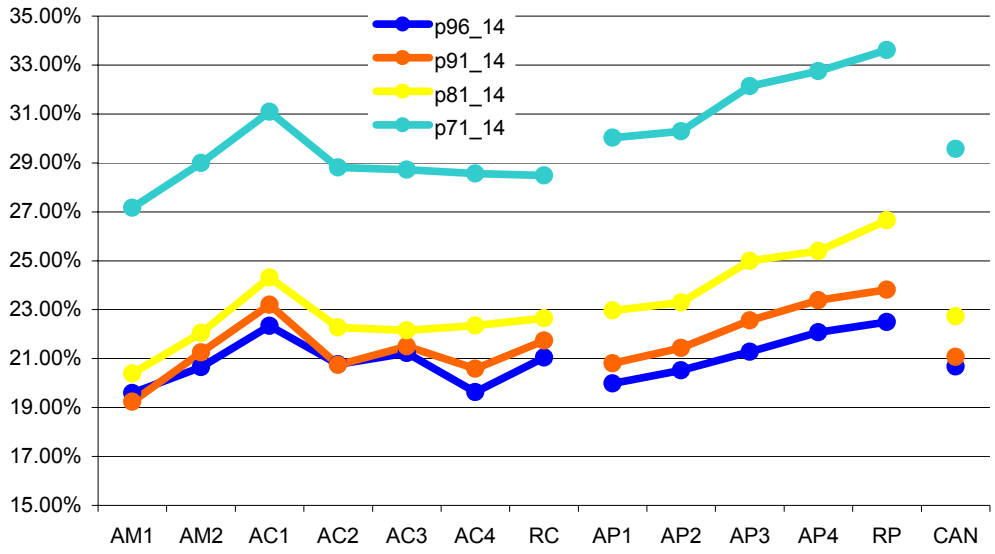


Figure 12: Proportion of population over 65, 1971 to 1996

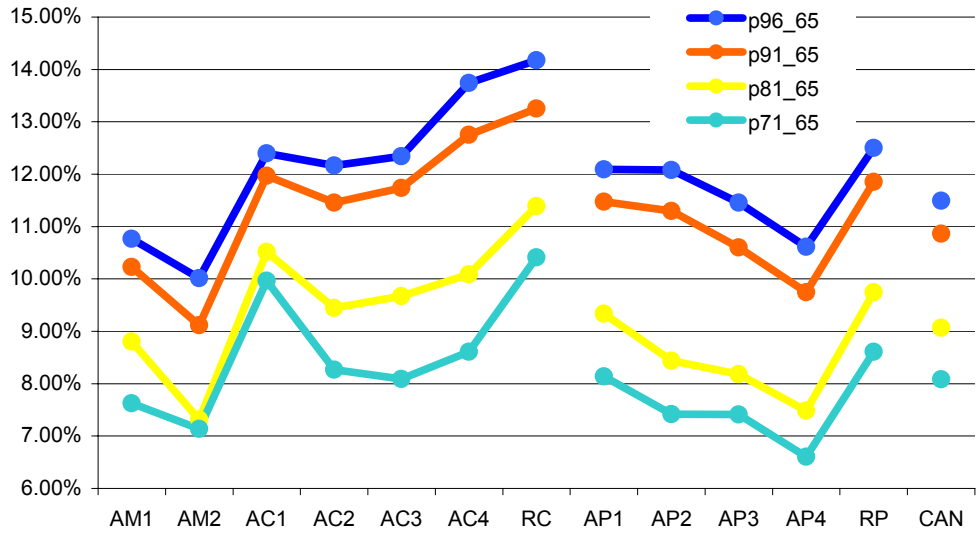


Figure 13: Proportion of population between 25 and 54, 1971 to 1996

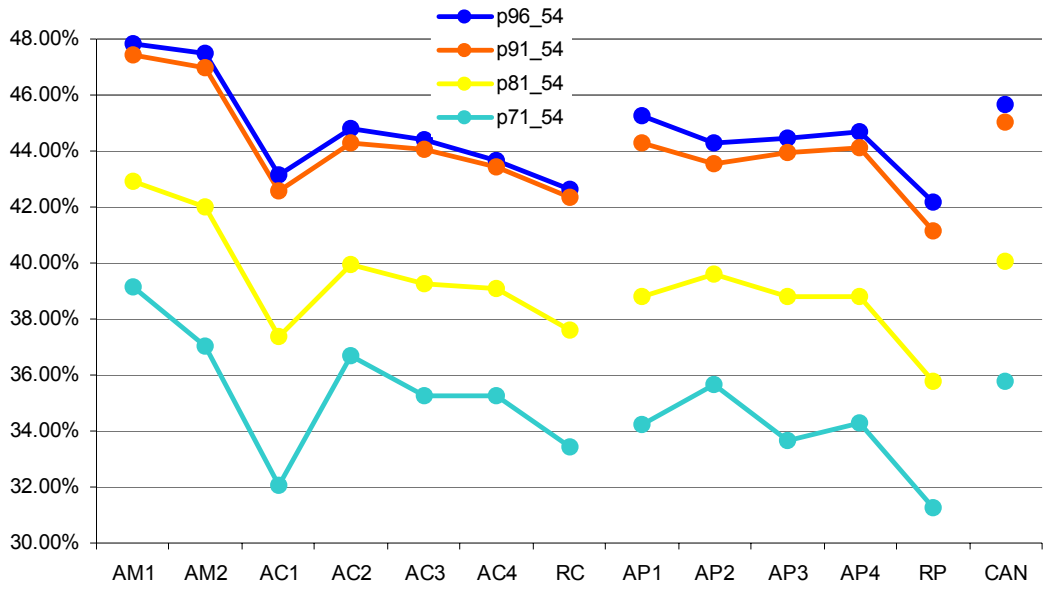


Figure 14: Ratio of under 14s and over 65s to total population, 1971 to 1996

(or number of dependents per person of working age)

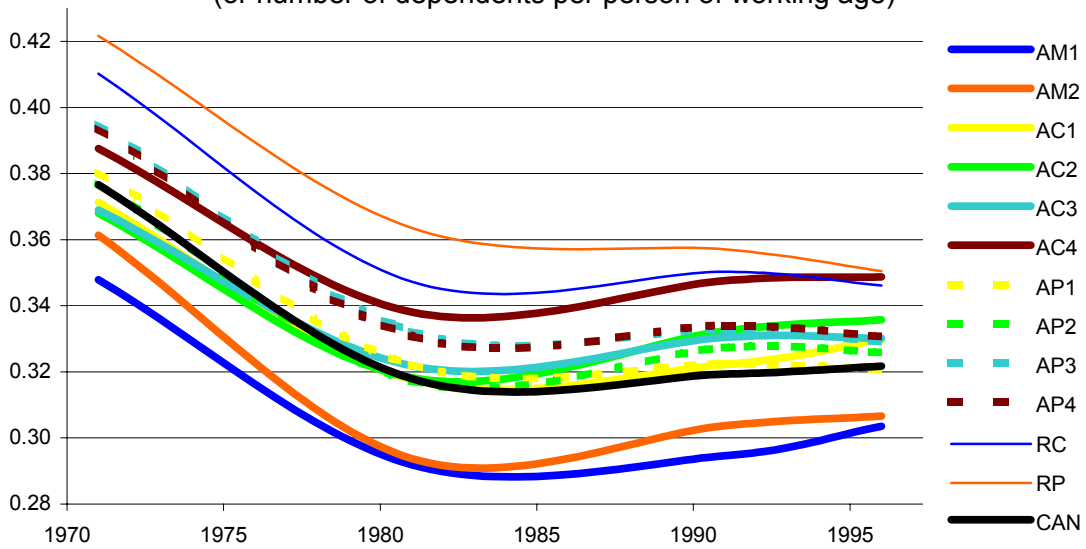


Figure 15: Labour force participation rate, 1971 to 1996

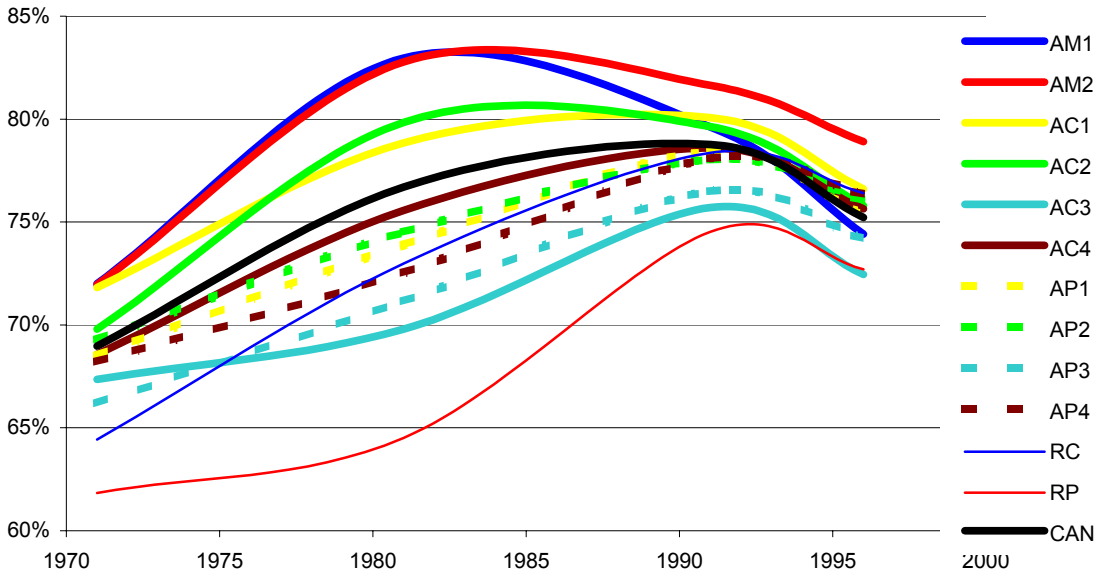


Figure 16: Earned (work) income and total income per capita, 1996

index Canada = 100

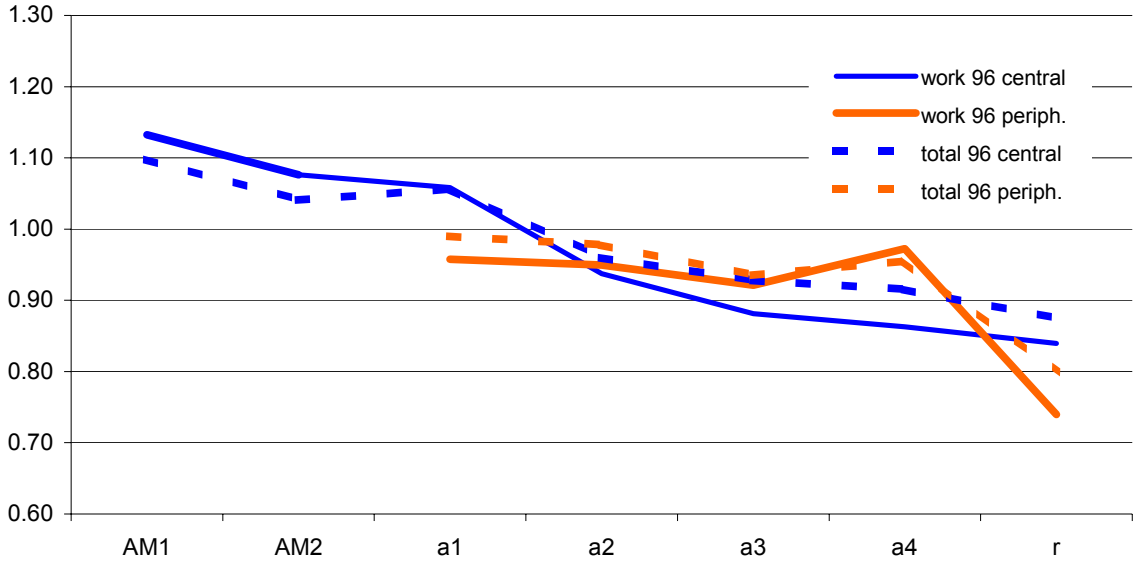


Figure 17: Earned (work) income and total income per capita, 1971

index Canada = 100

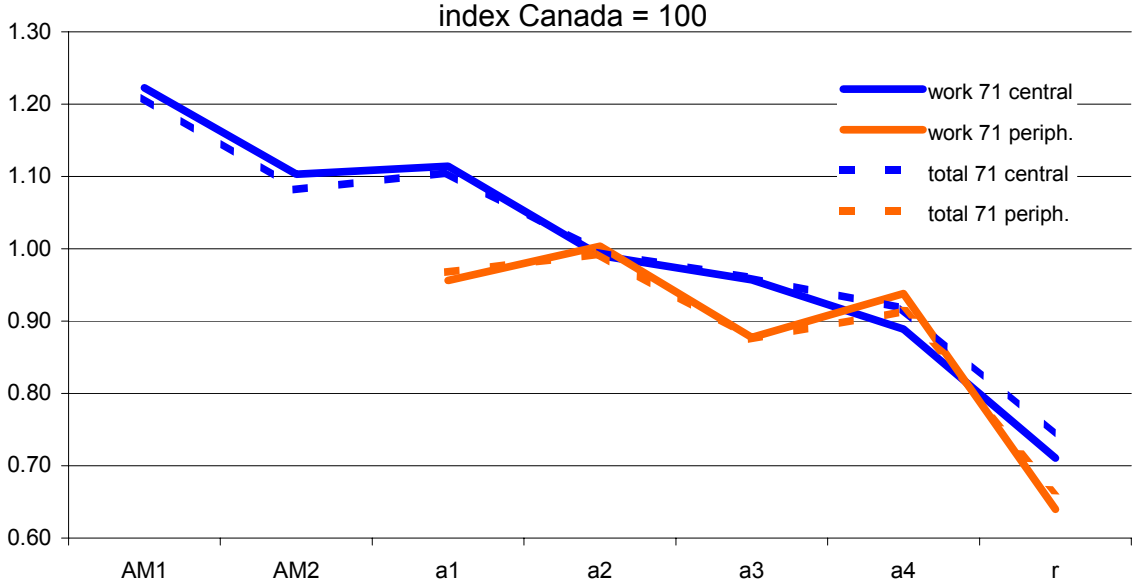


Figure 18: Percentage of population 15 years and older with university degree, 1971-1996

