

# **INTEGRATED DIS-INTEGRATION: EMPLOYMENT STRUCTURE OF FIRST NATIONS COMMUNITIES ON THE PRAIRIES RELATIVE TO THEIR LOCAL REGIONS**

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## **Abstract / Résumé**

An exploratory study of the employment specialization/diversity of Prairie First Nations Communities (FNCs) in relation to the employment structure of five comparative settlement system base profiles that are found within their local regions. The FNCs are classified according to levels of settlement system integration. Findings reveal considerable differences in the employment structures at all levels of settlement system integration; a problem that is summarized as the paradox of integrated dis-integration.

Un étude exploratoire de la specialization de l'emploi par rapport à la diversité des Communautés Autochtones des Prairies en rapport avec les structures d'emploi de cinq profils bases de systèmes d'établissement comparatifs qui sont trouver dans leur propres régions. Les Communautés Autochtones sont classés selon des niveaux d'intégration de système d'établissement. Les résultats révèlent des differences considérables dans les structures d'emploi à tous les niveaux d' intégration des systèmes d'établissement; une problème qui est resumé dans le paradox de desintégration integrée.

## 1. Introduction

This paper explores the employment structure of residents of First Nations Communities (FNCs) on the Canadian prairies and the way in which their employment profiles are indicative of economic diversity or specialization in relation to the employment profiles of rural areas and a variety of small settlements within their local regions. The paper is not specifically concerned to address contemporary FNC development concerns or the role of local economic development initiatives in creating jobs, fostering economic growth, or creating employment diversity, although these issues are inherently linked to the matter of employment diversification and are briefly reviewed. Rather, following the urban systems and settlements systems studies traditions, the aim of this study is to investigate the character and levels of employment diversity of *on-reserve residents* in relation to various components of the settlement system that are found within their immediate hinterlands, including rural areas and small non-Aboriginal settlements. The general premise underlying this work is the need to understand the economic integration, or dis-integration and hence inequalities, of FNCs with their surrounding economies. By adopting a census-based empirical analysis in the regional science tradition, the analysis provides a systematic response to the identified need for additional research on the structure of reserve economies (Peters 2000, 2001).

The paper begins with an overview of key issues surrounding the economic and employment characteristics of FNCs in Canada. This includes issues of economic marginality, unemployment, and the problem of entrenched underdevelopment. We briefly review the prospects for change that may be derived from contemporary Aboriginal economic development initiatives, corporate reorientation towards Aboriginal economic integration, and demographic change. The paper then turns to an empirical study of employment structure, and the spatial variation in employment structure, of *on-reserve* residents. We employ a measure that summarizes the overall degree of employment *specialization* of the individual FNCs across a set of eighteen census-defined industrial categories, although these can be grouped into more broadly defined sets of sectors that represent primary, secondary, tertiary, quaternary, and quinary activities. This index is computed separately for each FNC relative to five different local area base employment profiles (e.g. rural areas, small settlements, etc.), and from this analysis we classify the Aboriginal communities according to which type of employment profile they are most alike—and hence which part of the lower orders of the prairie settlement system they appear most integrated.

We explore the issue of both settlement system integration and em-

ployment dis-integration, which must be understood as operating simultaneously, and attempt to tease out some of the key employment sectors that are linked to these features. The paper therefore highlights the needs to reconsider the view that FNCs are a parallel set of communities that are completely excluded from the Canadian society and economy. It emphasizes that, in spatial-economic terms, the prairie FNCs are characterized by a variety of forms of integrated dis-integration.

## **2. Review**

The contemporary problems of Aboriginal communities are manifest in many ways, and numerous theoretical perspectives have been employed in attempts to understand the sustained patterns of poverty, underemployment, and underdevelopment of First Nations peoples (Wien 1986; Peters and Rosenberg 1995). Yet regardless of theoretical stance, it is widely acknowledged that most of the problems of FNCs are contingent upon the continuing economic and social marginalization of Aboriginal peoples in Canadian society (Peters 2000, 2001; Kendall 2001). High rates of unemployment, a reliance on social assistance as a major source of income, and the lack of on-reserve employment opportunities are key features that distinguish FNCs and peoples from other small Canadian communities (Hagey et al. 1989; George and Kuhn 1994; Choudhury 1997, INAC 2000a). Low levels of human development (measured by education, employment, income, and housing conditions) and a persistent wage gap (Gerber 1990; Bernier 1997; Pendakur and Pendakur 1998, INAC 2000a) are further manifestations of the economic marginality of FNCs, but Armstrong (2001) has shown that these communities vary widely in terms of their levels of socio-economic well-being. He has argued, for instance, that "High Disparity" FNCs, which are predominantly concentrated in the prairies, are representative of communities that are poorly integrated with the surrounding non-Aboriginal society and economy "in mutually beneficial ways" (Armstrong 2001:24). Reserve-to-urban migration has been shown to partially reduce such income inequalities, or perhaps increase the potential for higher levels of integration into the Canadian urban economy, although reserve-to-urban migration is no panacea (Peters 2001). On-reserve or off-reserve, Aboriginals have been, and continue to be, poorly integrated into the Canadian space economy.

It has been argued that this situation has arisen through a legacy of dispossession and dependency, involving the classic features of the 'development of underdevelopment' (Goodman-Draper 1994; Haddad and Spivey 1992; Kendall 2001; Peters 2000,2001). This process, which has resulted in the entrenched underdevelopment of FNCs, has led to a form

of Aboriginal economic participation that is seen to be framed by an ongoing dependency on an agricultural or extractive economy. It has also fostered the creation and maintenance of an internal political-economic elite (*Globe and Mail*, Oct 24, 1998), and a continued reliance on outside social assistance and on a government-business interface to define the paths of FNC economic development (Frideres 1988). Development, as well as Aboriginal employment concerns, can therefore be linked to a long-standing "separation" of FNCs from the non-Aboriginal settlements of Canada, for we have been reminded that the reserve system was historically based on an explicit assumption of the incompatibility of First Nation's people and urban industrial cultures, while some may even suggest the latter is incompatible with authentic 'Aboriginality' (Peters 1996, 2000; Peters and Wolfe-Keddie 1995). Yet others have also shown that the current legacy of dispossession, underdevelopment, and poor articulation of the Aboriginal community with the non-Aboriginal space economy is also a matter of misguided understanding of the cultural mindsets, world views, and work habits of Aboriginal peoples (Lockhart 1982; Troster 1993; Peters and Rosenberg 1995). The outcome has been one in which FNCs are poorly integrated into Canadian society and economy, and particularly the non-Aboriginal settlement system (Bourne 2002; Armstrong 2001; Elias 1997; Haddad and Spivey 1992; Peters 2000; Peters and Rosenberg 1995). The exclusion of on-reserve Aboriginals from the urban social and urban economic fabric of Canada is now seen to be one of the most challenging hurdles in the development of Aboriginal autonomy and Aboriginal economic development. The social and economic development of FNCs, and their full participation in their local, regional, national economies, as well as the global economy beyond, must be based on a bridging of the historical divide between FNCs and the non-Aboriginal settlement system in order to create higher levels of integration or employment equality (diversity) with their local regions (Sixdion Inc. 1997; INAC 1997a; Kendall 2001).

Remoteness and spatial isolation have been cited as key features underlying the social and economic marginalization of Aboriginal communities, and as Troughton has argued, the vast majority of FNCs are embedded within the most peripheral and marginalized form of rural system in Canada (Troughton 1999; Armstrong 2001; Bourne 2002; Davies 1993; Kendall 2001). Spatial proximity to urban places is associated with greater potential for economic well-being, economic development, and the employment diversity of reserve populations. Armstrong's (2001:7) analysis observed the somewhat favourable development potential of FNCs located near urban areas and noted the advantages of urban prox-

imity for integrating with urban labour markets, though he was careful to point out that there is no simple correlation between urban proximity and economic well-being. Nevertheless, urban proximity has not only been linked to more entrepreneurial opportunities for Aboriginal people (Peters and Rosenberg 1995), but also to higher propensities for labour force commuting amongst rural populations, particularly within a 50 km or 30 minute distance from cities (Hodge and Qadeer 1983), although Gagnon (1992) has documented some potentially adverse economic consequences of Aboriginal labour commuting. Given the available evidence, it might be expected that the proximity of reserves to settlements, particularly larger cities within the urban system, will be associated with higher propensities to commute, increased Aboriginal labour force participation, and hence to a greater diversity of employment and occupational profiles of the labour force residing on urban-proximate reserves. Urban proximity may also be associated with greater potential to develop viable Aboriginal and non-Aboriginal business partnerships; and possibly a greater potential for linkage of the reserve economy with the national settlement system and global economy.

The historical and contemporary portrait of Aboriginal economic development, including employment characteristics, is bleak at best. However, a number of factors may signal a new optimism for the future of Aboriginal economic diversity, improved levels of socio-economic well-being, and greater levels of employment diversity and hence integration (Anderson and Bone 1995; Anderson 1997; Aboriginal Business Canada n.d.). One such factor is the growing critical mass of Aboriginals in Canadian society. Aboriginals are the fastest growing minority in Canada—growing at a rate more than three times that of the non-Aboriginal population between 1951 and 2001 (Statistics Canada 2003). A number of contributing factors are responsible for this, including new opportunities for Aboriginal self-identity since the 1985 amendments to the Indian Act (Bill C31), birth rates that are roughly 1.5 times the non-Aboriginal population (Statistics Canada 2003), a significant reduction in Aboriginal infant mortality (Statistics Canada 2003; Hagey et al. 1989b, INAC 2000a), an increase in Aboriginal life expectancy and gradual movement towards life expectancy parity with the Canadian population (INAC 2000a, 2002; Statistics Canada 2003), and a significant decrease in the alarmingly high rates of Aboriginal suicide (Hagey et al. 1989b: 6-7; Health Canada 1994). Demographic aging is another factor that may signal new opportunities for economic participation and Aboriginal employment diversification. Compared to the non-Aboriginal population, which is generally 'aging into retirement' the Aboriginal population is relatively young, and is 'aging into the working age' (Statistics Canada 2003; INAC

2000b; Hagey et al. 1989a:17). Thus the relative size and growing critical mass of the Aboriginal labour force is an important concern for future economic change. This emergent workforce will also be better educated than ever, as significant advances in the educational attainment of Aboriginals have been realized over the last few decades (Tait 1999; INAC 2000a). Such changes are likely to generate greater occupational and industrial diversity amongst the Aboriginal labour force, and the potential for greater entrepreneurial activity.

The study of urban and especially metropolitan Aboriginals in Canada has been highlighted as an essential focus for future research, particularly given that the absolute size of the urban Aboriginal population is expected to increase in the near future as reserve-to-urban migration continues (Peters 2001). Yet it is also important to recognize that the relative growth of the on-reserve population, particularly for Indians, will be an important factor in shaping the future employment character of reserves. For instance, while the proportion of Indians living on reserves decreased from 71% in 1980 to 58% in 2000, it is expected that by 2010 the on-reserve share should increase again to about 65% (INAC 2002). Reserve-to-urban migration, particularly for Registered Indians, is expected to decline in the future (Hagey et al. 1989a), while on-reserve population growth is expected to be higher than off-reserve Aboriginal growth (Hagey et al. 1989a), in part from "reverse" or off-reserve to on-reserve migration (INAC 2000b). These factors will contribute to an increase in the population base and size of the labour force on reserves in the future.

There is also optimism for change in the implementation of new development initiatives (Mackie 1986; Elias 1997; Anderson 1997; Sixdion Inc. 1997; Kendall 2001). The failure of many external 'top down' development approaches, especially those under federal government auspices, has been evident for some time (Davies 1993; INAC 1997). But a new consensus has emerged among Aboriginal groups, government, and corporate Canada—one that recognizes that Aboriginal economic development must be collaborative, bottom-up, and sensitive to Aboriginal cultural values, and that these initiatives must be gauged not necessarily by absolute growth, but by their ability to enhance the community in a holistic way (Gadacz 1991; INAC 1997; Elias 1997). Yet it is also recognized that such comprehensive forms of development must be able to fit within broader objectives of systemic Aboriginal integration into the local, regional, national, and global economy, and hence must respond to employment integration at a variety of spatial and economic scales (Davies 1993; Anderson and Bone 1995). Negotiated joint ventures with corporate Canada and Transnational Corporations (TNCs)

seem to dominate these new approaches, and it has been argued that these are more successful than previous development efforts in terms of creating employment and raising income levels (Anderson 1997). Corporate Canada seems to be onside with such participation: having recognized that FNCs are becoming a substantial economic force in Canada, they now view joint venture participation as both profitable and socially responsible (Anderson 1997). Nevertheless, despite the documented successes in this area (e.g. Anderson 1997; Aboriginal Business Canada n.d.), Haddad and Spivey (1992) have cautioned that "success" must be carefully evaluated in terms of the longer-term social implications and social conflicts stemming from such joint ventures. Generally, however, Aboriginal peoples themselves see joint ventures as the gateway to competition and integration, and ultimately to self-determination and economic self-sufficiency (Sixdion Inc 1997). They are, as Peters (2000: 51) has said, actively attempting to participate in the global capitalist economy. It is also evident that for many First Nations bands, such participation must involve not only defining unique market niches, but the creation of more diverse employment opportunities for reserve residents. Thus diversification of the employment base, which can harness the existing human capital of reserve residents, provide new opportunities for training and education of young Aboriginals, and contribute to reserve-based tax revenues, is one of the main objectives of contemporary FN economic development initiatives (Sixdion Inc. 1997; INAC 1997a).

### **3. Objectives**

The review above has highlighted the fact that employment diversity or integration at a number of scales is essential for the future development of FNCs. It has also pointed to the continuing divide between FNCs and the non-Aboriginal settlement system in Canada, although much of this literature deals with this problem at a macro scale. There have been few if any empirical studies that have addressed the character of FNC employment diversity and integration at a local scale—particularly within the local region of each FNC, although Peters (2000) has drawn attention to the pressing need for further research on reserve economies and labour force characteristics.

The principal objective of this study is to address this problem by exploring the ways in which the employment profiles of prairie FNCs exhibit specialization (difference or dis-integration) or diversity (similarity or integration), relative to their local regions, and particularly to the rural and lower orders of the settlement system within their immediate hinterland. Given the typically small population size and labour force of these communities, a comparison with large, and typically industrially

diverse cities and metropolitan areas, is not warranted. This study is therefore restricted to a comparison with rural areas in addition to settlements (villages, towns, etc.) with an employed labour force of at least 50 and populations of less than 10,000. The study is also limited to prairie FNCs since these represent a relatively distinctive subset or system of FNCs within Canada (Gerber 1984).

It should be noted that this study cannot adequately assess the *functional character* or diversity of reserve economies per se, since it does not measure or classify the specific establishments or businesses based on reserves. Since this study is based on the industrial classification of employed people *living on reserves* (who may be employed both on or off reserve, and in both Aboriginal and non-Aboriginal businesses), it provides only a crude proxy of the true functional character of reserve economies. However, the study does provide a sound basis for measuring the degree of employment diversity or specialization of the *FNC residents*, and for understanding how these employment profiles are different to, or integrated with the labour force characteristics of non-Aboriginal rural areas and settlements within their immediate local regions.

In this discussion, *specialization* is conceived as a *relative* measure that is benchmarked according to a comparative profile at the same point in time (Marshall 1989; O'Donoghue 2000). *Specialization* is therefore a summary measure of the degree to which a given employment profile *deviates from*, is *different to*, or is *dis-integrated* from, a given base profile, regardless of the actual character of the base profile. The flipside of specialization is *diversity*. In this study *diversity* is conceived as a *relative* measure of the degree to which a given employment profile *does not deviate from*, is *similar to*, or is *integrated* with a given base profile, regardless of the actual character of the base profile. If we categorize all employment into a series of different sectors and then compare the overall employment structure or profile of a given FNC with a particular base profile (using the same set of sectors)—a high level of *diversity* would mean that the FNC employment structure was very similar to the base profile, with very similar relative concentrations of employment in the various sectors. A high level of *specialization*, by contrast, would mean that the FNC employment structure deviated substantially from the chosen base profile, and hence would be characterized by very different concentrations of employment in the various sectors, with most employment in one or only a limited number of sectors. Hence one could argue that if a given FNC has an employment structure identical to the comparative base profile, it could be considered to be *just as diverse*, and hence *perfectly integrated* into the base economy—it would be sharing in the different employment sectors in