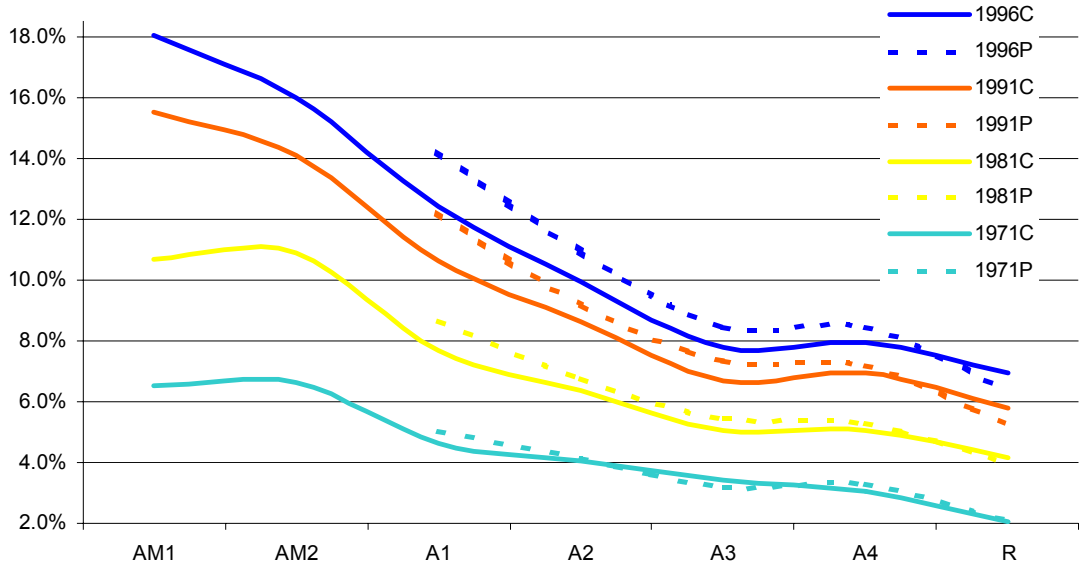


Figure 19: Percentage of population 15 years and older with less than grade 9 education, 1971-1996

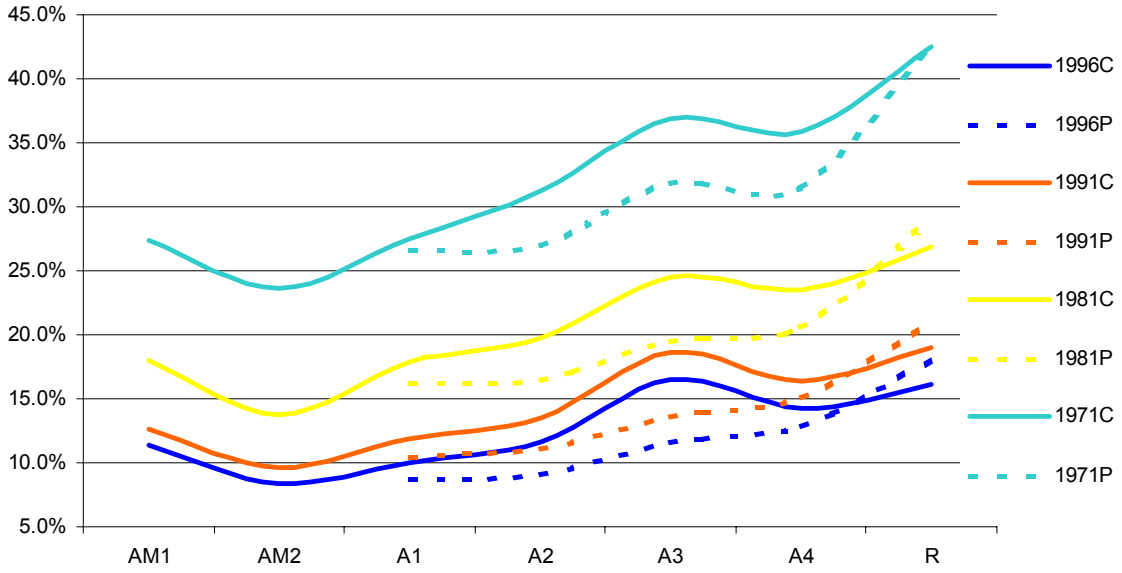


Figure 20: Percentage of population 15 years and older with scientific* qualifications, 1991 and 1996

(*agricultural and biological sciences, engineering and applied sciences (scientists), mathematics and pure sciences)

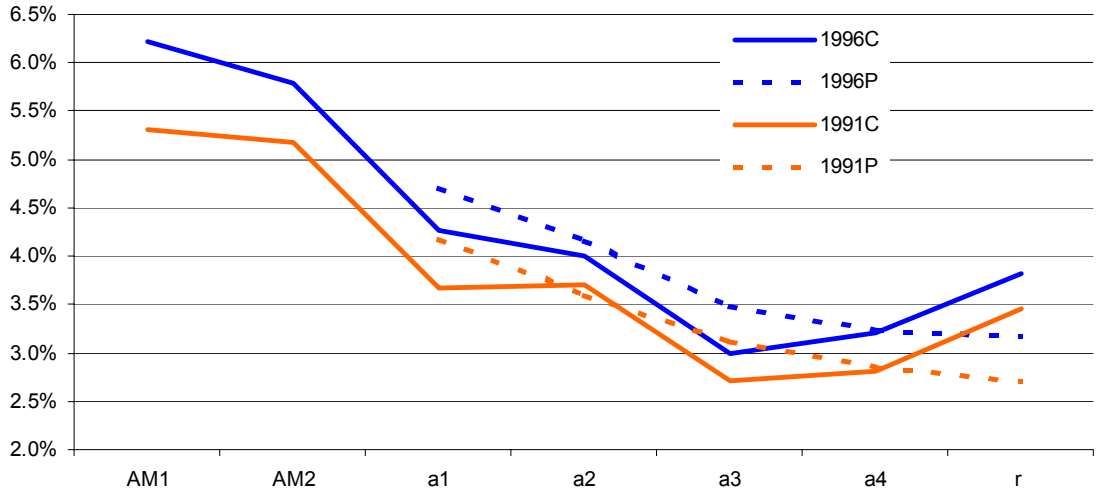
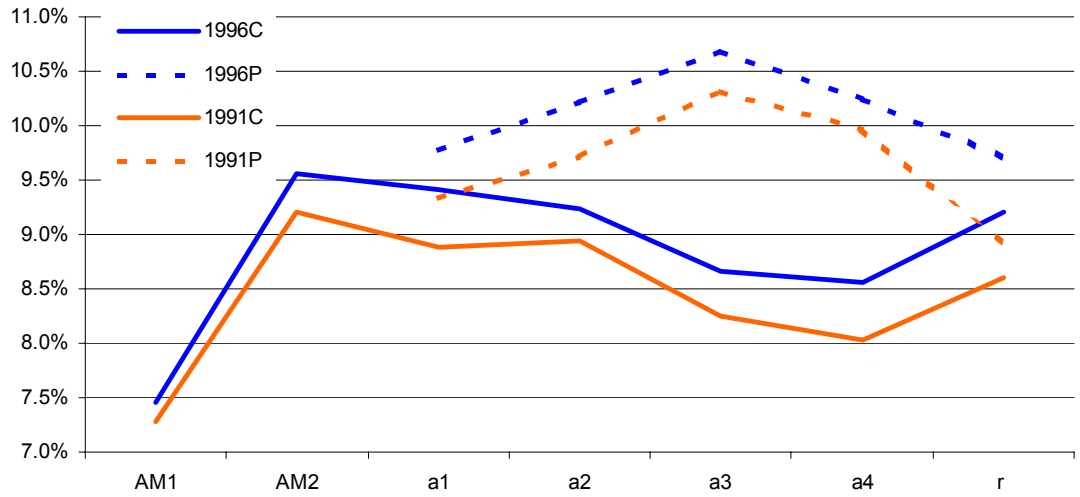


Figure 21: Percentage of population 15 years and older with technical* qualifications, 1991 and 1996

(*engineering and applied science (technical and trades))



PART III

6- Typology and evolution of Canadian regions

The general trends which emerge from the data to hand have been described in the preceding sections. From this point on the report presents a series of analyses which seek to confirm some of the hypotheses which emanate from the previous sections, and to explore a key underlying assumption. Indeed, the key to much of the analysis above is the geographic subdivision of Canada into synthetic regions. This subdivision makes theoretical sense, calling upon the notions of agglomeration economies and distance. In addition, it appears to have good explanatory power when it comes to understanding the distribution of economic activity.

In this section an alternative approach is taken to classifying the 382 spatial units (SUs) under analysis. The cluster analysis technique (described in Noyelle & Stanback, 1984; Coffey & Shearmur, 1996; Shearmur, 1997) is used to group SUs together which have a similar economic profile, based upon location quotients in each sector. In this way it can be seen which *combinations* of sectors tend to locate in which parts of Canada.

6.1 Typology of Canadian regions, 1996

Fourteen clusters of SUs have been identified (map 6): their profile is outlined in table 6.

Table 6: Summary industrial profile of each cluster

Cluster	n	Industrial structure
CL14	55	primary, LVA, retail, education, health and social services
CL15	42	primary, LVA, MVA
CL16	15	primary, transport, education, civil service
CL17	16	education, civil service
CL18	54	primary
CL19	25	construction, retail, hotels etc., leisure
CL21	45	primary, LVA, transport
CL24	27	primary, LVA, transport, education, civil service
CL28	28	LVA, MVA
CL31	24	primary, BVA, MVA, HVA, construction
CL32	13	communication, HTservices, professions, wholesale, FIRE)
CL36	26	primary, construction
CL42	5	leisure, hotels etc.
CL58	7	high-tech manufacturing

Table 7: Profile of clusters (mean location quotient of SUs in each cluster)

CLUSNAME	primary	LVA	MVA	HVA	construct.	transport	communi-cations	HT services	wholesale	retail	personal services.	hotels etc.	entertain-ment	FIRE	professions	education	health social security (HSS)	civil service
CL14	**139**	**131**	40	15	94	87	65	39	83	**122**	83	115	83	70	63	**120**	**139**	90
CL15	**236**	**230**	**188**	21	93	97	62	28	68	96	63	85	71	58	52	82	72	48
CL16	**194**	48	18	1	99	121	45	32	36	89	75	84	94	43	33	**149**	68	**351**
CL17	79	68	28	40	95	114	94	**111**	62	106	89	115	86	71	77	**122**	117	**221**
CL18	**609**	68	26	9	91	105	39	22	76	79	57	85	59	51	37	100	73	72
CL19	95	78	61	27	**121**	91	105	44	81	128	99	**135**	**125**	81	91	114	118	87
CL21	**247**	**200**	53	16	102	**138**	47	30	63	101	73	103	70	57	44	96	78	76
CL24	**221**	**141**	22	4	106	117	56	23	46	101	65	101	69	44	28	**144**	108	**134**
CL28	44	**121**	**270**	72	88	75	79	54	87	112	87	108	95	81	77	112	106	70
CL31	**201**	**127**	**151**	108	**121**	119	77	53	96	100	81	79	79	65	65	86	73	88
CL32	43	74	74	90	98	116	**122**	**112**	**118**	102	**107**	109	117	**113**	**109**	103	104	115
CL36	**196**	101	51	18	**173**	116	61	55	65	109	90	119	105	71	76	99	82	90
CL42	**126**	80	19	0	**124**	**135**	47	36	46	102	92	**293**	**186**	59	40	74	75	**120**
CL58	70	**140**	**181**	**438**	103	80	96	55	96	110	90	93	91	58	70	95	96	68

note: high mean values of location quotients have been highlighted. In general this is taken as being a mean of over 120, but in the case of sectors where the mean is low in all clusters, those clusters with relatively high mean location quotient values have also been highlighted

SUs in each cluster have a similar industrial structure based on the 18 sector classification of employment in Canada. It is interesting to note the variety of profiles which emerge and compare this with the clusters' geographic distribution.

Table 8: Cross-tabulation of 1996 clusters with synthetic regions

Frequency	AM1	AM2	AC1	AC2	AC3	AC4	RC	AP1	AP2	AP3	AP4	RP	Total
CL14	0	0	1	1	3	4	1	**3**	**3**	**12**	**13**	**14**	55
CL15	0	0	0	0	1	**4**	**24**	0	0	1	3	9	42
CL16	0	0	0	0	0	0	0	0	0	0	1	**14**	15
CL17	1	0	1	0	0	0	1	3	3	1	5	1	16
CL18	0	0	0	0	0	0	**9**	0	0	1	2	**42**	54
CL19	0	0	0	1	0	4	1	2	3	5	7	2	25
CL21	0	0	0	0	0	3	**11**	0	0	1	3	**27**	45
CL24	0	0	0	0	0	1	0	0	0	0	0	**26**	27
CL28	0	0	**7**	**8**	**6**	**6**	0	0	0	1	0	0	28
CL31	0	0	0	0	0	0	**17**	0	1	0	0	6	24
CL32	**3**	**4**	0	1	0	0	1	**4**	0	0	0	0	13
CL36	0	0	1	1	0	1	2	0	1	3	3	**14**	26
CL42	0	0	0	0	0	0	3	0	0	0	0	2	5
CL58	0	0	0	**1**	**2**	**1**	**3**	0	0	0	0	0	7
Total	4	4	10	13	12	24	73	12	11	25	37	157	382

For instance, there is a strong tendency for primary and LVA employment to concentrate in the same places (clusters 14, 15, 21, 31), and a certain propensity for LVA employment to locate in proximity to other manufacturing (clusters 15, 28, 31, 58); but in only two clusters do primary and other manufacturing combine (clusters 15 and 31). These two clusters, as can be seen from table 8, are overwhelmingly located in rural central areas and in Ontario and Quebec (table 9). Clusters 14 and 21, which only have primary and LVA - are predominantly in the periphery, and clusters 28 and 58, which have a variety of manufacturing but little primary are exclusively (all but 1 SU) central.

This reveals that in peripheral areas primary sector employment, if it is associated with manufacturing, is only associated with 'lower order' manufacturing. There are few peripheral areas in which primary sector employment is associated with manufacturers of finished products (predominantly in the MVA and LVA categories).

Another interesting combination of sectors is the public sector ones - education, health and social security, and civil service). Although they are rarely all three

present in the same clusters, at least two of the three are over-represented in clusters 14, 16, 17, 19, 24 and 32[9]. Except for cluster 32, which gathers large metropolitan areas, the other five clusters are predominantly made up of peripheral areas. Those clusters predominantly central in nature (clusters 15, 28 and 58) have low LQ's in these sectors. This shows that there is a tendency for SUs in the periphery to be more dependent on public sector jobs than SUs in central areas.

Clusters 14 and 19, predominantly made up of peripheral urban areas - and spread across most provinces -, also have the highest concentrations of retail employment: combined with the strong presence of public sector employment, this profile corresponds to that of service centres for surrounding areas.

In more general terms, it can be seen from table 8 that each industrial profile - or cluster - corresponds to a certain type of SR. For instance cluster 14 (primary, LVA, retail, education, HSS) is predominantly made up of small peripheral agglomerations and rural areas, whereas cluster 32 (communication, HT services, professions, wholesale, FIRE) corresponds to metropolitan areas and to the largest peripheral urban centres. Cluster 28 (low and medium value added industry) comprises only central urban areas, as does cluster 58 (which stands out as having high concentrations of high-tech manufacturing).

Notwithstanding the interesting profiles described above, the basic point being made is that the classification of the 382 SUs by synthetic region overlaps to a large extent their classification by industrial structure. The theoretical notions of agglomeration, metropolitan area and distance which served to define the synthetic regions also correspond to empirical observations of the distribution of industrial structure.

[9] Clusters 14 and 19 also have very high LQs in the retail sector. These clusters

Table 9: Cross-tabulation of 1996 clusters with provinces

Frequency	NF	NS	PE	NB	QC	ON	MN	SK	AL	BC	TR	Total
CL14	3	**7**	0	**5**	**26**	7	1	2	2	2	0	55
CL15	0	1	0	1	**27**	**11**	1	0	0	1	0	42
CL16	1	1	0	1	0	0	2	0	1	3	**6**	15
CL17	2	0	1	1	1	**6**	1	1	0	1	2	16
CL18	1	2	2	0	2	1	**12**	**15**	**15**	4	0	54
CL19	1	0	1	1	2	4	1	3	5	7	0	25
CL21	1	2	0	3	**20**	8	1	0	1	**9**	0	45
CL24	**6**	2	0	3	5	5	3	1	0	2	0	27
CL28	0	1	0	0	8	**19**	0	0	0	0	0	28
CL31	0	**5**	0	0	**7**	**10**	0	0	1	1	0	24
CL32	0	1	0	1	3	2	1	2	2	1	0	13
CL36	0	1	1	0	2	5	0	1	1	**15**	0	26
CL42	0	0	0	0	1	0	0	0	1	3	0	5
CL58	0	0	0	0	**4**	**3**	0	0	0	0	0	7
Total	15	23	5	16	108	81	23	25	29	49	8	382

Note: the highlighted numbers are those corresponding either to a high number of SUs or to a high proportion of a given province's SUs

Table 9 is similar to table 8 except it shows the distribution of clusters across the provinces. As already noted there are certain regularities: for instance clusters 14, 15 and 21 comprise, between them, over 60% of all SUs in Quebec. These three clusters have in common the strong presence of primary and low value added sectors. Although peripheral agglomerations in Quebec and Nova Scotia appear to be more dependent on public service jobs and retail than those in other provinces (cluster 14), a scattering of such agglomerations can be found across all provinces (clusters 14 and 19).

All seven high-tech manufacturing SUs (cluster 58) are located in either Ontario or Quebec. Cluster 18 - in which are gathered SUs with extremely high concentrations of employment in primary sectors - is mainly in the Prairies. Cluster 36, which combines high concentrations of primary and construction employment, is almost entirely in British Columbia. Although this report has focussed principally on synthetic regions, table 9 reminds us that administrative regions may also play an explanatory role in terms of understanding Canada's space economy.

6.2 Movement between clusters, 1971 to 1996

In this section we examine to what extent there has been a shift between clusters over the 1971 to 1996 period. In order to do this the 1971 SUs have been classified according to the 1996 cluster definitions, and the changes of classification between the two years are observed.

Table 10: Cross-tabulation of 1996 clusters with 1971 clusters

	1971														
1996	CL14	CL15	CL16	CL17	CL18	CL19	CL21	CL24	CL28	CL31	CL32	CL36	CL42	CL58	Total
CL14	26	0	1	2	2	7	3	8	1	2	1	2	0	0	55
CL15	3	1	0	0	3	1	**14**	3	2	**13**	0	2	0	0	42
CL16	0	0	9	1	2	0	0	1	0	0	0	0	2	0	15
CL17	4	0	1	11	0	0	0	0	0	0	0	0	0	0	16
CL18	1	0	1	0	41	1	3	5	0	0	0	2	0	0	54
CL19	2	0	1	1	1	16	1	0	2	0	0	0	1	0	25
CL21	0	0	0	0	4	0	24	4	0	7	0	4	2	0	45
CL24	1	0	0	1	5	0	1	12	0	1	0	3	3	0	27
CL28	4	0	0	0	0	2	0	0	18	3	1	0	0	0	28
CL31	0	0	0	0	1	0	2	0	0	18	1	1	0	1	24
CL32	0	0	0	2	0	0	0	0	1	0	9	0	1	0	13
CL36	2	0	1	0	1	3	4	2	0	1	1	8	3	0	26
CL42	0	0	0	0	1	0	2	0	0	0	0	0	2	0	5
CL58	0	0	0	0	0	0	0	0	1	4	0	0	0	2	7
Total	43	1	14	18	61	30	54	35	25	49	13	22	14	3	382

There is a certain consistency between the 1971 and 1996 classifications: the majority of SUs do not change classes, as witnessed by the high values in table 10's diagonal.

There are, however, some differences. Cluster 15 (primary, LVA, MVA) was practically non existent in 1971, but between 1971 and 1996 14 SUs from cluster 21 (primary, LVA, transport) and 13 from cluster 13 (primary, BVA, MVA, HVA, construction) moved to cluster 15. These moves, whilst of interest, are not fundamental since each cluster basically involves goods production.

Of more interest is the reduction from 14 to 5 of cluster 42 (tourism in rural areas): although tourism is being put forward as a means whereby peripheral regions can diversify, very few are reliant on the sector, and most rural areas which were reliant upon it in 1971 no longer are in 1996.

There has been little movement in or out of cluster 32, which gathers together the largest urban areas and has an industrial profile dominated by high-order services. Halifax, Quebec and one central rural area in BC have moved into this cluster whilst Lachute (Qc), London (On) and two rural areas have moved out.

All of the SUs which have moved into the high-tech cluster (cluster 58) are central areas in Ontario and Quebec. Four out of the five have moved from cluster 31, which itself has the second highest concentration of high-tech manufacturing. Only Belleville (On) has moved out of cluster 58 towards cluster 31.

In sum there has been little movement between clusters with fundamentally different industrial structures: at most there have been moves between clusters with similar characteristics. This should be borne in mind when policies of industrial diversification are considered: even over a 25 year period, it appears that there has been little *relative* shift in the structure of most regions despite the considerable shifts which have been observed across the Canadian economy as a whole.

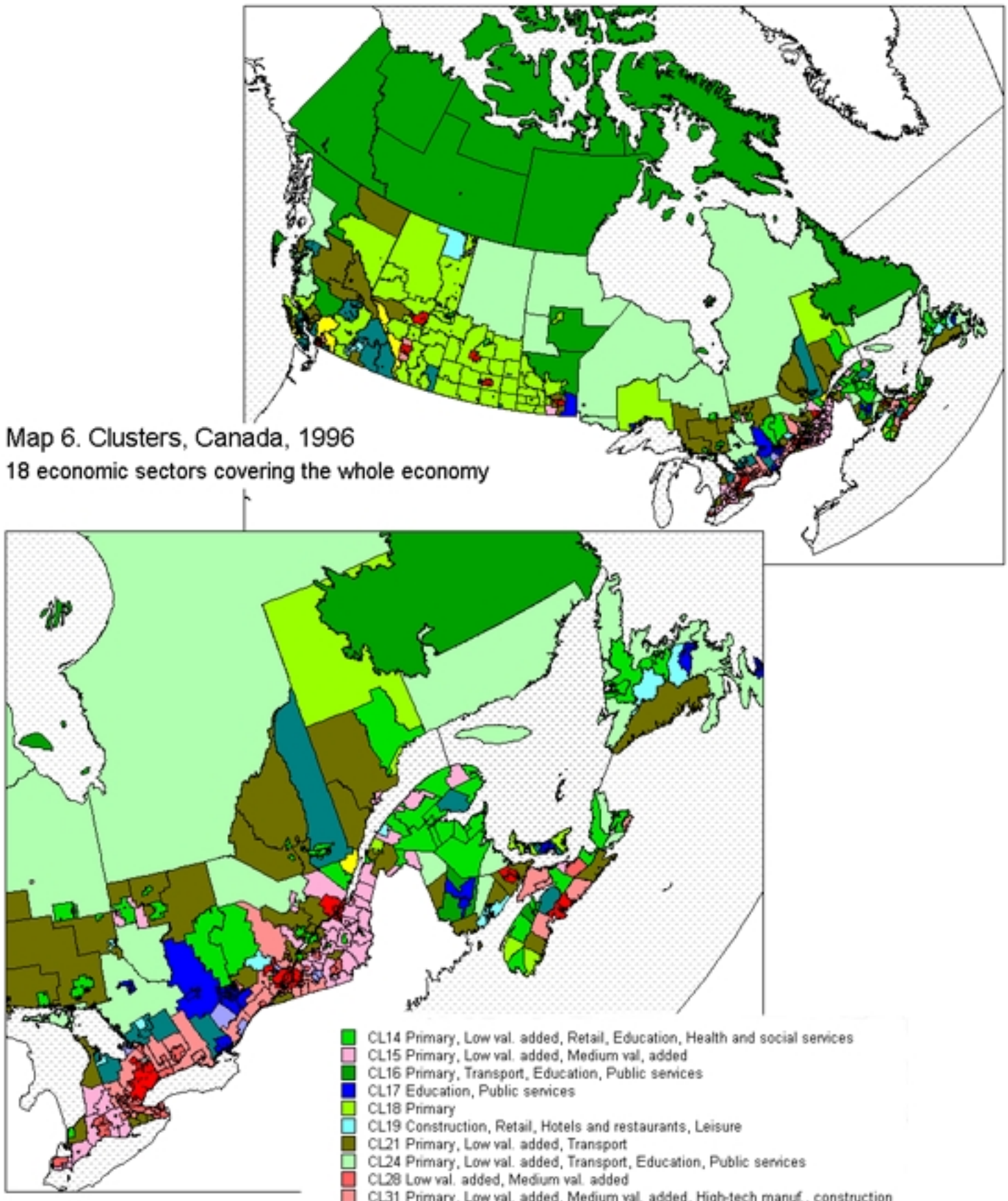
6.3 Conclusion

This section, which has been a little more technical than the previous ones, confirms our analysis of section 3. This is important since a completely different analytical approach has been taken. Indeed, in section 3 it was seen that for *individual economic sectors* the relative distribution of employment across synthetic regions remained basically unchanged between 1971 and 1996. In this section, no *a priori* geographic sub-divisions were used, and it is *the entire industrial structure*, not just the distribution of individual sectors, which is being analysed.