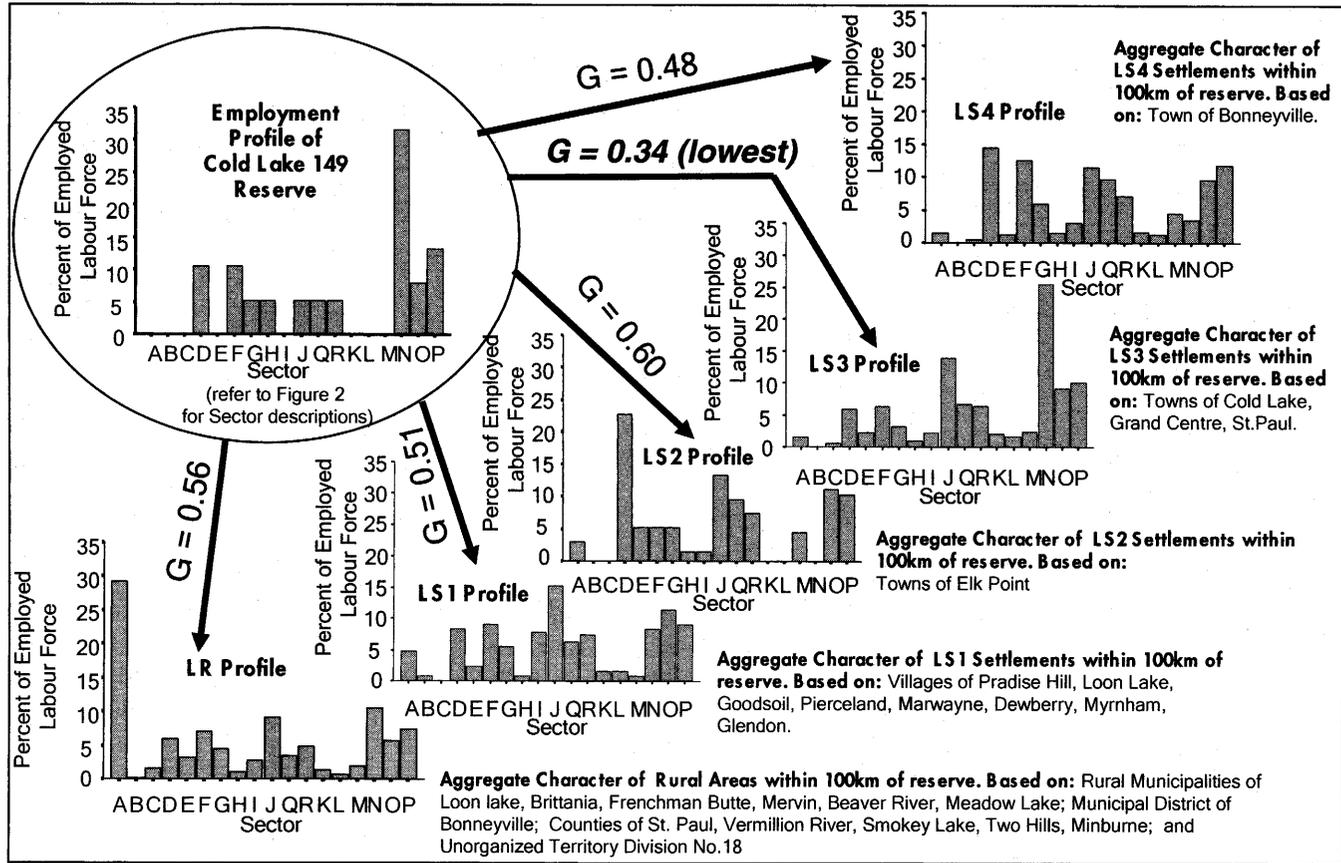
the same proportions as the comparative base labour force. Such a community, whose profile reflects the local base economy, would therefore be in a state of relative *equality* with the comparative economy.

#### 4. Data and Methods

Employment data by industrial division (18 categories) were assembled from the 1996 census for a set of 159 prairie FNCs. These communities included Aboriginal reserves and settlements (census subdivisions) that were completely enumerated, and had a resident employed labour force of 50 or more. Following an integration of the employment data into a GIS (MapInfo), we define, for each FNC, a local region buffer of 100km radius from the geographical centroid of the reserve, and then subsequently identify and aggregate, for example, the employment data for all rural areas (census subdivision polygons) that intersect the 100km buffer. The same procedure was used to aggregate, for each FNC, the employment data for employed residents of a number of different settlements that lie within the immediate hinterland of the FNC. An example of the procedure is shown in Figure 1. In this way matching data was assembled for a series of five FNC-specific base reference economies against which the FNC employment profiles are compared (Table 1). For each FNC, the *relative concentration* of employment in each sector relative to the separate base profiles was computed by means of Location Quotients (LQs). Values of LQs equal 1.0 where the sectoral concentration on the reserve is identical to the base profile, values of 2.0 index twice the relative concentration as the base profile, and so on. While the LQs provide a measure of the relative importance of the specific employment sectors within each FNC compared to the benchmark economy, they do not index the degree of employment specialization or diversification across the set of sectors. The Gini Index of Specialization ( $G_j$ ) is a measure commonly used in urban economic studies to index such levels of diversity / specialization of specific cities and towns relative to the aggregate profile of all cities and towns within an urban system (see O'Donoghue 2000; Marshall 1989; Crowley 1978), but there is no reason why this measure cannot be used to measure the levels of employment diversity / specialization of FNCs relative to various base profiles. It should be noted that  $G_j$  is sensitive to the number of categories used to classify employment—an aggregation effect—and so caution must be exercised when comparing this measure to other studies (see Marshall 1989). Thus  $G_j$  using the systemic base approach (Marshall 1989:113-120), was computed for each FNC for each of the five base profiles. Values of  $G_j$  may range from a low of 0.0 (complete *diversity relative to the base profile*) to a high of 1.0 (complete *specialization relative to the base profile*). It is

Example of FNC Employment Structure vs. Comparative Base Profiles

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**Table 1**  
**Derivation of Five FNC Local Region Comparative Employment Base Profiles**

Base Profile (abbreviation)	Label	Characteristics
LR	Local Rural	Aggregated profile of employed labour force of rural areas (CSDs) with minimum employed labour force of 50 that intersect with 100km radius buffer of individual FNC
LS1	Local Settlement 1	Aggregated profile of employed labour force of residents of settlements (CSDs) of population size < 1000 and minimum employed labour force of 50 that intersect with 100km radius buffer of individual FNC
LS2	Local Settlement 2	Aggregated profile of employed labour force of residents of settlements (CSDs) of population size 1000-2499 and minimum employed labour force of 50 that intersect with 100km radius buffer of individual FNC
LS3	Local Settlement 3	Aggregated profile of labour force of residents of settlements (CSDs) of population size 2500-4999 and minimum employed labour force of 50 that intersect with 100km radius buffer of individual FNC
LS4	Local Settlement 4	Aggregated profile of labour force of residents of settlements (CSDs) of population size 5000-9999 and minimum employed labour force of 50 that intersect with 100km radius buffer of individual FNC

important to emphasize that according to this measure complete diversity or integration does *not* represent equal shares of employment in each of the eighteen employment categories, but a profile that provides a perfect match with the base profile, and hence is not characterized by sectoral over- or under-representation relative to the benchmark characteristics.

Our interest here centres on the extent to which the FNCs are similar to, or integrated with, the employment character of the rural and lower orders of the settlement system within their immediate hinterland—and essentially which part of this settlement hierarchy the FNCs *best fit* in terms of employment integration. Given that for each FNC five comparisons are made, we are interested in which of the five measures has the

lowest  $G_j$  value—meaning the most diversified and hence most similar to the chosen profile. We therefore classify each FNC according to its lowest value of  $G_j$ , thereby grouping the communities that are most similar to the employment structure of their rural hinterland, most similar to the employment structure of LS1 settlements within their immediate hinterland, most similar to LS2 settlements within their immediate hinterland, and so on (see Table 1). Figure 1 provides an example of the classification of the Cold Lake 149 reserve as being more integrated with the LS3 settlement characteristics than any of the other four comparative base profiles, and how the lowest value of  $G_j$  captures the highest level of similarity in the employment profiles.

Having classified the communities in terms of diversity, we then analyze the mean LQs for each of the eighteen industrial sectors. This analysis enables us to profile the employment characteristics of the FNCs that lie behind the classification—the features that account for the similarities—as well as the typical features of reserve employment that represent important departures from, or sources of dis-integration from, the profiles to which they are considered most similar.

## 5. Results and Discussion

In the following discussion, we address the typical or average features associated with the classification, but space limitations mean we cannot address the specific character of individual communities nor the detailed variations that are found amongst communities within each group. An analysis of the local FNC employment concentrations (LQs) by sector, which are grouped according to five broadly defined categories that define primary, secondary, tertiary, quaternary and quinary employment categories (Davies and Donoghue 1993), reveals a number of features of FNC employment that generally account for the observed levels of dis-integration or deviation from the non-Aboriginal rural profiles. Although it must be cautioned that each FNC will vary from its most similar employment profile in unique ways, we focus here on some general trends. For ease of interpretation, the mean LQs have also been grouped as follows:

- i) sectoral non-participation by FNC residents;
- ii) sectoral under-representation in the FNC employment profile ( $LQ < 0.5$ );
- iii) similar concentrations as the base profile ( $0.5 < LQ < 1.5$ ); and
- iv) sectoral overrepresentation relative to the base profile ( $LQ > 1.5$ ).