Still, the conclusions are basically the same. First it should be noted that there is a close correspondence between synthetic regions derived from *a priori* theoretical considerations and clusters derived from an analysis of industrial structure. This is further confirmation that agglomeration economies, distance and metropolitan areas are key concepts for understanding the distribution of

employment in the Canadian space economy, but also that an understanding of industrial structure usefully can enhance their application. Second, there is great stability, over the 25 year period, in the composition of clusters. The movements observed are between clusters with similar profiles, indicating only minor relative shifts in structure. Of course, this also means that all regions have been adapting at a similar rate to the wider structural shifts of the period (in particular the shift towards services).

Finally, each cluster tends to be more highly represented in a small number of provinces. This will be returned to in section 9.



Map 6. Clusters, Canada, 1996

18 economic sectors covering the whole economy

7- Typology and evolution of Canadian regions: cluster analysis of primary and first transformation sectors

So far the Canadian space economy has been analysed by way of an 18 sector classification of employment. However, as seen in sections 3 and 6, peripheral regions predominantly rely on primary and low value added manufacturing. Our data allow us to probe more deeply into these aggregated sectors. Such probing is particularly relevant since, as mentioned in section 6′s conclusion, economic diversification is regularly proposed as a possible solution to decline in peripheral regions. In particular, it is suggest that the first transformation of raw materials could occur closer to these materials' source, i.e. in peripheral resource dependent regions.

Table 11: The 18 primary and first transformation sectors

Primary	ag1	agriculture
	ag2	forestry
	ag3	hunting and fishing
	ag4	metallic mines
	ag5	coal mines
	ag6	petrol and natural gas
	ag7	non metallic mines
	ag8	oil wells and other mining services
1st transformation (and some others)	ag9	food except fish
	ag10	fish transformation
	ag11	wood transformation
	ag12	furniture
	ag13	paper
	ag14	transformation of metals
	ag15	metal products
	ag16	non metallic mineral products
	ag17	oil and coal products
	ag18	textile and leather

In order to investigate in more detail the distribution of primary and first transformation employment, 18 sectors[10] have been retained (table 11).

The industrial structure of synthetic regions for these 18 sectors has been analysed in the same way as the structure of the entire economy was analysed in

[10] It is coïncidental that the same number of sectors have been retained for this analysis as for the analyses of the entire economy.

section 6. Methodologically there is one difference: since these sectors are very small, there are some extreme values of locations quotients. Thus, to prevent outlying values having too great an influence it is the *ranks* of the location quotients, and not the location quotients themselves, which have been analysed.

7.1 Typology of Canadian regions according to their primary and first transformation industrial profile, 1996

Ten cluster have been identified, and these are described in table 12 (summary profile) and table 13 (detailed profile).

Table 13: Summary primary and first transformation profiles, 1996

Cluster	n	Nom
CL10	47	hunting and fishing, fish processing
CL11	55	metallic mines and transformation, wood products (forestry, wood transformation, paper)
CL12	50	agriculture, non metallic mines, oil et gas
CL13	26	coal and wood products (forestry, wood transformation, paper)
CL14	36	wood products (forestry, wood transformation, paper) and metal transformation
CL16	71	food processing, metal transformation and metallic products, non metallic mineral products, textile and leather
CL17	40	non metallic mines, furniture, metal transformation, metallic products, oil and coal products
CL21	22	hunting and fishing, metallic mines, fish processing
CL31	16	coal, oil and coal products
CL39	19	textile and leather, furniture, wood transformation, food processing

The very high mean location quotients in table 14 are not surprising: the smaller the sector analysed relative to the whole economy, the more likely it is to be unevenly distributed across space, and this leads to very high concentrations in some areas

Table 14: Profile of clusters (mean location quotient of SUs in each cluster)

CLUSNAME	agriculture	forestry	Hunting and fishing	Metallic mines	Coal mines	Petrol and natural gas	Non metallic mines	Oil wells and other mining services	Food except fish	Fish processing	Wood transformation	furniture	paper	Transformation of metals	Metal products	Non metallic mineral products	Oil and coal products	Textile and leather
CL10	104	**538**	**1619**	6	33	17	303	29	85	**1785**	**172**	32	**208**	25	37	83	90	38
CL11	81	**534**	**270**	**1073**	4	11	**174**	**191**	30	**264**	**450**	29	**352**	**336**	32	90	15	9
CL12	**601**	59	24	15	**329**	**336**	**271**	**555**	60	0	34	16	18	14	35	48	**202**	14
CL13	131	**586**	**329**	**328**	**2439**	**563**	114	**525**	30	**266**	**390**	15	**258**	41	46	66	57	17
CL14	144	**459**	57	126	0	8	**217**	46	96	25	**345**	46	**487**	**206**	38	**158**	19	40
CL16	**216**	44	29	5	4	4	142	8	**186**	15	109	137	112	**198**	**148**	**216**	52	**221**
CL17	**209**	136	42	52	0	10	**515**	24	145	103	145	**179**	105	**188**	121	**164**	**146**	**151**
CL21	53	**350**	**1275**	**1932**	0	24	142	**199**	11	**876**	35	9	81	47	10	17	3	6
CL31	**262**	65	**215**	45	**548**	**325**	**192**	**331**	102	130	78	68	28	82	57	134	**157**	45
CL39	**244**	**498**	52	5	0	0	129	0	**151**	3	**638**	**610**	120	67	117	118	54	**408**

Note: high mean location quotients have been highlighted in bold.

The profiles identified reveal – not unexpectedly – that the primary and first transformation industries come in distinct groups. The only sectors which appear to be ubiquitous are forestry and agriculture, which are quite highly represented in most clusters. Cluster 31 gathers spatial units with energy related employment, cluster 10 fishing and fish processing and cluster 16 mainly first transformation sectors.

However, despite the separation between clusters of processing sectors and clusters of primary sectors, there *are* links between some specific extractive activities and subsequent transformation of the extracted resource: in particular, between fishing and fish processing (clusters 10 and 21) and between forestry, wood transformation and paper (clusters 10, 11, 13, 14 and 39).

It is revealing that furniture is NOT linked to the wood products sectors, food processing isn't to agriculture, and metal transformation isn't to metallic mines; but metal products and transformation of metals are linked in clusters 14, 16 and 17.

From this sample of sectors it can be hypothesized that a weberian logic is at work: paper and planks are easier to transport than raw wood, and processed fish easier to transport than fresh fish. For these products the extractive and processing activities are geographically linked. But sectors where the input is more refined (metal products, furniture) or where the raw produce is easier to transport (food processing) are not closely linked with the related extractive activity. In the case of metallic transformation it appears that links to the market (the metal products sectors) are more important than links to the extractive activity, and this may also play a role in the food processing sector.

There is a close fit between synthetic regions and industrial profile for the primary and first transformation sectors. Whereas clusters 10, 11, 12, 13 and 21 (none of which have concentrations of extractive activities other than those geographically linked to resources) are almost exclusively peripheral, clusters 16 and 17 (with the widest variety of processing activities) are almost exclusively central. Cluster 31 (oil and gas) contains 5 of the 8 metropolitan areas and 3 of the 12 largest

peripheral cities and cluster 14 (wood, metal processing, non metallic mines), which bridges the peripheral/central divide, contains only rural and small urban areas. Thus, an examination of the geographic distribution of these primary and transformation clusters confirms the pertinence of the synthetic regions as an analytical device, but also reveals interesting geographic links (and lack of links) between various sectors. .

Table 15: Cross tabulation of primary and transformation clusters with synthetic regions

Frequency	AM1	AM2	AC1	AC2	AC3	AC4	RC	AP1	AP2	AP3	AP4	RP	Total
CL10	0	0	0	0	0	0	1	3	2	1	3	**37**	47
CL11	0	0	0	0	0	1	0	2	3	**9**	**7**	**33**	55
CL12	1	0	0	2	0	3	5	1	1	2	8	**27**	50
CL13	0	0	0	0	0	0	1	1	2	**7**	**3**	**12**	26
CL14	0	0	0	0	0	2	7	0	0	3	**11**	**13**	36
CL16	0	0	**3**	**8**	**9**	**15**	**27**	1	3	1	0	4	71
CL17	**1**	**1**	**7**	**3**	**3**	**1**	**18**	1	0	1	0	4	40
CL21	0	0	0	0	0	0	0	0	0	1	**5**	**16**	22
CL31	**2**	**3**	0	0	0	0	**6**	**3**	0	0	0	2	16
CL39	0	0	0	0	0	2	8	0	0	0	0	9	19
Total	4	4	10	13	12	24	73	12	11	25	37	157	382

Clusters 16 and 17 – central clusters - stand out as having high location quotients in most processing industries and low location quotients in most primary industries. Cluster 31, metropolitan areas and large peripheral cities, has a somewhat surprising profile since it has high concentrations of employment in forestry, hunting and fishing, coal mines, oil and natural gas, non metallic mines and oil wells. This can be explained by the fact that it is dominated by spatial units in the Edmonton-Calgary corridor (it also includes Toronto, Saskatoon and St.John's). The presence in this cluster of some large urban areas outside the Prairies can be explained by the location there of management occupations within these primary sectors[11]. This cluster is unique in having employment in each of the 18 sectors: all other clusters have an *average* location quotient of

[11] In this section, the cluster analysis has been performed on the RANK of each variable and not on the variable itself, owing to the bi-modal distribution (extremely high and near zero values) of location quotients in most of the primary and transformation sectors. This means that in the case of sectors present in a limited number of SUs, sectors with a very small presence of employment in the sector can end up being classified with those with very high levels of employment: a sharp distinction is made between a small presence and none at all. In our opinion this can also partly explain the grouping of SUs found in cluster 31.

below 20 in at least one sector. In other words, the cluster which gathers the most large cities displays the most diversified economic structure, even within this narrow selection of industries.

From table 16 it can be seen that classification of the 382 spatial units into clusters based upon primary and transformation industries is strongly related to provincial divisions. For instance cluster 14 – which combines wood products, metal processing and non metallic mines - is almost exclusively made up of spatial units in Quebec, mainly rural ones (both central and peripheral). Cluster 16, a cluster which exhibits high concentrations of processing industries, is almost exclusively a Quebec and Ontario phenomenon. The “hunting and fishing” clusters (clusters 10 and 21) mainly gather spatial units from provinces with a coastline, and the wood products, metallic mines and metal transformation combination (cluster 11) appears to be unique to British Columbia and Quebec.

Table 16: Cross-tabulation of primary and transformation clusters with provinces

Frequency	NF	NS	PE	NB	QC	ON	MN	SK	AL	BC	TR	Total
CL10	3	16	5	4	7	1	0	0	0	11	0	47
CL11	3	2	0	2	**15**	13	4	2	0	**14**	0	55
CL12	1	0	0	0	0	3	8	**21**	**15**	0	2	50
CL13	0	1	0	4	1	3	0	0	7	10	0	26
CL14	1	1	0	3	**19**	5	2	0	0	5	0	36
CL16	0	0	0	0	**28**	**38**	3	0	1	1	0	71
CL17	0	1	0	2	**17**	**16**	1	0	0	3	0	40
CL21	6	0	0	0	3	1	4	0	0	2	6	22
CL31	1	2	0	0	1	1	1	**2**	**6**	2	0	16
CL39	0	0	0	1	**17**	0	0	0	0	1	0	19
Total	15	23	5	16	108	81	23	25	29	49	8	382

In sum, the analysis of primary and first transformation profiles reveals that areas with high concentrations of transformation employment tend to be located in central areas and in Ontario and Quebec, that the energy related profiles (clusters 12 and 31) are principally in Saskatchewan and Alberta, that fishing occurs along the coast and that forestry and agriculture are fairly ubiquitous. In many ways this confirms the obvious, but in so doing it also underlines the fact that each geographic area plays a fairly specific economic role, even within the narrow range of sectors analysed in this section.

7.2 Movement between clusters, 1971 to 1996

Between 1971 and 1996 most spatial units remained in the same cluster, though changes are more frequent than in the case of clusters based upon the whole economy. Only movement in and out of clusters 16, 17, 31 and 39 will be examined since it is these clusters which gather the "unlinked" transformation industries upon which hopes are pinned for a revival of resource based economies.

Table 17: Cross tabulation of 1996 and 1971 clusters

	1971										
1996	CL10	CL11	CL12	CL13	CL14	CL16	CL17	CL21	CL31	CL39	Total
CL10	29	4	0	3	4	0	3	4	0	0	47
CL11	6	26	0	9	7	0	3	4	0	0	55
CL12	1	1	31	1	4	1	3	1	7	0	50
CL13	3	9	1	9	1	0	1	0	2	0	26
CL14	0	4	1	1	19	2	1	2	0	6	36
CL16	0	0	1	0	3	46	12	0	4	5	71
CL17	3	1	0	1	1	8	21	0	3	2	40
CL21	1	1	1	1	0	0	1	17	0	0	22
CL31	0	0	3	0	0	0	4	0	9	0	16
CL39	0	0	0	0	2	1	1	0	0	15	19
Total	43	46	38	25	41	58	50	28	25	28	382

Between 1971 and 1996, 19 SUs moved from clusters 17, 31 and 39 to cluster 16, a relatively minor shift since it involves passing between clusters which have high location quotients in a variety of processing industries. Only four have moved into 16 from other clusters, three (Kelowna, BC; the rural area around Rimouski; the Beauce area South of Quebec City) from cluster 14 and one (rural area around Brandon, MN) from cluster 12.

Movement into cluster 17 has also principally been from other "processing" clusters, though three have moved in from cluster 10 (Matsqui, BC; Chilliwack, BC; and Truro, NS), and one each from clusters 11, 13 and 14 (three rural peripheral regions).

Movement into cluster 31 (oil and gas) has also been principally from other "processing" clusters, except for three units from cluster 12, all rural areas in

Alberta and Saskatchewan. Finally, the only notable movement into cluster 39 has been 2 units from cluster 14 (Matapédia, QC; and peripheral rural area in BC).

On the whole therefore, there has been very little substantial change in the profile of the 382 spatial units between 1971 and 1996. Although many have changed clusters, these changes have not tended to be from a resource towards a processing profile, but rather between clusters with similar profiles. However, the few examples of more significant changes mentioned above demonstrate that, over the long term, changes may be possible[12].

7.3 Conclusion

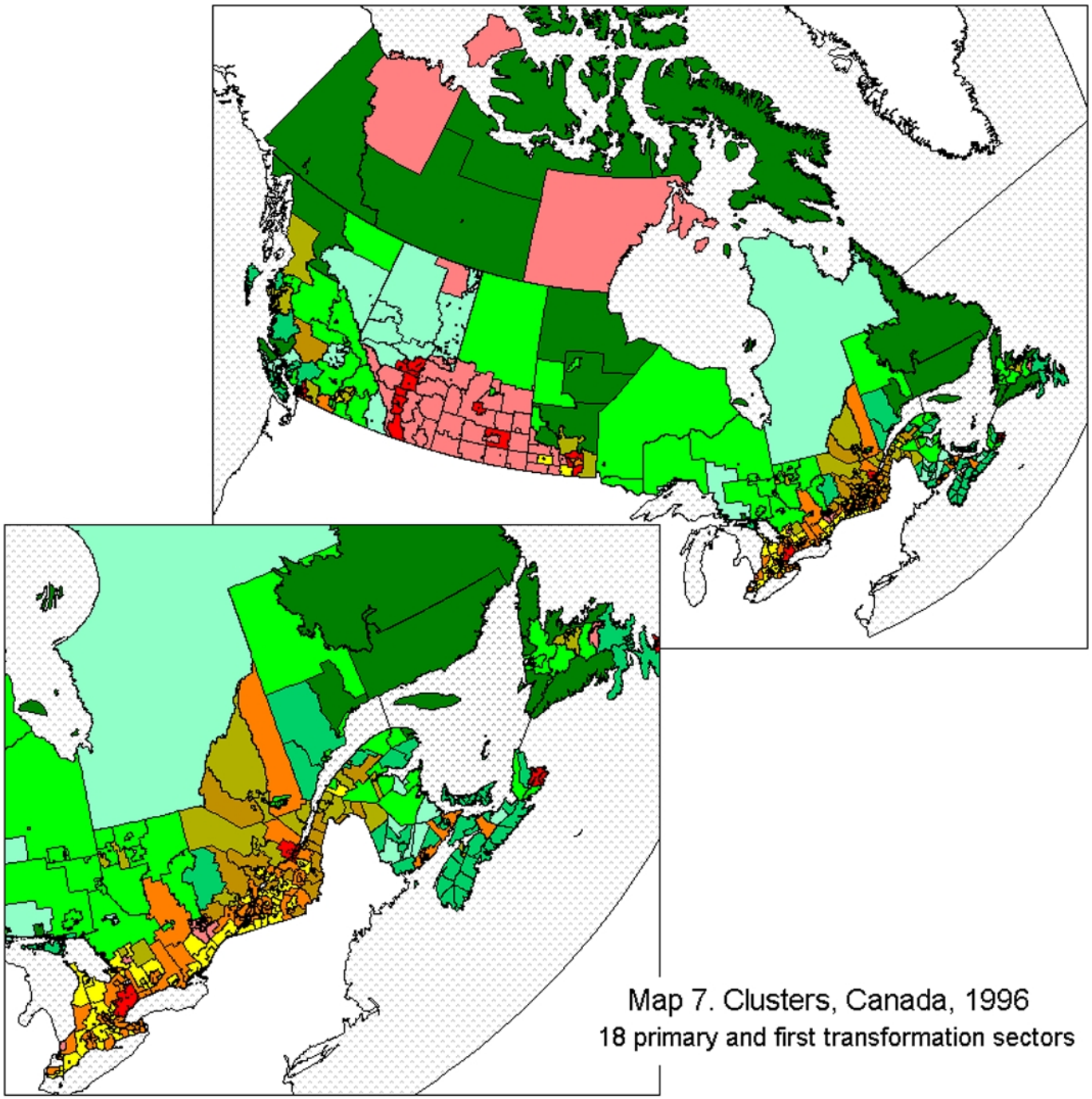
Apart from documenting in some detail the distribution of primary and processing industries across Canada, this section has addressed the possibility that areas relying on resource extraction in 1971 may have moved towards processing in 1996.

In terms of location, the analysis uncovered few surprises. On the whole it confirmed that whilst there are undoubtedly some processing industries in peripheral areas – particularly fish processing, wood transformation and paper mills – the areas which gather a wide variety of processing industries tend to be located centrally, and predominantly in Ontario and Quebec.

In terms of the evolution of industrial profiles, our analysis suggests that extremely few spatial units have moved from a primarily resource based economy to one based upon a certain variety of processing industries. In our opinion, given the fuzziness inherent in cluster analysis[13], the examination of the few exceptions identified above would not prove fruitful: only if a large number of such transfers had been observed could any more specific conclusions be drawn.

[12] See footnote 9 below.

[13] At the margin the classification of a unit into one cluster or another may be determined by very small variations in location quotients. Thus, whilst the overall picture of the economy which emerges is useful and largely correct, the precise details of the classification should be treated with caution.



Map 7. Clusters, Canada, 1996
18 primary and first transformation sectors

- CL10 Hunting and fishing, Fish processing
- CL11 Metal (mines and transformation), Wood products
- CL12 Agriculture, Non-metallic mineral mines, Petrol and gas
- CL13 Coal, Wood products
- CL14 Metals *transformation), Wood products
- CL16 Food processing, Metal products, Non-metallic products, Textile and leather
- CL17 Non-metallic mineral mines, Furniture, Metal prod., Petrol and coal prod.
- CL21 Hunting and fishing, Petrol and coal products
- CL31 Coal, Petrol and coal products
- CL39 Textile and leather, Furniture, Wood transformation, Food processing

8- Constituents of income per capita in Canadian regions

In section 4 income per capita, demography and labour force participation rates were examined separately. It was found that labour force participation rates displayed a particular regional pattern, and that certain demographic and income variables varied consistently across synthetic regions. In this section we seek to understand how these three variables interact to produce either high or low levels of economic dependency across Canadian spatial units (SUs).

These three variables can be linked, since all contribute to the variable 'earned income per capita'. This variable is of interest since it provides some indication of the economic autonomy of each region.

The variable “earned income per capita”, or I_w^c can be expressed in the following way:

$$I_w^c = I_w / p$$
$$= \left(I_w / e \right)\left(e / p_a \right)\left(p_a / p \right)$$

where:

I_w^c = earned income per capita[14] (income derived from employment per capita)
I_w = total earned income in region
p = total population in region
e = total employed population in region (population with an earned income)
p_a = total working age (15 to 64 years) population in region

Each expression in this equation corresponds to one of the variables studied independently in section 4. With this in mind, the equation becomes:

$$I_w^c = I_w^e * a * (1 - d)$$

[14] In this report the term ‘earned income’ is exclusively reserved for the concept of income derived from work. Investment income, whilst it is considered as economic income, is not covered. Thus, the ‘transfers’ referred to in section 3 in fact include some economic income, that derived from investment.

where I_w^e is the earned income per worker (or estimate of average salary), a is the labour force participation rate (percentage of working age population with a job) and d the dependency ratio (percentage of the population too old or too young to work).

In this context an analysis has been made of the 1996 "earned income per capita" variable (see figure 16) in order to determine its constituents. In other words, answers are being sought to the following questions:

- are high levels of earned income per capita attributable to higher labour force participation rates (a), higher salaries (I_w^e), more working age population ($1-d$), or a combination of the three?
- conversely, are low levels of economic independence (as measured by earned income per capita) attributable to labour market, wage[15] or demographic factors?

8.1 Income profiles of Canadian spatial units

The technique used to perform the analysis is the same as that presented in the two previous sections: a cluster analysis of the 382 spatial units has been performed in order to identify SUs with similar combinations of these three variables.

From table 18 it can be seen that various combinations of the three variables lead to similar outcomes in terms of earned income per capita. At the two extremes the link between the three variables and per capita income is clear and unsurprising: areas with low wages, low labour force participation rates and high dependence have very low per capita incomes, whereas those with high wages, high labour force participation rates and low dependency have high per capita income. Earned income per capita is closely related to wages (earned income per worker), but whereas the ratio of lowest to highest wage (I_w^e) is just over 1:2,

[15] The variable analysed is NOT a wage variable, but one which is roughly indicative of wages. 'Wage' is used as a shorthand to prevent the repetition of 'earned income per worker'.

the ratio of lowest to highest earned income per capita (I_w^c) is 1:4. At the extremes, therefore, low wages are exacerbated by low occupation rates and high dependence, and high wages are reinforced by high participation and low dependence.

Table 18: Profile of income clusters, 1996

name	n	I_w^e	a	$1-d$	Profile	I_w^c
CL22	3	35 909	0,75	0,75	H H H	21 080
CL16	42	29 035	0,80	0,69	H H H	16 004
CL19	23	26 655	0,69	0,70	H L H	13 406
CL24	16	24 138	0,81	0,69	- H H	13 418
CL13	84	25 026	0,77	0,65	- H -	12 571
CL33	23	22 380	0,84	0,62	- H L	11 773
CL29	15	23 668	0,74	0,61	- - L	10 819
CL17	43	21 757	0,69	0,69	- - H	10 755
CL14	62	19 667	0,72	0,66	L - -	9 550
CL23	26	18 362	0,82	0,60	L H L	9 221
CL32	24	21 282	0,63	0,66	- L -	8 657
CL35	16	17 628	0,57	0,69	L L H	6 990
CL26	5	16 454	0,51	0,57	L L L	5 222
Canada						13 727

note: the profile column summarises the three variables. H=high; - = average; L = low. Thus for example, cluster 13, with profile -H-, has average wages (I_w^e), high labour force participation rates (a) and an average proportion of the population of working age ($1-d$).

Employment by itself does not lead to high incomes: in clusters 23 and 14 very high labour force participation rates do not overcome low earned income and a dependent population. Bearing in mind the nature of our data (which do not distinguish between types of employment), low earned income may be due to low wage rates, seasonality or part-time employment. In the same way, high labour force participation rates may reflect the fact that most working age people obtained at least one seasonal job within the year.

The profile of cluster 19, in which high wages and low dependency do not lead to particularly high incomes per capita reflects the depressing effect which low labour force participation rates can have upon an economy.

Table 19 and map 8 reveal that, on the whole, synthetic regions are not strongly related to income clusters. In contrast with industrial profile based clusters, there are few clusters which gather only central or peripheral SRs, or which only gather

large or small urban areas. The three SRs in the highest income cluster are all in the rural periphery. In the other high income clusters (16 and 19) there are also a good number of rural peripheral SRs: thus, as emphasised in section 4, there does not appear to be any systematic income problem in these areas.

Table 19: Cross tabulation of income clusters with synthetic regions, 1996

Frequency	AM1	AM2	AC1	AC2	AC3	AC4	RC	AP1	AP2	AP3	AP4	RP	Total
CL22	0	0	0	0	0	0	0	0	0	0	**2**	**1**	3
CL16	3	2	6	2	0	0	2	3	2	4	7	11	42
CL19	1	1	1	0	1	0	1	**3**	**1**	**8**	**2**	**4**	23
CL24	0	1	0	1	0	0	2	**3**	**3**	**0**	**3**	**3**	16
CL13	0	0	2	4	7	12	19	2	4	6	8	20	84
CL33	0	0	0	0	0	4	7	0	0	1	3	8	23
CL29	0	0	0	1	0	1	1	0	0	1	1	10	15
CL17	0	0	1	5	4	3	9	0	0	3	7	11	43
CL14	0	0	0	0	0	2	21	0	0	2	2	35	62
CL23	0	0	0	0	0	0	6	0	0	0	0	**20**	26
CL32	0	0	0	0	0	2	5	1	1	0	2	13	24
CL35	0	0	0	0	0	0	0	0	0	0	0	**16**	16
CL26	0	0	0	0	0	0	0	0	0	0	0	**5**	5
Total	4	4	10	13	12	24	73	12	11	25	37	157	382

Table 20: Cross tabulation of income clusters with provinces, 1996

Frequency	NF	NS	PE	NB	QC	ON	MN	SK	AL	BC	TR	Total
CL22	1	0	0	0	1	0	0	0	0	0	1	3
CL16	0	0	0	0	0	**13**	1	1	**6**	**20**	1	42
CL19	1	0	0	0	**15**	6	0	0	0	1	0	23
CL24	1	1	1	2	0	0	1	1	4	4	1	16
CL13	0	1	0	1	4	**47**	5	2	6	**16**	2	84
CL33	0	0	0	0	0	6	2	**7**	**8**	0	0	23
CL29	0	0	0	0	0	3	1	1	2	5	3	15
CL17	2	0	0	**5**	**36**	0	0	0	0	0	0	43
CL14	1	**18**	**4**	**6**	**27**	3	0	0	0	3	0	62
CL23	0	0	0	0	0	1	**11**	**12**	2	0	0	26
CL32	0	2	0	1	**19**	2	0	0	0	0	0	24
CL35	**9**	1	0	1	**5**	0	0	0	0	0	0	16
CL26	0	0	0	0	1	0	2	1	1	0	0	5
Total	15	23	5	16	108	81	23	25	29	49	8	382

There is a stronger connection between income clusters and provinces. Indeed, clusters 19, 17, 14, 32 and 36 are dominated by Quebec; all except cluster 14 have in common their low labour force participation rates, and even cluster 14 only has an average value for this variable. Ontario, Alberta and BC feature

prominently in the high income cluster, cluster 16, and also in cluster 13 (where wages and labour force participation rates are high, but the working age population is low). Four out of the 5 PEI SRs are in cluster 14 (together with SRs in Nova Scotia, and Quebec) where low wages combine with average labour force participation rates. Cluster 23 - low earned income, high dependency and high labour force participation rates - is constituted principally of SRs in Saskatchewan and Manitoba which have suffered some of the heaviest job losses in Canada (see maps 2 and 6). Finally, nine of Newfoundland's 15 SRs are in cluster 35, where low wages and low labour force participation rates - despite combining with a low dependency rate - lead to low per capita incomes.