This simple rubric (Figure 2) provides a useful summary of the main trends for each of the separate groups of FNCs and facilitates a com-

**Figure 2**  
**Summary Characteristics of FNC Sectoral Concentrations by Most Similar Base Profile**

	Primary Sectors					Secondary Sectors					Tertiary Sectors					Quaternary Sectors					Quinary Sectors									
	Closest Base Profile					Closest Base Profile					Closest Base Profile					Closest Base Profile					Closest Base Profile									
Average LQs for FNCs by Closest Base Profile	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base	LR Base	LS1 Base	LS2 Base	LS3 Base	LS4 Base
<i>(i) Non-Participation by FNC residents</i>			C		B						I			I	G	K				L	K									
<i>(ii) Main Employment Deficits (underrepresentation) by FNC residents (LQ &lt; 0.5)</i>	A	A	B	B	D	E	E		E	E	Q	I	J	I	J	L	K		K	L										
<i>(iii) Relatively Similar Concentrations (0.5 &lt; LQ &lt; 1.5)</i>	B	B	A	A			F	E			G	G	G	H	H	M	M										P	P	P	P
<i>(iv) Main Employment Surplus (overrepresentation) by FNC residents (LQ. 1.5)</i>				C	A	F			F	F	H				G						N	O				N	O	O	O	

**KEY:**

**Primary Sector Industries**

- A: Agricultural and related service industries
- B: Fishing and trapping industries
- C: Logging and forestry industries
- D: Mining (including milling), quarrying and oil well industries

**Secondary Sector Industries**

- E: Manufacturing industries
- F: Construction Industries

**Tertiary Sector Industries**

- G: Transportation and storage industries
- H: Communication and other utility industries
- I: Wholesale trade industries
- J: Retail trade industries
- Q: Accommodation, food and beverage service industries
- R: Other service industries

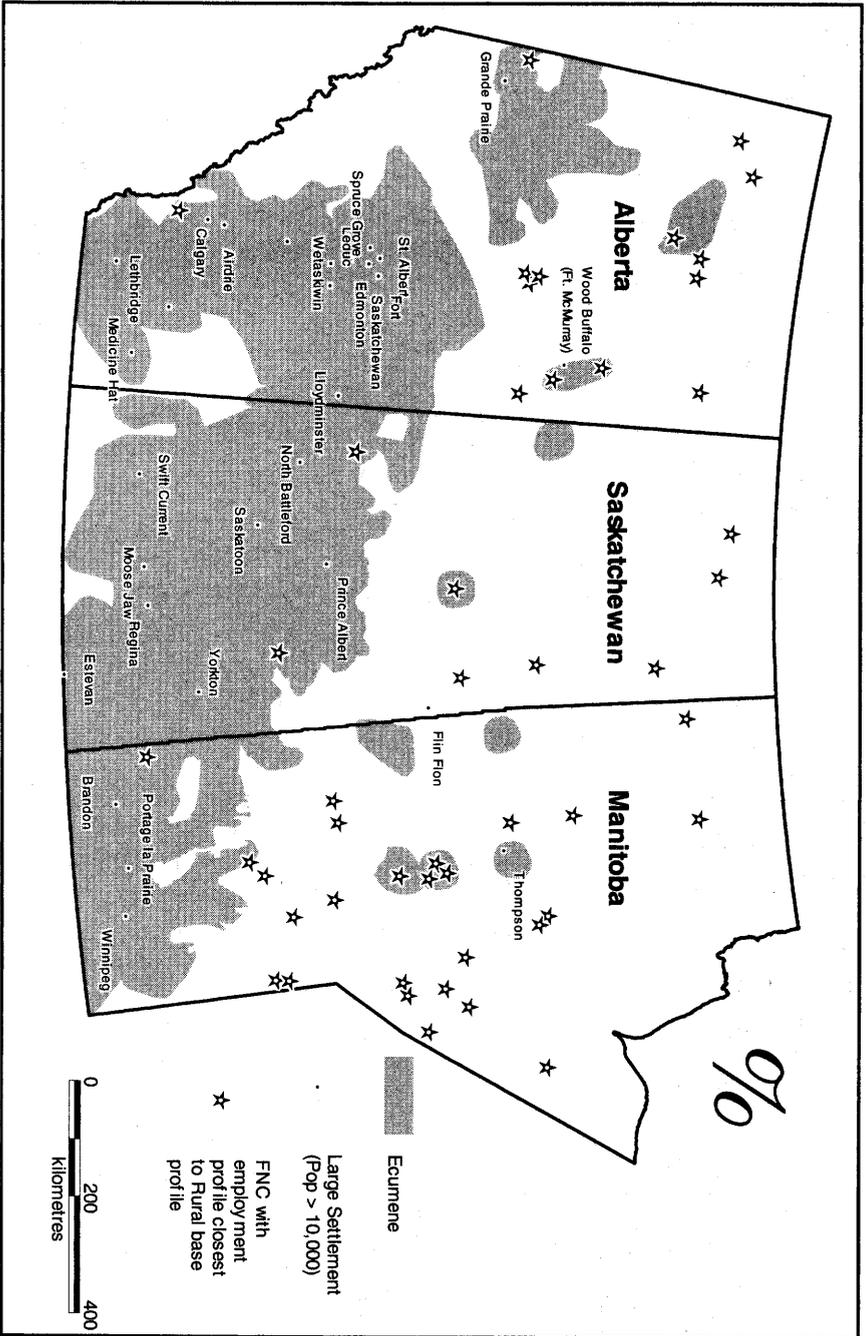
**Quaternary Sector Industries**

- K: Finance and insurance industries
- L: Real estate operator and insurance agent industries
- M: Business service industries

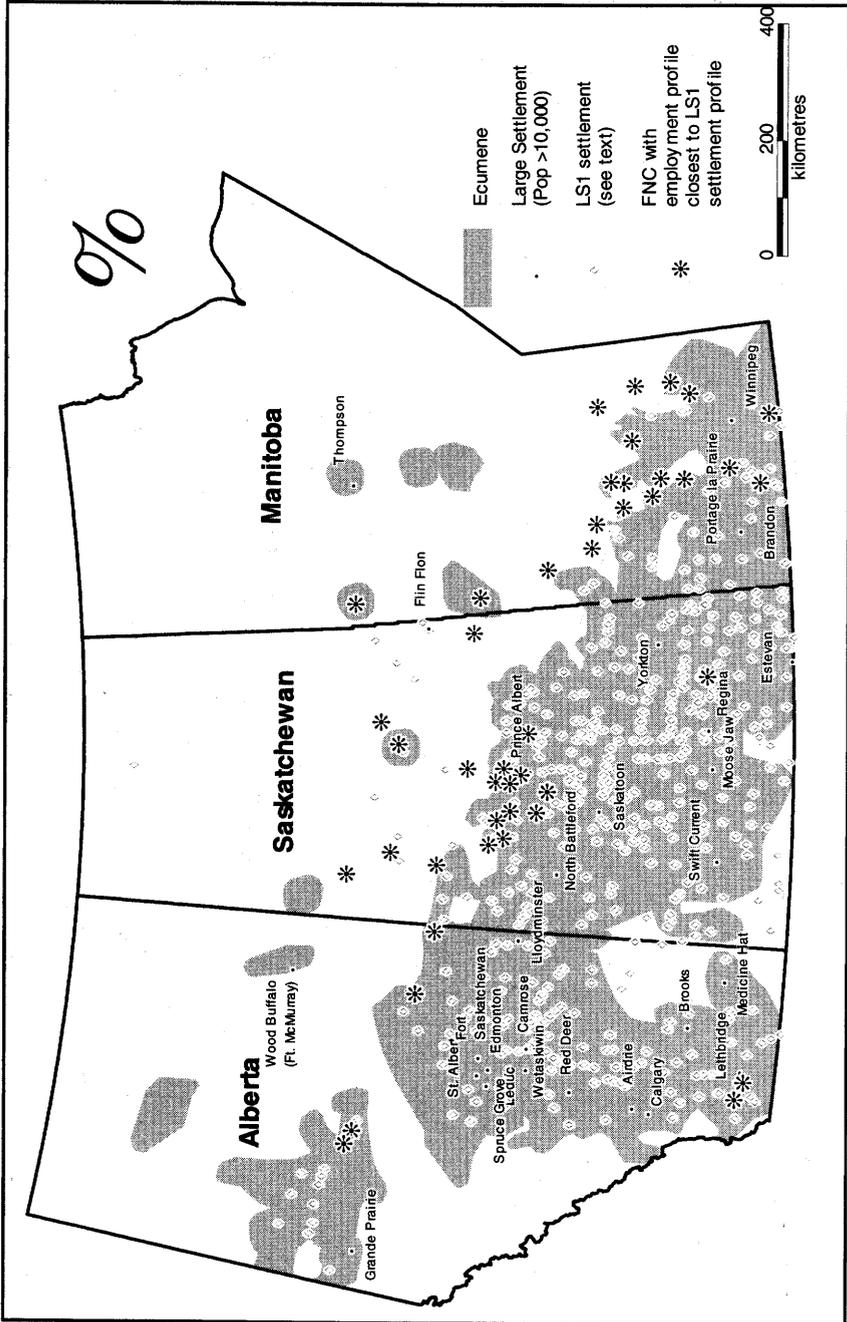
**Quinary Sector Industries**

- N: Government service industries
- O: Educational service industries
- P: Health and social service industries