Map 8 illustrates the geographic distribution of clusters across Canada. The distribution of cluster 14 - low wage and average labour force participation rate SRs - is of particular interest since it stretches from southern Montreal to Nova Scotia along the border with the USA. In Quebec this area corresponds to the central peripheral areas close to Quebec and Montreal. These can be contrasted with areas on the north shore and in Gaspésie (in clusters 17 and 32) where income per worker is higher but labour force participation rates significantly lower. This is underscores the analysis in section 4 where it was pointed out that in many - but not all - cases incomes are lower in central than in peripheral areas.

Both of Quebec's metropolitan areas, Montreal and Quebec city, are in cluster 19, as are many other urban areas in Quebec (Rimouski, Sept-Iles, Val d'Or, Trois Rivières, Rouyn...). Cluster 19 is a high wage, low dependency and low labour force participation rate group (the labour force participation rate, at 69% is fourth lowest amongst the thirteen clusters). This is in sharp contrast with most other Canadian urban areas which are in clusters 16, 13 or 24, all of which have high labour force participation rates (above 77%).

The principal difference between Quebec urban areas and those in other provinces (in the context of this section's discussion) is their markedly lower labour force participation rates. Low labour force participation rates are a feature

of most Quebec SRs, and of those in northern New Brunswick and Newfoundland (which are mainly in clusters 17 and 35).

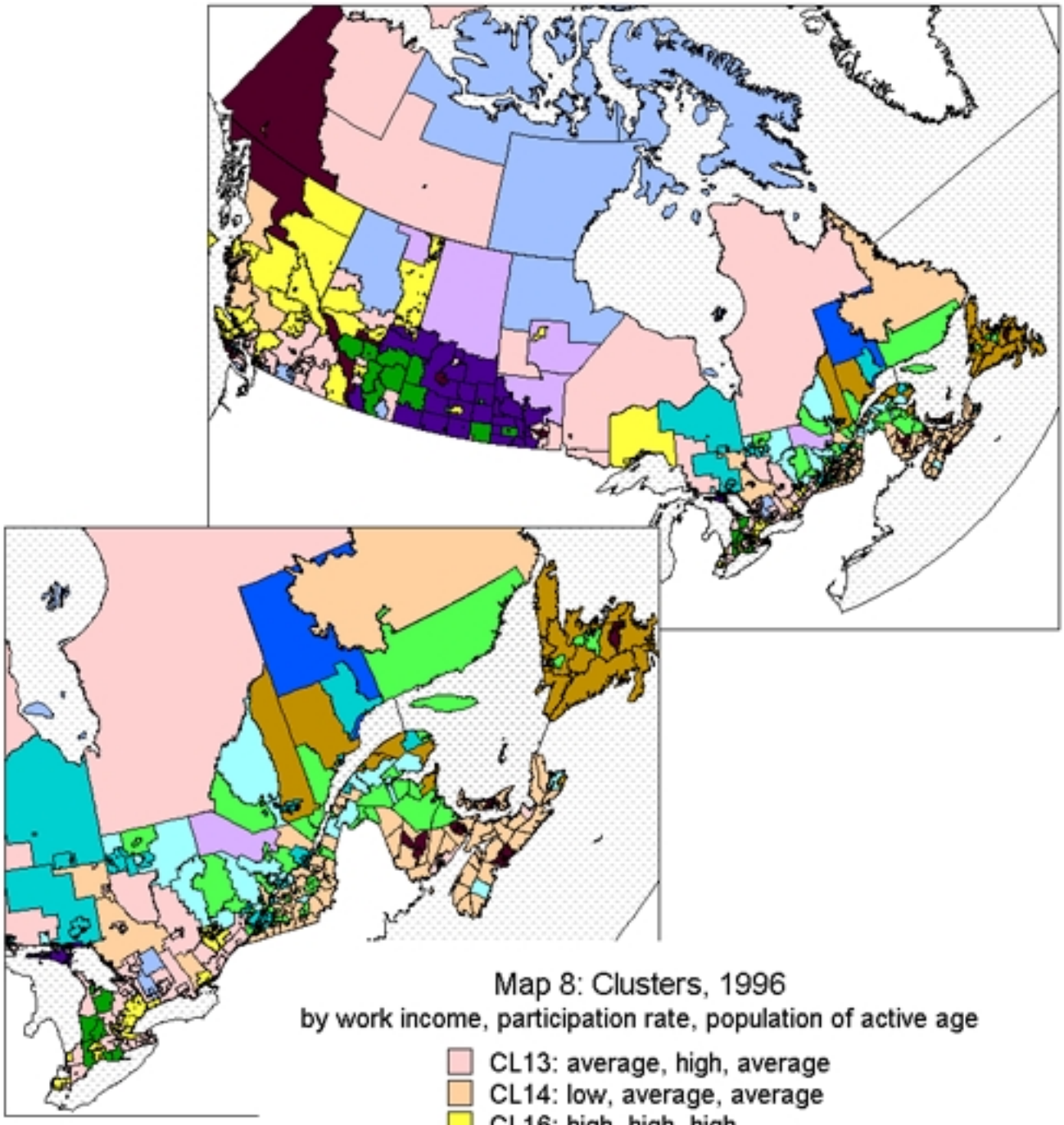
8.2 Conclusion

The decomposition of earned income per capita into its three constituent parts provides some insights into the interaction between demography, labour markets and wages.

It also highlights the fact that provincial - and perhaps therefore cultural - factors are key determinants of the way in which these three variables interplay. Clusters 23 and 35 are in sharp contrast: the former, in the Prairies, displays very high labour force participation rates and low wages. The latter, in Newfoundland and Quebec, combines similar wages with drastically lower labour force participation rates and far higher dependency.

As has already been pointed out in section 4, SUs in Quebec, northern New Brunswick and Newfoundland, stand out as having significantly lower labour force participation rates than other similar areas. It is possible that cultural factors - which reduce the propensity to migrate, are an explanatory factor.

It should be noted that this analysis reveals some of the limitations of our synthetic regions, and the value of taking an alternative approach: although SRs interact in clearly identifiable ways with clusters based upon industrial structure, and although population and employment trends (as seen in sections 3, 4, 6 and 7) vary in consistent ways across SRs, these regions bear less relation to income and labour force participation rates than do provincial boundaries.



Map 8: Clusters, 1996

by work income, participation rate, population of active age

- CL13: average, high, average
- CL14: low, average, average
- CL16: high, high, high
- CL17: average, low, high
- CL19: high, low, high
- CL22: high, high, high
- CL23: low, high, low
- CL24: average, high, high
- CL26: low, low, low
- CL29: average, average, low
- CL32: average, low, average
- CL33: average, high, low
- CL35: low, low, high

9- Multivariate analyses of growth indicators

In this final section of part III the way in which the various systems of geographic classification interact will be briefly examined. It has been seen that there is a link between industrial profile, synthetic regions and provinces, and in the context of this report emphasis has been put upon SRs to structure the analysis. However, it is reasonable to wonder whether a comparison of employment growth across clusters or across provinces would not have revealed results just as convincing which may account for observed variations across SRs. If this is the case, then it could be argued that synthetic regions are in fact less useful analytical tools than these other systems of classification.

The central question addressed in this section is not whether and how variables vary across provinces and across clusters based on industrial profiles: we know from the previous sections, from the growth decomposition analysis (section 4), and from published sources that they do. Rather, it is to verify – for a small number of key variables – that synthetic regions add significantly to our understanding of their variation.

In order to investigate the relevance of SRs, analysis of variance (ANOVA) has been performed. The ANOVA technique enables one to measure whether an effect (in this case a classification system of Canadian SUs) can explain the variation of a variable under consideration after controlling for other effects. In the tables presented below, the higher the value of F, the more significant the effect. The Pr > F column indicates the probability that the variable does not significantly vary across the effect: the smaller the value, the higher the probability that variations over the effect are significant.

Three variables will be analysed in this way: employment growth between 1981 and 1996, earned income by worker in 1996 and labour force participation rates in 1996.

9.1 Employment growth, 1981-1996

Table 21 summarises the results of an ANOVA analysis of employment growth between 1981 and 1996 with three effects: provinces, synthetic regions and the 1981 clusters based upon the profile of the entire economy.

Table 21: ANOVA analysis of employment growth, 1981-1996

Model	R2	F Value	Pr > F			
	0,42	7,37	<,0001			
Effects	Name	DF	Type II SS	Mean Square	F Value	Pr > F
	province	10	2,85	0,29	6,96	<,0001
	SR	11	1,73	0,16	3,84	<,0001
	cluster81	13	3,24	0,25	6,08	<,0001

This analysis confirms that all three methods of classifying the 382 geographic units in Canada have independent explanatory value for employment growth. This is particularly interesting since we have seen that there is overlap between synthetic regions and clusters based upon industrial profile. In other words, these results confirm that, over and above the well documented provincial variations in employment growth, and despite the clear influence of industrial structure, employment growth over the 1981 to 1996 period varied significantly across the dimensions of centre/periphery and city size. Although the results will not be presented here, regression analysis confirms that after controlling for provincial effects employment growth between 1981 and 1996 varies across the synthetic regions in much the same way as described in sections 2 and 3.

9.2 Earned income by worker, 1996

A similar analysis has been performed comparing earned income across the various systems of geographic classification. The provincial and synthetic region classifications both explain a considerable proportion of the variance in earned income across the 382 Canadian spatial units. Industrial structure explains a significant, though substantially smaller proportion. However, the close link between industrial structure and synthetic regions may account for the lower proportion of variance which it explains.

Table 22: ANOVA analysis of earned income per worker, 1996

Model	R2	F Value	Pr > F			
	0,62	16,67	<.0001			
Effects	Name	DF	Type II SS	Mean Square	F Value	Pr > F
	province	10	1440624165	144062417	22,13	<.0001
	SR	11	810286768	73662433	11,32	<.0001
	cluster96	13	281003147	21615627	3,32	<.0001

9.3 Labour force participation rates, 1996

Table 23 confirms the detailed analyses in the previous sections: labour force participation rates vary far more markedly across provinces than they do across either synthetic regions or clusters based upon industrial profiles. The classification which has the least explanatory value is that based upon synthetic regions. This confirms the analysis in section 7 where we concluded that there was no identifiable link between SRs and income clusters, but that a clear link existed between provinces and income clusters. Despite the lower significance of the SR effect, it remains significant at the 99,9% level.

Table 23: ANOVA analysis of labour force participation rates, 1996

Model	R2	F Value	Pr > F			
	0,60	15,51	<,0001			
Effects	Source	DF	Type II SS	Mean Square	F Value	Pr > F
	province	10	0,68	0,07	23,51	<,0001
	SR	11	0,10	0,01	2,98	0,0008
	cluster96	13	0,14	0,01	3,66	<,0001

9.4 Conclusion

The purpose of this section has not been to present any further descriptive statistics but merely to provide an indication of the robustness of the conclusions which have been drawn in the previous sections. The ANOVA analyses indicate that for employment growth and incomes the classification of spatial units into synthetic regions is a useful tool: even after controlling for other systems of classification, it contributes significantly to explaining the different values of the chosen variables across space. More generally, results from the previous

sections indicate that this is true for the analysis of most variables linked to employment (whether growth rates, location quotients or clustering).

Synthetic regions do not add much to the explanation of the variation of labour force participation rates over space, though they do remain a statistically significant effect.

These ANOVA analyses also emphasise the significant variation observed for all three variables across provinces. Indeed most variables studied in this report vary significantly across provinces. Provinces - whether for cultural, geographic, industrial or other reasons - are closely related to variations in many economic and social indicators, and are one of the principle background determinants of employment growth in most sectors (Coffey & Shearmur, 1998). Thus, whilst synthetic regions are a powerful tool which enable us to gain some insight into the particularities of peripheral and other regions, variation also exists across other important dimensions which have not been fully analysed in this report.

The fact that synthetic regions are significant - often highly so - in explaining the variation of economic and social factors across the 382 Canadian spatial units justifies our focus upon this dimension.