**Figure 3**  
**FNCs with Employment Structure Most Similar to LR Base Profile**



**Figure 4**  
**FNCs with Employment Structure Most Similar to LS1 Base Profile**



**Figure 5**  
**FNCs with Employment Structure Most Similar to LS2 Base Profile**

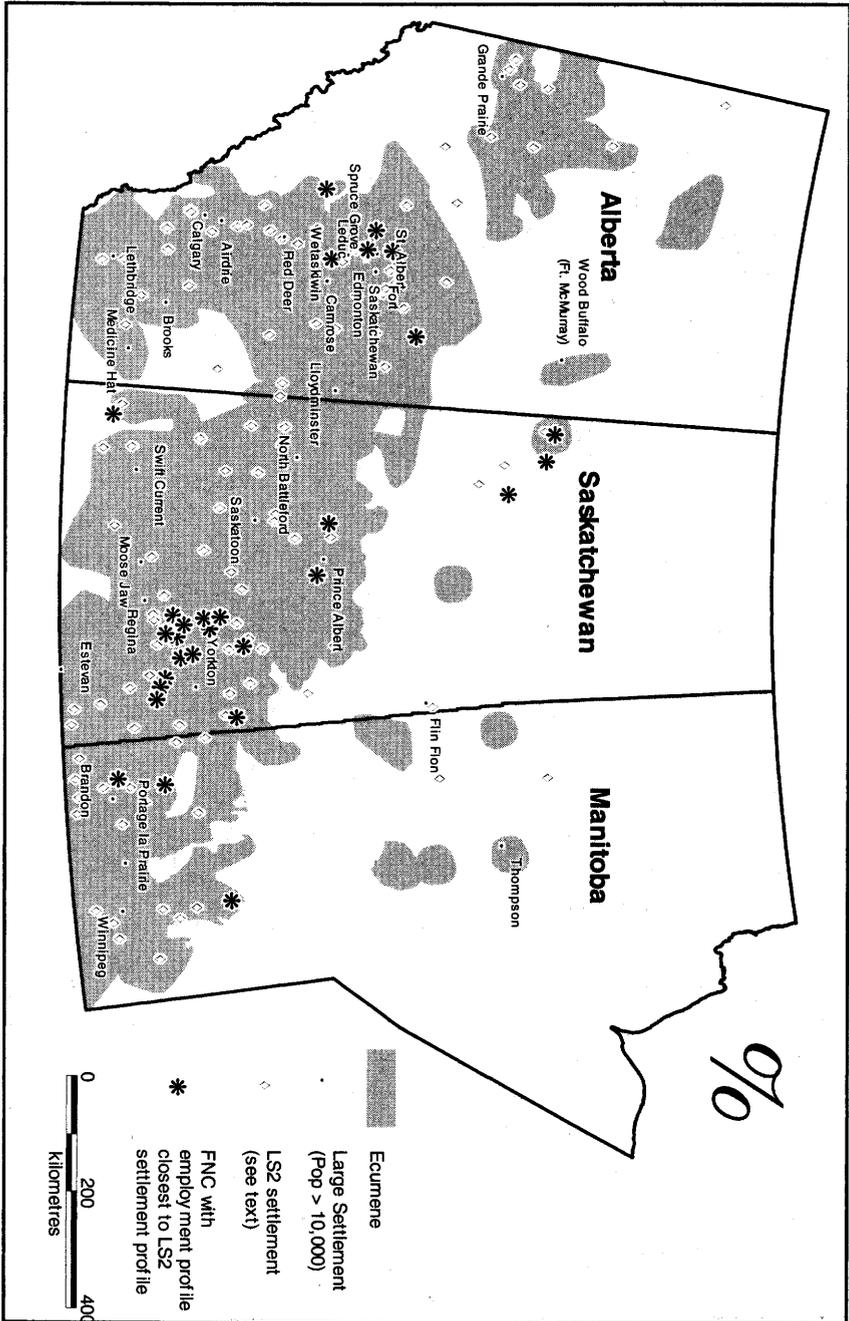


Figure 6  
FNCs with Employment Structure Most Similar to LS3 Base Profile

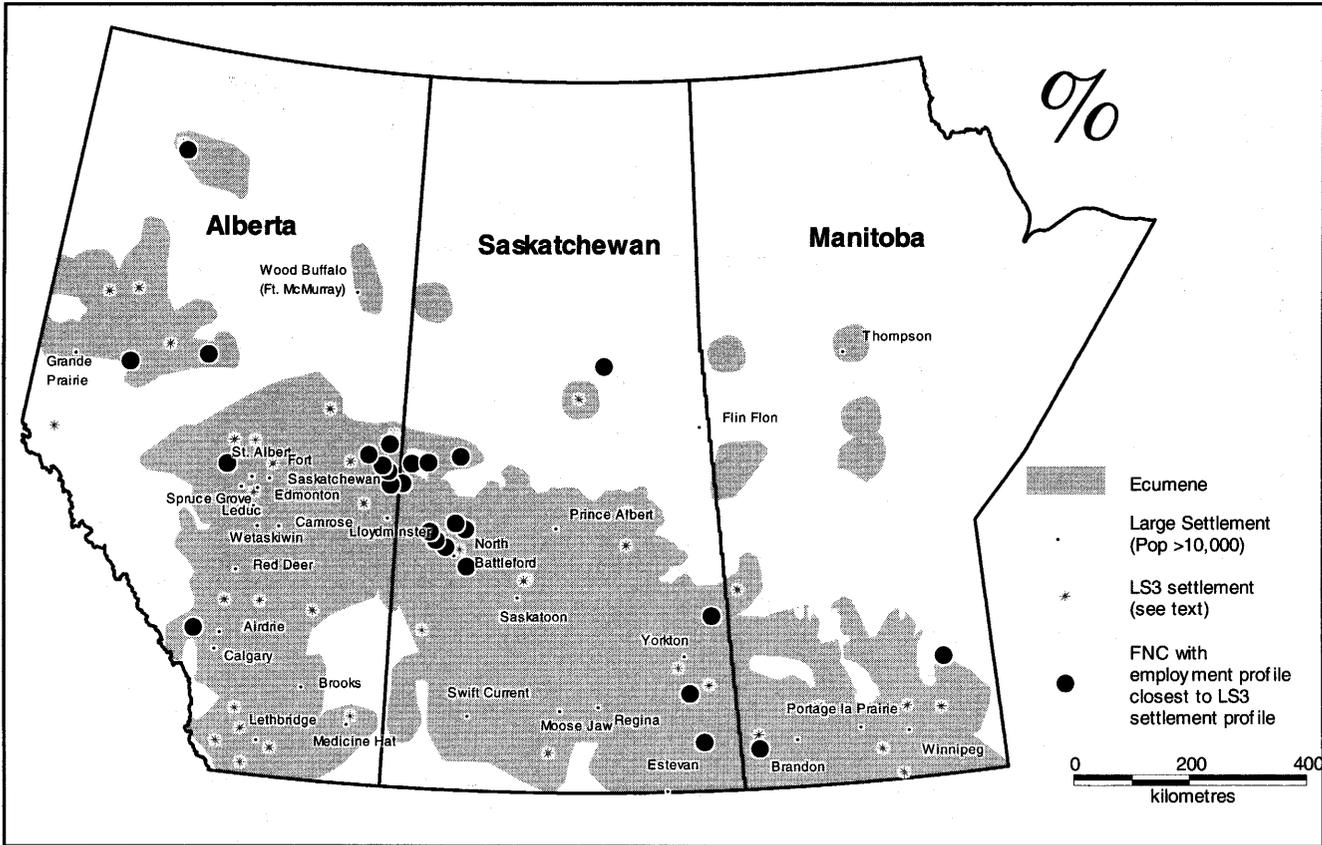
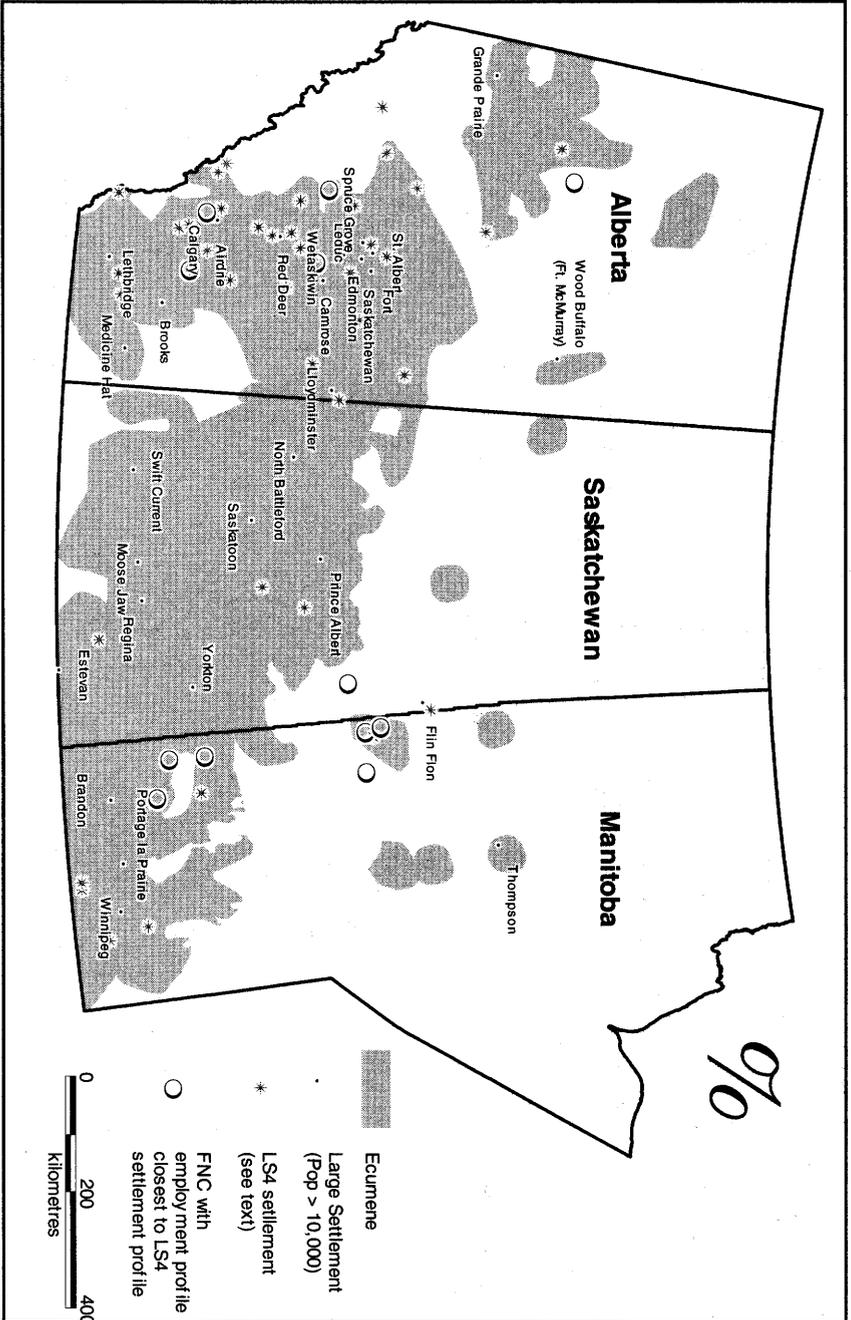