10. Conclusions

Long term trend towards the metropolisation of economic activity

Whilst considerable detail has been presented in this report, the general conclusions are straightforward. There appears to be a systematic tendency for employment to concentrate in and around large metropolitan areas. The only peripheral areas which are showing reasonable levels of growth are some of the larger urban areas which are themselves regional centres. Especially over the 1981 to 1996 period, metropolisation is identifiable in the west as well as the east; though certain peripheral areas in western Canada are growing faster than eastern ones, the western metropolitan areas are growing faster still.

Population more mobile in some areas (Saskatchewan and Manitoba) than others (Quebec, northern New Brunswick, Newfoundland)

The patterns of population growth and decline do not follow the same pattern as employment. In some areas, most notably Saskatchewan and Manitoba, population loss has paralleled employment loss, leading to the somewhat paradoxical situation that Canadian areas with the poorest employment growth over the 25 year period currently have some of the highest labour force participation rates. In other areas, particularly Quebec, northern New Brunswick and Newfoundland, similar employment decline has not been accompanied by commensurate population decline: this lack of propensity to migrate has led to very low rates of labour force participation.

Economic trends impact different peripheral populations differently

There are thus two different logics at work: the metropolisation of economic activity, which is observed across Canada; and the rate of population decline, which is far more closely linked to provincial - and we suspect to cultural - factors. In other words, the problems faced by peripheral areas differ between peripheral areas, but not because the economic trends are dissimilar: the differences are due to the characteristics of populations subjected to these trends and to differences in provincial (and local) policies.

Relatively high (and rising) incomes in peripheral areas; signs of polarisation within metropolitan areas.

Another important conclusion is the fact that there is - in general - no major income problem in peripheral areas. Perhaps because the unemployed tend to migrate towards metropolitan areas, and because high wages are paid to many of those in work, earned income per worker (or wages) are actually higher in some peripheral urban areas than in central ones. In addition, there is every indication that the transfer system is redistributing income from the wealthier to the poorer areas, and that this redistributive function has increased between 1971 and 1996.

A corollary of this remark is that a contrasted socio-economic picture emerges in metropolitan areas: high *and* low education levels are observed there, and labour force participation rates have dropped markedly since 1981. In other words, high average incomes and education levels mask large disparities within metropolitan areas: these disparities may be due, in part, to difficulties encountered by inward migrants (whether internal or international).

Peripheral areas are not low cost locations

A consequence of the above remarks is that peripheral areas cannot, in general, be considered low-cost locations. Quite apart from the costs associated with distance (freight, air-travel, time) which we have not covered in this report, high labour cost relative to similar urban areas close to large metropolitan areas is a further cost disincentive for the location of economic activity.

Proximity to US border

The importance of proximity to markets underpins the trend towards metropolisation, but metropolitan areas are not the only markets: with growing cross-border trade, US markets are playing an ever increasing role in Canada's economic geography, a role which was evident in the nineteenth century prior to implementation of the national policy. Although this has not been tested

statistically, it appears from our analysis and from observation of the maps that peripheral areas closer to US markets (southern Nova Scotia and New Brunswick), and indeed rural areas in Quebec and Ontario which benefit from both metropolitan and US proximity, are either growing or stabilising: these areas have not faced employment declines as marked as in Newfoundland, Gaspé, Côte-Nord, the eastern Prairies and other more remote peripheral areas. This hypothesis merits further investigation.

Inertia of the location of economic activity between 1971 and 1996

A theme which runs through this report is the inertia observed with regards to the spatial distribution of most economic sectors. Between 1971 and 1996 the *relative* distribution across space of most sectors has remained unchanged.

This does not mean that regional economies have not substantially evolved: rather, it means that very few regions exhibit trends which differ from those observed for Canada as a whole. For example, it is clear that all regions have undergone rapid tertiarisation of their economies between 1971 and 1996, and that producer services have grown rapidly everywhere: but those regions which in 1971 had a more tertiarised economy tend to have the most tertiarised economies in 1996. Similarly, areas which had most producer services in 1971 have the most producer services in 1996.

This means that areas will tend to grow and decline as the sectors which are located there grow and decline: only in rare circumstances - at least on the basis of our analysis - will an area grow because it has been able to significantly modify its economic base. In other words, if employment is declining in primary and low value added manufacturing sectors, and if peripheral regions specialise in these sectors, then it is highly probable that peripheral regions will decline.

This inertia is evident even if a narrow range of primary and low value added manufacturing industries are analysed: there is minor shifting of economic profiles, but very little evidence of major shifts away from resource based industries towards manufacturing. Policies of diversification which plan to modify the relative economic structure of a region face an uphill struggle. However,

diversification policies which accompany regional economies as they adapt to changing overall economic structures may be more viable.

A historical perspective

The trends which have been described in this report are not new. Decline in peripheral and rural areas has been occurring in Europe since the industrial revolution, and the trend towards metropolisation has been evident for the last 200 years. One of the principal differences between Europe and Canada is the resource orientation of Canada's economy: much of Canada's spatial development has been conditioned by the availability of resources to extract and markets to sell them on (Pomfret, 1981). Expanding demand and apparently infinite supply led to settlement and development in peripheral areas up to the late 1970's. Just as the nineteenth century combination of technology and new sources of supply led to the contraction of European agriculture, so, we would argue, current improvements in efficiency coupled with new sources of supply and the depletion of certain resources are combining to subject Canadian peripheral regions to the trends described in this report. In our view therefore, a central question is not so much the *development* in peripheral areas, but rather the *management of decline*.

This is not to say that peripheral regions will not continue to serve a central function in the economy, since their resources - particularly wood and sea products in eastern Canada - will continue to be in demand. However, as this demand is increasingly met by fewer employees, so the critical mass of economic activity necessary to justify viable serviced communities becomes more difficult to sustain. A similar dynamic has been evident in European agricultural communities, where many small villages have either died or - if close to urban areas - have become gentrified.

This interpretation will be more fully developed in the final report.

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End note: The use of statistics

It should be emphasised that our conclusions are drawn from a statistical analysis: it is the nature of statistics that exceptions to the trends can and will exist. This report should not therefore be construed as suggesting that no peripheral region can change its economic base, or that decline is inevitable in all non-metropolitan locations. But in the same way, no single exception and no small number of examples can invalidate the broad conclusions drawn here. It is by confronting these general trends with particular cases, and by complementing particular examples with general analysis, that a better understanding of the processes at work can be obtained. This report should thus be seen as a complement to the reports by Coté, Desjardins, Johnson and Proulx which focus on specific regions.

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ANNEXES

Annex 1: Definition of CMA and CA

Census Metropolitan Area (CMA)
A census metropolitan area (CMA) is a very large ***urban area*** (known as the ***urban core***) together with adjacent urban and rural areas (known as ***urban and rural fringes***) that have a high degree of social and economic integration with the urban core. A CMA has an urban core population of at least 100,000, based on the previous census. Once an area becomes a CMA, it is retained as a CMA even if the population of its urban core declines below 100,000. All CMAs are subdivided into ***census tracts***. A CMA may be consolidated with adjacent ***census agglomerations*** (CAs) if they are socially and economically integrated. This new grouping is known as a ***consolidated CMA*** and the component CMA and CA(s) are known as the ***primary census metropolitan area*** *(PCMA)* and ***primary census agglomeration(s)*** *[PCA(*s)]. A CMA may not be consolidated with another CMA.

Census Agglomeration (CA)
A census agglomeration (CA) is a large ***urban area*** (known as the ***urban core***) together with adjacent urban and rural areas (known as ***urban and rural fringes***) that have a high degree of social and economic integration with the urban core. A CA has an urban core population of at least 10,000, based on the previous census. However, if the population of the urban core of a CA declines below 10,000, the CA is retired. Once a CA attains an urban core population of at least 100,000, based on the previous census, it is eligible to become a CMA. CAs that have urban cores of at least 50,000, based on the previous census, are subdivided into ***census tracts***. Census tracts are maintained for CAs even if the population of the urban cores subsequently fall below 50,000. A CA may be consolidated with adjacent CAs if they are socially and economically integrated. This new grouping is called a ***consolidated CA*** and the component CAs are called ***primary census agglomerations*** *(PCAs)*.

***ANNEX 2*: 142 sectors,18 sectors aggregation: Canadian employment, 1971 - 1996**

18 sector aggregation		sector	1971	1981	1991	1996
primary	1	agriculture	238,607	457,648	483,283	433,605
primary	2	forestry	62,519	78,157	76,582	66,820
primary	3	hunting and fishing	23,953	31,915	34,216	33,560
primary	4	metallic mines	63,799	74,151	49,723	40,875
primary	5	coal mines	8,422	11,569	11,568	9,540
primary	6	petrol and natural gas	19,455	47,369	52,895	41,205
primary	7	non metallic minerals	21,766	25,676	21,858	18,900
primary	8	oil wells and 'other mining services'	6,767	14,371	33,446	39,075
LVA	9	meat and poultry	36,056	45,793	44,195	48,710
LVA	10	fish processing	27,044	48,384	39,931	25,035
LVA	11	fruit and vegetables	15,985	15,861	14,345	14,595
LVA	12	milk	28,531	26,562	23,976	22,300
LVA	13	mills and animal food	15,936	17,306	13,952	14,230
LVA	14	bread	39,725	42,573	48,247	27,085
LVA	15	other foods	31,801	39,972	41,767	40,040
LVA	16	drinks	30,369	35,617	29,502	24,540
LVA	17	tobacco	8,457	7,808	4,249	4,920
MVA	18	tires, rubber etc…	23,232	27,693	21,212	22,495
MVA	19	plastics	18,855	36,080	46,196	55,560
LVA	20	shoes, leather etc…	26,329	29,176	15,005	12,745
LVA	21	carpets	5,132	7,132	4,690	3,845
LVA	22	various textiles	59,090	66,325	44,837	44,665
LVA	23	clothing	104,032	130,433	101,425	93,890
LVA	24	wood transformation	92,472	135,436	108,650	133,085
MVA	25	furniture	41,267	63,314	59,209	52,480
LVA	26	paper	115,804	138,433	119,773	104,905
communication	27	printing	97,683	126,622	153,425	159,730
LVA	28	metal transformation	104,398	122,587	100,924	85,545
LVA	29	metal products	126,441	176,985	135,688	153,260
MVA	30	machines	59,378	93,868	67,106	79,735
HVA	31	business machines	14,195	20,294	21,687	18,665
HVA	32	aeronautics	23,965	37,387	42,080	38,270
MVA	33	cars	51,613	50,380	68,353	57,225
MVA	34	truck bodies	12,655	16,797	11,853	16,115
MVA	35	car parts	34,592	52,164	57,437	95,835
MVA	36	rolling stock	8,273	12,130	7,270	8,970
MVA	37	ships and vessels	16,521	22,236	17,717	13,230
MVA	38	other transport equipment	5,229	2,821	2,289	5,780
MVA	39	small electical products	7,527	7,680	4,188	3,060
MVA	40	large electrical products	9,496	10,407	6,796	6,735
MVA	41	lighting products	4,138	4,769	4,010	5,660
MVA	42	radios and televisions	6,253	4,033	3,566	2,385

HVA	43	telecommunications equipmentand micro-electronics	42,671	49,126	44,439	58,775
MVA	44	industrial electrical equipment	21,453	26,543	18,147	16,855
MVA	45	electrical wires and cables	6,911	8,484	7,931	6,260
MVA	46	other electrical products	11,472	15,717	9,660	7,870
LVA	47	non metallic mineral products	52,553	64,790	51,217	48,240
LVA	48	oil and coal products	19,132	25,574	16,778	14,550
LVA	49	fertilisers	2,951	2,561	2,564	6,120
LVA	50	plastics and resins	4,325	6,661	9,752	7,050
HVA	51	pharmaceutical products	13,362	15,925	21,829	22,625
LVA	52	paint and varnish	8,029	7,808	6,874	7,060
LVA	53	soap and cleaning products	5,464	6,081	7,550	7,045
MVA	54	personal hygiene products	5,390	7,403	7,619	6,245
LVA	55	industrial chemical products	21,907	32,260	19,310	18,805
LVA	56	other chemical products	14,037	17,199	20,911	14,930
HVA	57	professional and scientific equipment	19,671	27,316	26,950	22,230
MVA	58	other manufacturing	38,361	50,566	52,090	64,730
construction	59	construction	482,650	663,797	735,733	668,285
transports	60	air transport	28,393	51,181	60,107	57,185
transports	61	services auxiliary to air transport	4,976	9,740	13,849	15,875
transports	62	rail transport	106,392	104,957	65,012	48,745
transports	63	maritime transport	21,171	22,253	17,832	16,695
transports	64	services to maritime transport	13,085	11,646	12,847	10,955
transports	65	trucking, removal and storage services	103,380	143,553	166,803	198,055
transports	66	urban transport and inter-urban coach transport	27,655	41,181	49,024	83,265
transports	67	taxis and other transport	34,460	54,300	70,618	36,505
transports	68	road maintenance	38,524	55,423	73,235	44,995
transports	69	services auxiliary to transport	4,544	6,376	9,257	8,120
transports	70	warehousing	15,365	20,606	18,363	18,810
communication	71	radio and televison broadcasting	23,399	41,506	56,907	49,950
communication	72	telephone services	73,915	114,405	122,571	109,560
communication	73	telepgraph services	6,672	7,362	973	3,285
communication	74	postal services	52,974	74,489	75,215	120,395
LVA	75	electricity	61,403	90,942	104,490	83,845
LVA	76	gas distribution	9,940	13,991	15,183	16,750
LVA	77	water distribution	6,415	8,754	6,706	9,665
LVA	78	other public utilities	6,880	11,958	18,190	23,770
wholesale	79	food wholesale	39,953	56,501	72,729	74,880
wholesale	80	ironmongery - wholesale	16,015	22,416	25,375	27,510
wholesale	81	other wholesale	273,337	443,284	445,062	611,710
retail	82	food retail	175,527	253,158	348,341	378,890
retail	83	various merchandise retail	217,387	274,215	228,802	185,585
retail	84	tire retail	20,299	38,798	46,933	47,040
retail	85	gas stations	69,478	76,054	91,787	72,950
retail	86	car dealers	63,121	90,634	102,187	122,280
retail	87	car maintenance and repair	57,725	91,064	119,001	128,795

retail	88	shoe shops	13,682	18,141	21,210	18,495
retail	89	men's wear shops	15,712	19,449	19,839	13,585
retail	90	women's wear shops	26,712	43,660	52,978	48,675
retail	91	clothing shops	19,759	34,725	51,815	60,230
retail	92	ironmongers	20,057	28,893	43,525	37,485
retail	93	furniture shops	34,782	61,538	81,017	53,690
retail	94	electrical repair shops	8,765	10,226	12,646	37,560
retail	95	pharmacies	36,419	51,961	83,696	90,080
retail	96	bookshops and stationers	7,538	14,622	25,577	24,900
retail	97	florists	7,748	13,487	16,274	25,000
retail	98	jewels and jewel repair	12,791	21,812	23,289	19,260
retail	99	spirit (alcohol) shops	12,093	18,230	21,379	20,175
retail	100	tobacco and other shops	46,427	128,200	174,299	219,935
FIRE	101	banks	128,053	244,808	299,840	272,190
FIRE	102	other credit organisations	16,814	18,867	20,096	18,610
FIRE	103	stock brokers	13,811	21,474	27,302	39,075
FIRE	104	investment companies	19,527	20,417	22,604	34,505
FIRE	105	insurance	68,328	98,414	153,783	128,530
FIRE	106	insurance and real estate agents	67,964	111,266	147,597	153,350
FIRE	107	real estate managers	30,191	79,398	77,911	93,750
education	108	day care and establishments for annex care	81,343	212,487	355,609	476,805
education	109	primary and secondary schools	400,803	500,298	610,263	616,825
education	110	art, professional, and non-university post secondary	39,735	67,384	90,630	113,450
education	111	universities and colleges	93,286	127,921	155,563	155,660
education	112	libraries	13,966	24,941	33,646	32,940
education	113	teaching and related services	2,294	3,414	7,074	23,920
health and social security	114	hospitals	344,883	459,545	536,614	487,555
health and social security	115	doctors, surgeons and dentists	56,923	98,700	140,386	159,690
health and social security	116	para-medical practitioners	7,629	15,437	37,107	55,715
health and social security	117	diagnostic services	6,501	16,780	70,246	22,400
health and social security	118	other health related services	5,856	11,840	20,901	116,345
entertainment	119	cultural organisations	46,545	59,420	61,283	98,210
entertainment	120	cinemas	9,328	10,589	8,044	9,030
entertainment	121	film production and distribution	4,308	7,424	21,205	33,160
entertainment	122	entertainment, leisure, golf, billiards, bowling…	45,873	78,955	111,433	158,850
entertainment	123	theatres and shows	7,405	16,861	28,329	31,925
other services	124	temping agencies	8,649	20,903	37,369	52,435
High-tech producer services	125	computer services	4,454	30,280	97,567	133,115
other services	126	security, investigations, and other business services	45,796	107,913	163,220	158,325
professional services	127	accounting	30,338	56,593	85,649	97,770
professional services	128	marketing and advertising	13,663	24,111	51,853	67,780
High-tech producer services	129	architects and engineering consultants	53,522	112,505	158,885	164,370
professional services	130	legal	36,900	71,586	106,606	106,270
High-tech producer services	131	management consultants	4,941	25,285	41,645	82,070
other services	132	personal services	167,167	165,963	262,064	270,725

hotels, restaurants etc.	133	hotels and motels	99,910	155,979	145,417	148,670
hotels, restaurants etc.	134	boarding houses	12,373	2,946	6,489	4,175
hotels, restaurants etc.	135	camp sites	5,517	8,669	15,292	13,320
hotels, restaurants etc.	136	restaurants	181,031	400,769	595,446	686,485
other services	137	other services	109,001	224,116	292,927	364,705
civil service	138	federal administration	317,104	365,518	407,215	341,330
civil service	139	provincial administration	155,713	244,895	292,495	223,795
civil service	140	local administration	140,537	219,029	313,690	248,305
civil service	141	foreign governments	2,160	1,555	1,888	1,820
undefined	142	unclassified	261,044	245,002	329,038	397,355

ANNEX 3: 18 sectors aggregation: Canadian employment and growth rates

	1971	1981	1991	1996	71 - 81	81 - 91	91 - 96	81 - 96
primary	445,287	740,857	763,572	683,580	66%	3%	-10%	-8%
LVA	1,080,637	1,374,963	1,170,680	1,111,225	27%	-15%	-5%	-19%
MVA	382,616	513,084	472,652	527,225	34%	-8%	12%	3%
HVA	113,864	150,049	156,985	160,565	32%	5%	2%	7%
construction	482,650	663,797	735,733	668,285	38%	11%	-9%	1%
transport	397,945	521,217	556,948	539,205	31%	7%	-3%	3%
communication and printing	254,643	364,384	409,091	442,920	43%	12%	8%	22%
high tech services	62,917	168,070	298,097	379,555	167%	77%	27%	126%
wholesale	329,305	522,201	543,167	714,100	59%	4%	31%	37%
retail	866,022	1,288,865	1,564,593	1,604,610	49%	21%	3%	24%
other services	330,613	518,894	755,580	846,190	57%	46%	12%	63%
hotels, boarding, camping, restaurants	298,831	568,363	762,644	852,650	90%	34%	12%	50%
entertainment	113,459	173,250	230,293	331,175	53%	33%	44%	91%
FIRE	344,689	594,645	749,132	740,010	73%	26%	-1%	24%
professional services	80,901	152,289	244,109	271,820	88%	60%	11%	78%
education	631,426	936,444	1,252,785	1,419,600	48%	34%	13%	52%
health and social security	421,792	602,302	805,254	841,705	43%	34%	5%	40%
civil service	615,514	830,997	1,015,288	815,250	35%	22%	-20%	-2%
non classified	261,044	245,002	329,038	397,355	-6%	34%	21%	62%
CANADA	**7,514,155**	**10,929,671**	**12,815,639**	**13,347,025**	**45%**	**17%**	**4%**	**22%**

ANNEX 4

Figure a4.1: Net migration for the five peripheral regions* in Quebec, 1986-1999

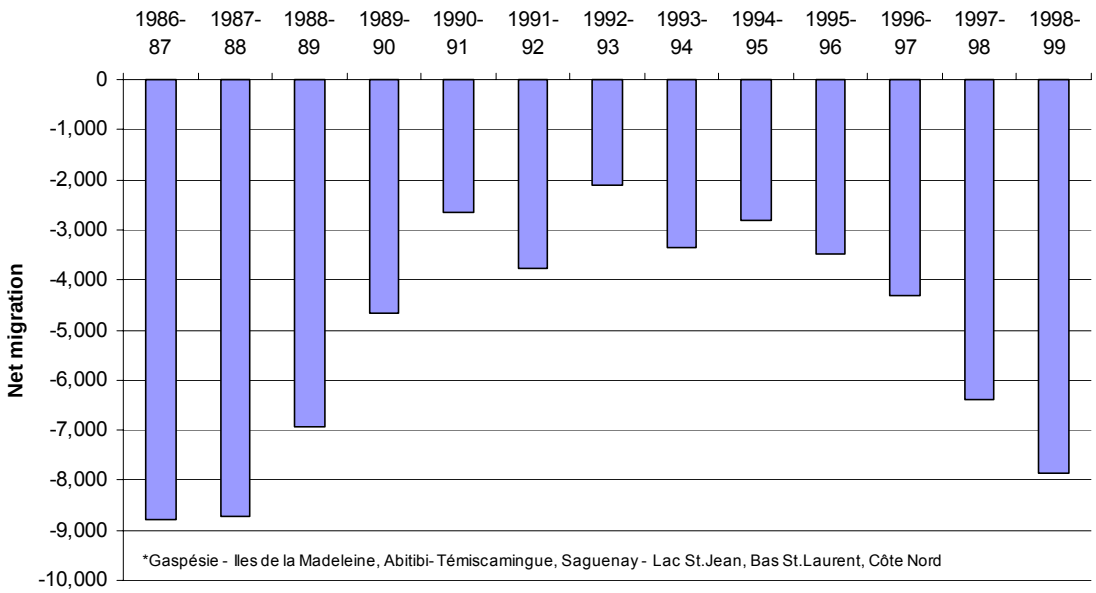
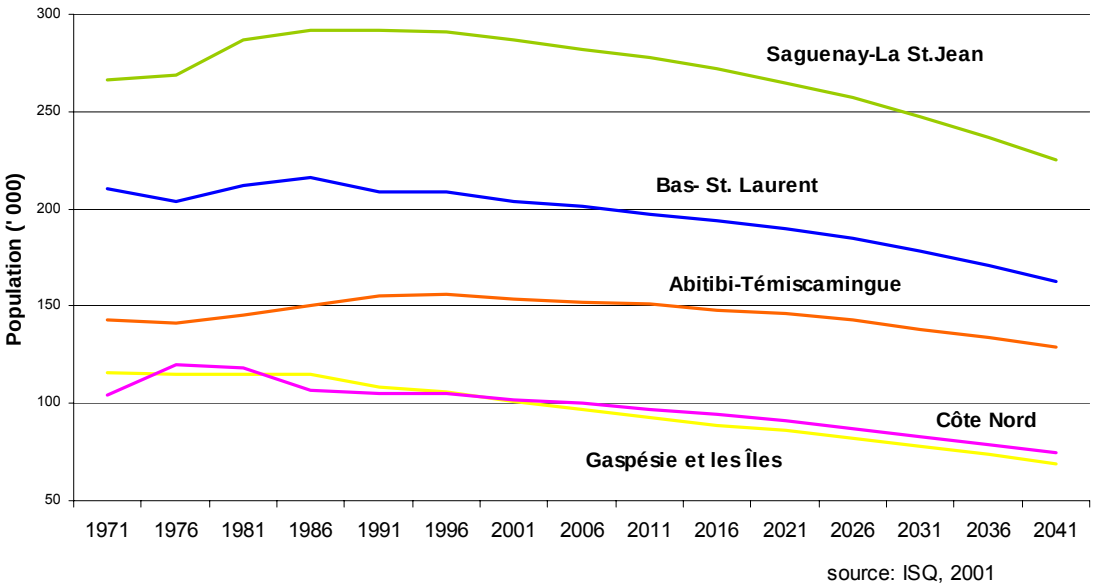


Figure a4.2: Peripheral regions in Quebec
Population 1971-2041: Projections



source: ISQ, 2001

Figure a4.3: Market income (work and investment) per capita
Québec Peripheral Regions 1995-1999
(Montréal = 100%)

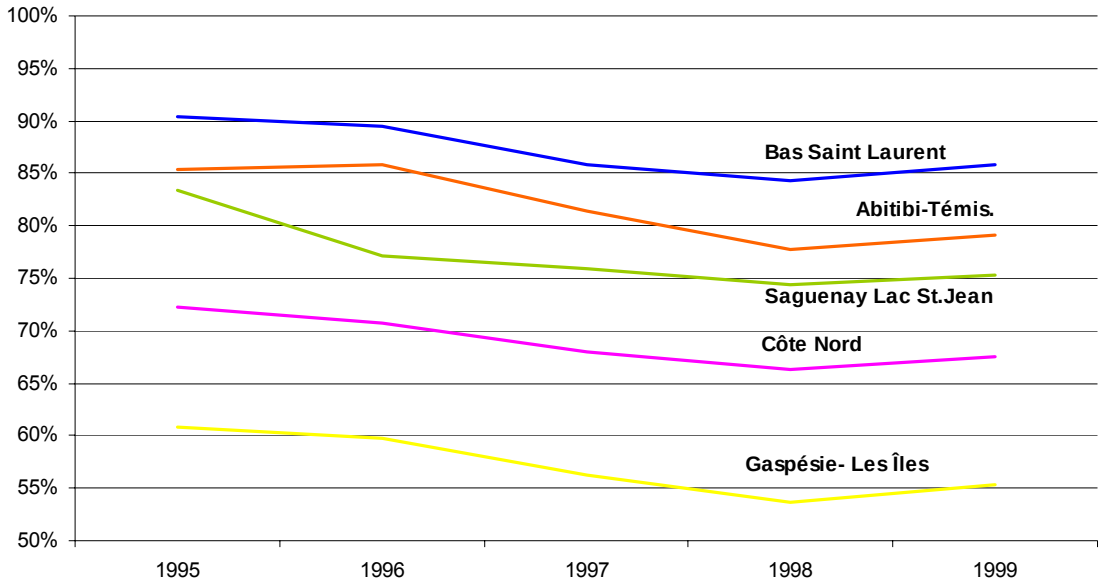


Figure a4.4: Per capita disposal income
Québec peripheral regions 1995-2000
(Montréal =100%)