Figure 7

FNCs with Employment Structure Most Similar to LS4 Base Profile



parison of the different groups. The discussion below first describes the employment sectors that are associated with the integration or similarity of the various sets of FNCs relative to their most similar base profile—those sectors that fall into category (iii) above. For each of the separate groups we then focus on the employment characteristics that represent important deviations from the base profile—sectors that are absent or underrepresented (categories (i) and (ii) above), as well as sectors that are overrepresented in the FNC labour force (category (iv) above). Thus categories (i), (ii), and (iv) are the main features that account for the employment specialization or dis-integration of the FNC labour force from their most similar employment structure. The spatial characteristics of the separate groups are shown in Figures 3 through 7.

### A) General Characteristics of the Groups

The 159 FNCs included in this study were grouped according to which of the five comparative employment profiles within their immediate hinterland their own employment structure was most similar, and hence most integrated (see Figure 1 for example). A summary of the population sizes, labour force sizes, unemployment rates, incidence of employment on-reserve, and levels of employment specialization relative to their most similar profile, is summarized for each of these groups in Table 2. A review of the summary information in Table 2 shows that all of the various groups of FNCs do not represent homogeneous sub-groups of communities, but sets of communities that are rather heterogeneous. All of the groups are highly variable in terms of their population size, size of the employed labour force, unemployment rates, incidence of on-reserve employment, as well as the degree to which they match their most similar employment base profile. None of these indicators vary in significant ways between the different sets of communities (note 2), and so are not key sources of difference or predictors of which base profile a given FNC will be best integrated with. The more important variable in terms of this discussion is the Gini Index of specialization. The range in values found within each group illustrates that some FNCs are considerably more alike their base profile than are others. Moreover, the mean values for each group suggest that the typical FNC within each group deviates considerably from the very profile to which it must be considered most similar. In other words, these values suggest that a relatively high level of *dis-integration* in employment structure is the norm, regardless of which profile is defined as most similar to the individual FNC profile.

Although the groups all vary considerably, some rather distinctive spatial patterns or geographies of integration are evident for some

**Table 2**  
**Summary Characteristics of the FNC Groups**

<b>FNC Groups</b>	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>Std. Dev.</b>
<b>FNCs Most Similar to LR Base Profile (n=48)</b>				
Population (1996)	89	3402	801	671
Total Employed Labour Force	50	895	185	157
Unemployment Rate	0.0	50.0	27.4	10.6
% Employed On-Reserve of Residence	0.0	100.0	65.7	27.3
Gini Index of Specialization	0.38	0.86	0.61	0.13
<b>FNCs Most Similar to LS1 Base Profile (n=44)</b>				
Population (1996)	50	4326	770	730
Total Employed Labour Force	50	1180	195	201
Unemployment Rate	0.0	46.2	27.6	9.6
% Employed On-Reserve of Residence	0.0	92.9	58.0	20.7
Gini Index of Specialization	0.32	0.89	0.58	0.12
<b>FNCs Most Similar to LR2 Base Profile (n=29)</b>				
Population (1996)	175	1049	529	262
Total Employed Labour Force	50	340	146	80
Unemployment Rate	14.3	45.7	25.2	6.5
% Employed On-Reserve of Residence	0.0	77.6	56.0	18.4
Gini Index of Specialization	0.41	0.82	0.62	0.11
<b>FNCs Most Similar to LS3 Base Profile (n=26)</b>				
Population (1996)	166	2157	590	426
Total Employed Labour Force	50	500	132	96
Unemployment Rate	12.5	46.6	26.3	8.6
% Employed On-Reserve of Residence	33.3	85.2	58.6	14.6
Gini Index of Specialization	0.34	0.87	0.63	0.13
<b>FNCs Most Similar to LS4 Base Profile (n=12)</b>				
Population (1996)	219	2678	814	779
Total Employed Labour Force	55	840	253	265
Unemployment Rate	4.0	39.1	22.6	9.6
% Employed On-Reserve of Residence	6.6	71.6	51.4	21.8
Gini Index of Specialization	0.36	0.74	0.60	0.14

Note: Statistics given for the Gini Index of Specialization are specific only to the base profile by which the FNCs are grouped.

groups. Those communities that are most similar to the non-Aboriginal rural labour force profile (LR) exhibit a rather distinctive spatial pattern (Figure 3). The vast majority are situated outside of the ecumene in the remote northern parts of the prairies. Few have any major settlements within their local region—61% of this group have no communities with at least the population and labour force size of LS1 settlements. Thus, northern rural isolation is a typical feature of these communities, although Figure 3 shows that this is not a universal characteristic, since a few of the communities are situated within the southern prairie ecumene. The

FNCs that are similar in employment profile to the LS1 communities within their region are generally found in the mid-prairies, forming a rather distinctive belt on the northern fringes of the ecumene, running from north-western Alberta in the Grande Prairie region to south-eastern Manitoba. Yet an important concentration of these communities is found in the area west of Prince Albert, Saskatchewan (Figure 4). So by comparison with the former group, these FNCs are considerably less isolated and all have at least small non-Aboriginal settlements within their immediate region. Communities that were grouped as being most integrated with the LS2 settlements within their region are found in all of the prairie provinces, and, not surprisingly, most are well situated within the ecumene where the density of LS2 settlements is high (Figure 5). They are not, however, uniformly dispersed, but a number of concentrations are evident, often in close proximity to the larger cities. For instance, clusters of these communities are found in the Edmonton region, the Regina and Yorkton area, the Prince Albert region, and in the Brandon area. Those FNCs that exhibit the greatest similarity to the LS3 settlements within their immediate hinterland are also distributed throughout all of the prairie provinces, although geographically these are found in diverse areas (Figure 6). Some are situated in remote northern areas, while others may be found in relatively close proximity to metropolitan centres, even though the dominant concentration is around the Lloydminster and North Battleford area. Finally, Figure 7 shows those communities that have been grouped as being most similar to the LS4 profile of their local regions. While they can be identified in all of the prairie provinces, they too are found in diverse locales—some are relatively remote northern communities on the fringes of the ecumene, others are found in southern regions, particularly in southern Alberta in the Calgary region, and southern Manitoba near Dauphin and Riding Mountain National Park. A further concentration is evident in the region of The Pas Manitoba.

### **B) Sources of Employment Integration with the Most Similar Profile**

Figure 2 identifies the employment sectors in the FNC labour force that have relatively similar concentrations ( $0.5 < LQ < 1.5$ ) to what is found in the base profile that most closely matches the FNC structure (see row (iii) in Figure 2). In technical terms, these sectors have very little impact on the magnitude of the Gini Index. In other words, this row identifies the sectors that do not account for major deviations in the profiles, and hence can be considered the economic activities that are sources of integration rather than dis-integration. A number of general trends can be summarized.

In terms of primary sector activities, it can be seen that employment in fishing and trapping, as well as logging and forestry industries, are generally found in similar concentrations in those FNCs that are most like their rural hinterland as well as those that are most similar to the LS1 communities within their local area. Yet this is not true of the FNCs that are similar to larger settlements. In the case of FNCs that are most similar to LS2 and LS3 base profiles, agricultural employment, and mining-related employment in the latter, are the sectors that have similar concentrations. No primary sector activities can be linked to the employment integration of the communities considered most similar to LS4 settlements.

Some secondary sector activities can be linked to employment integration, but Figure 2 shows that this is relatively rare, and generally occurs only in those FNCs that are similar to LS1 and LS2 settlements. For both of these sets of communities, similar levels of employment in the construction sector is the norm, but manufacturing activity is only a source of integration for the FNCs that are most similar to their local LS2 profile. Overall, secondary sector activities are not a key source of employment integration for the majority of FNCs.

A limited number of tertiary sector employment categories (four of six) can be identified as sources of employment integration, but Figure 2 shows that these are generally more prevalent for the FNCs that are integrated with the lowest orders of the settlement hierarchy. For instance, three tertiary sectors are generally sources of integration for the FNCs that are similar to their rural profiles as well as those that are similar to their LS1 and LS2 profiles—although there are subtle differences and the retail sector is only important for rural integration. In contrast, only one of these categories—communications and utilities, is linked to relative integration of the FNCs that are most similar to their LS4 profile.

Only one of the three quaternary activities—the business services sector, is a source of relative employment equality for the FNCs. Nevertheless, Figure 2 shows that its impact as an integrating employment category is not universal but seems to operate at the lower and highest levels of the settlement hierarchy used here. It is not a source of employment integration for the FNCs most similar to their LS2 and LS3 profiles.

The health and social services sector is the only one of the three quinary sectors that can be linked to relative employment integration, and Figure 2 shows that this occurs for all of the sets of FNCs with the exception of those that are most similar to their LR profile. Thus health and social services functions, generally found only in settlements, do not typically contribute to FNC employment inequalities, regardless of

which scale of the settlement hierarchy the FNCs is best linked to.

In summary, it should be noted that many different types of employment are identified in row (iii) of Figure 2—eleven of the eighteen sectors. As such, many types of economic activity can in some way be linked to the integration of FNC employment structures with the non-Aboriginal labour force within their local regions. Yet what is important here is that the different sectors have a differential impact—different types of employment, and different combinations of sectors, provide varying kinds of integration, depending upon which part of the settlement hierarchy the FNC is most integrated. This, however, is only one side of the information summarized in Figure 2. It also summarizes the general trends that account for dissimilarity between the FNCs and the base profiles to which they are considered most similar.

### **C) Sources of Employment Dis-Integration from the Most Similar Profile**

The dis-integration of a FNC from its closest profile can occur because of either under-representation or over-representation in the different employment categories. Rows (i) and (ii) in Figure 2 summarize the principal ways in which sectoral under-representation is evident for the different groups of FNCs, whereas row (iv) summarizes the sectors that are generally linked to sectoral over-representation in the various FNC employment profiles. In technical terms, major sectoral under-representation and over-representation has a large impact on the magnitude of the Gini Index, since these represent forces of specialization or deviation from the systemic base profile. In other words, rows (i), (ii), and (iv) in Figure 2 identify the employment sectors that do account for major deviations in the profiles, and hence can be considered the economic activities that are sources of dis-integration rather than integration. A number of general trends can be summarized.

#### **C1) Under-Representation**

Figure 2 shows that significant under-representation or a deficit of workers in the average profiles of FNC employment can be linked to a variety of primary, secondary, tertiary, and quaternary sectors, but not to the quinary sectors.

Primary sector deficits are found in all of the different FNC types, although the specific types of under-representation varies depending upon the level of the settlement system that the communities are most integrated. For example, a deficit of workers in agriculture as well as mining-related activities is common to those FNCs that are similar to their LR profile and those similar to their LS1 profile. In other words, this combination of under-representation is most pronounced at the lowest

levels of settlement system integration. In contrast, for those communities most integrated with the LS3 settlements, under-representation is linked only to a deficit of workers in the fishing and trapping sector. For those FNCs integrated with the LS4 profile, mining-related work is poorly represented in the overall employment profile, while residents of these places are typically non-participants in the fishing and trapping sector.

In terms of secondary sector activities, a deficit of workers in the manufacturing sector is a near-universal characteristic of FNC employment profiles, regardless of which level of the settlement system they are most integrated. The only exception is amongst those FNCs that have employment profiles similar to the labour force of LS2 settlements, where manufacturing is fairly well represented. Figure 2 also illustrates that in none of the groups of FNCs is the labour force generally excluded from either manufacturing or construction, even though these sectors may not be represented on every reserve.

Tertiary sector deficits are associated with major differences in the labour force structures of all of the groups of FNCs, although Figure 2 shows that various sectors have different impacts depending upon the level of settlement integration. For instance, the typical LR-similar FNC has a labour force that is completely excluded from the wholesale trade sector, and has a major deficit of workers in the accommodation, food, and beverage sector. Those communities most like their LS1 and LS2 profiles have similar kinds of deficits of tertiary jobs—typically both are under-represented, but generally not excluded from, the wholesale, retail, and accommodation, food and beverage sectors—an important form of inequality because these are the types of functions that are crucial to the economic base of small service centres or central places on the prairies (Stabler and Olfert 1992; 2002).

Quaternary employment is the hallmark of advanced economies, and higher order urban places and metropolitan areas in particular. Hence, it is not surprising that these sectors account for a minor part of all employment in the rural areas and small settlements surrounding FNCs. Nevertheless, by comparison with the various comparative base profiles, the FNCs are generally characterized by significant deficits of workers in most forms of quaternary activity. Figure 2 shows that in a number of the groups of FNCs, some quaternary sectors are characterized by non-participation by the FNC labour force. For instance, in every one of the FNCs identified as LR-similar, no workers held jobs in the finance and insurance sector. Similarly, for every community identified as LS3-similar, no workers held jobs in the real estate operator and insurance agent sector. Yet in addition to these kinds of sectoral exclusion, the FNCs are characterized by employment deficits in many other quater-

nary activities, although the combinations of these deficits vary depending upon the level of settlement system integration. Amongst LS2-similar FNCs, for example, it is common to see under-representation in the finance and insurance sector, the real estate and insurance agent sector, as well as the business services sector. By contrast, in LS1-similar FNCs, the under-representation is typically associated with worker deficits in the finance and insurance sector and the real estate and insurance agent sector, but not with deficits in the business services sector.

To summarize, many forms of employment deficit, in all of the major sectors except quinary activities, contribute to the more specialized employment structures of the FNCs. Figure 2 illustrates that we must be cautious in assuming that all FNCs are alike or that different employment sectors have a similar or universal impact. It emphasizes that very different combinations of sectoral under-representation or deficits of workers can be linked to FNC specialization or dis-integration from their most similar micro-regional profiles, and that these combinations of worker deficits vary considerably depending on which part of the settlement hierarchy the FNCs are best matched.

## **C2) Over-Representation**

Like under-representation, the over-representation of employment in specific sectors (i.e. a relative surplus of workers in a sector) contributes toward the specialized character of FNC employment profiles—that is, to the dis-integration of the FNC profile from its most closely matched profile. Very marginal kinds of over-representation are evident in terms of primary, secondary and tertiary activities, whereas the definitive character of almost all FNCs is the dis-integration that results from extreme over-representation in terms of quinary activities, and the government services sector in particular.

Figure 2 shows that a surplus of workers in primary sector activities is generally only linked to those FNCs that are most integrated with LS3 and LS4 profiles, and that only two of the primary sectors—agriculture, and logging and forestry—are associated with worker surpluses. Yet the pattern is different for the two sets of FNCs. In the case of LS3-similar communities, only logging and forestry is over-represented, whereas the typical LS4-similar FNC has a surplus of workers in both agriculture and logging and forestry.

In terms of secondary sectors, only the construction sector is associated with excess workers in the FNC labour force profile. Yet Figure 2 shows that the impact of this sector in creating a more specialized FNC profile varies, depending upon the level of settlement integration of the FNC. For instance, this sector is a major source of dis-integration for the

LR-, LS3-, and LS4-similar FNCs, but it is not for the LS1- and LS2-similar FNCs.

In general, very few FNCs are well represented in terms of tertiary sector jobs—an important inequality and form of marginalization from the contemporary service-oriented Canadian economy. Tertiary activities are also crucial sectors that in many ways define the economic character of small settlements and trade centres on the prairies—places that function as important shopping centres and central places. Yet Figure 2 shows that for the vast majority of FNCs, over-representation in these sectors is non-existent or else is limited to a few sectors. Only the FNCs that are LR-similar have an excess of workers in the communications and utilities sector, whereas only the LS3-similar FNCs have an excess of workers in the transportation and storage sector.

One of the most important and problematic features of Aboriginal employment that is summarized in Figure 2 is the near-universal over-representation of employment in quinary sector activities—a fact that reflects a legacy of exclusion from other sectors, a continued reliance on government transfers, and a major problem for Aboriginal self-direction, economic development, and local autonomy. In almost every FNC, it is the dominance of these sectors, and the government services sector in particular, that accounts for the highly specialized employment profiles. Amongst the communities studied here, jobs in the quinary sectors range from 10.5 to 100% of local FNC employment, and average 57% of all local FNC employment. Yet amongst these activities, dependence on government sector, which includes band council employment, is the most extreme. Although it can range from 0.0% in some communities to 62.5% in others, this sector averages 28.8% of local employment, and is the most dominant of all of the eighteen employment categories included in this study. By contrast, the education sector averages 15.3% of local employment whereas the health and social services sector averages 13.2% of local employment.

Figure 2 reveals that over-representation in government services and education is high regardless of which level of the settlement hierarchy best matches the FNC employment structure. Consider the levels of over-representation in government services, for instance. The LQs that were measured for each of the separate groups indicated that over-concentration by a factor of about 4 is very common. LR-similar FNCs average 4.0 times the share of workers in this sector as the non-Aboriginal rural labour force within their local region. Similarly, average LQs of 4.0, 4.9, 4.3, and 3.8 were measured for the LS1-, LS2-, LS3-, and LS4-similar FNCs respectively. Therefore, regardless of which employment structure most closely resembles that of the FNC profile, the Aboriginal labour

force has significant surpluses of workers in this sector relative to their most similar base profile. This is the most important form of inequality in the FNC employment structures, and the principal sector that accounts for the high levels of specialization measured by the Gini index. It is therefore always the dominant feature associated with the dis-integration of the FNC labour force from its most similar, or most integrated, employment profile. Figure 2 also shows that for every group of FNCs there is simultaneously a significant over-representation or surplus of employment in the education sector. Although this is not as extreme as the government services sector, with average LQs in the order of about 1.6 to 1.7 for all of the groups, it is nevertheless an important contributor to the observed deviation or specialization of the FNC employment profiles.

To summarize, with the exception of quinary sectors, relatively few other sectors have a substantial impact in defining the deviation of FNC employment profiles from their best-matched profile. Figure 2 captures one of the most significant problems as far as Aboriginal employment structures and economic development is concerned—namely the significant and almost universal over-representation of employment in quinary activities. The extreme excesses of Aboriginal workers in the government services sector, for example, is manifest for all groups of FNCs, regardless of where within the settlement hierarchy the FNCs appear to be most integrated. This kind of over-representation is therefore the dominant reason why FNCs have highly specialized employment profiles as measured by the typically high values of the Gini index. It is also, therefore the key source of inequality or dis-integration of the FNC labour force from the employment structure of their local regions.

## **6. Conclusion**

FNCs are often viewed as a set of communities defined in large part by a commonality of rural isolation and extreme social and economic marginalization. From a macro perspective, Aboriginal communities have been likened to the Third World within Canadian borders, in which underdevelopment and exclusion from Canadian society and economy has meant that these communities are plagued by problems of unemployment, high levels of dependence, and highly specialized and limited employment profiles. Much of the contemporary literature on Aboriginal economic development has drawn attention to the need for FNCs to become more economically diversified, and to engage in new forms and strategies of local development that strengthen Native cultural values and social cohesion, but at the same time allow FNCs to become more *economically integrated* into the non-Aboriginal economy and settle-

ment system.

Although some have called for more systematic studies into reserve economies and FNC employment structures, the literature on the structure and diversity of employment of on-reserve residents is scant. The question of the extent to which FNCs are integrated with the employment structure of their local regions has not adequately been addressed to date. This paper has attempted to address this knowledge gap through an exploratory study of the employment structure and diversity of FNCs on the prairies, and an attempt to understand how these communities are integrated with, or vary from, the employment structures of rural areas and a variety of lower order settlements within their immediate local regions. By comparing every FNC with five distinctive base reference employment profiles, each representing a different level of the surrounding settlement system, the FNCs were classified according to which profile was mostly closely matched to their own, and hence, to which part of the rural or settlement hierarchy they could be considered most economically diversified or most economically *integrated*.

The study has shown that the prairie FNCs are not a homogeneous group of communities that are completely distinctive, separate, or marginalized from the economies of their local regions. Rather, this analysis has shown that a variety of forms (levels) of economic integration can be identified, and these forms of integration can have relatively different geographies. Some communities, primarily remote northern communities, were shown to be most structurally similar, and hence most integrated with, the labour force characteristics of their surrounding rural region, rather than with the four levels of settlements within their region. Others, however, with varying geographies, were shown to be most integrated with one of the four settlement profiles. So the results have shown that economic *integration* with the settlement system does occur at a number of different levels in the hierarchy. To *some extent*, then, the so-called divide between FNCs and the Canadian settlement system has already been partially bridged at many different levels.

However, our findings of employment *integration* must be interpreted with caution, because a key finding of the study is that for every level of settlement system integration that was identified, high levels of employment *specialization* in the FNC profiles is the norm. Specialization, in this sense, is simply another term for *deviation* from a given employment profile, and so specialization is really a measure of differences or inequalities in the representation of various employment sectors. Thus specialization, in essence, measures *dis-integration*. This, then, is the paradox of integrated dis-integration. The FNCs may be integrated—i.e. *most integrated*—with the employment characteristics of a particular

part of the settlement system within their immediate local area, such as towns of 5,000 to 9,999 people. Yet at the same time, the typical or average FNC within this group has an employment profile that deviates considerably from the very profile it most alike. Thus the typical FNCs cannot yet be considered a fully integrated part of the settlement hierarchy that it is most—the FNCs are *similar but different*.

We have attempted to isolate and summarize the general features that lie behind these similarities and differences for each group of FNCs, as well as those that seem to be universal. Through an analysis of the sectoral concentrations of employment on the reserves, we have identified how unique sets of sectors may be associated with the similarities as well as differences. Many types of economic activity were found to be linked to the integration or similarity of the FNCs to their best matched profile, although it was shown that these sectors have a differential impact—different types of employment, and different combinations of sectors, provide varying kinds of integration, depending upon which part of the settlement hierarchy the FNC is most integrated. A similar kind of complexity was shown to lie behind the specialization or dis-integration of the FNCs from their best matched profile, which is really a function of deficits or surpluses of workers in particular sectors. FNCs exhibit many forms of employment deficits, representing all of the major sectors with the exception of quinary activities, but the findings here suggest that unique combinations of worker deficits are linked to specialization amongst the different groups of FNCs. Very few sectors were shown to be linked to a surplus of workers in the FNC profiles, regardless of which type of settlement profile best matched the employment character of the FNC. But there is one crucial exception—a universal characteristic that underlies the specialization or dis-integration of the FNC labour force is the extreme over-representation of local employment in quinary sector activities, and in the government services sector in particular. This is a reflection of the legacy of dependence, continued reliance on social transfers, and the dominant role of band council employment.

Because of the system-wide approach adopted here, we have not attempted, nor have we been able, to explain the unique situation of every FNC in terms of employment diversity, nor the intricacies of local area economic integration. Nevertheless, this exploratory research does provide some useful insights in terms of any attempts to develop the economies of FNCs. The methodology, and particularly the rubric used in Figure 1, could be adapted for an individual FNC. Suppose, for instance, that a particular FNC aimed to develop a local economic development plan that would move it from being a highly specialized and perhaps marginalized rural-similar community to one that had a local

employment structure that was *just as diverse* as the small cities within its local region—i.e. perfectly integrated with this scale of the settlement system. Of course, such a plan would need to be context-dependent, but such a community would need to know which sectors required new job creation because of worker deficits, and which sectors required a reduction of workers because of large worker surpluses. Bearing in mind the local context, resource base, and human capital potential of its community, it would, ideally, target its development plan to address these issues and to restructure the sectoral employment profile of its residents to match that of the comparative base profile. Only in this way will full integration be achieved. Such an approach, of course, may be more hypothetical than real. Nevertheless, without attention to these kinds of local area and settlement system integration issues, it is doubtful that the divide between FNCs and non-Aboriginal communities will ever be fully bridged.

Integrated dis-integration is now a reality amongst prairie FNCs. It is our hope that in the very near future replicate studies of this kind will identify a pattern of integrated integration.

### Notes

#### Index of Local Specialization or Location Quotient

$$LQ_{i,j,base} = \frac{e_{i,j}/e_{t,j}}{E_{i,base}/E_{t,base}}$$

Where:

$e_{i,j}$  = Number employed in industry  $i$  in FNC  $j$ .

$e_{t,j}$  = Total employed in all industries ( $\sum e_i$ ) in FNC  $j$ .

$E_{i,base}$  = Number employed in industry  $i$  in Base employment profile (e.g. Rural Areas, LS1 settlements, LS1 settlements, etc.)

$E_{t,base}$  = Total employed in all industries ( $\sum E_i$ ) in Base employment profile (e.g. Rural Areas, LS1 settlements, LS2 settlements, etc.)

$LQ_{i,j,base}$  = Location Quotient for Industry (employment category)  $i$  in FNC  $j$  relative to Base employment profile (e.g. Rural Areas, LS1 settlements, LS2 settlements, etc.). A value of 1.0 indicates the FNC has the same proportion of employment in the specific category  $i$  as the Base proportion in category  $i$ .

## Calculation of the Gini Coefficient

$$G_j = \frac{\sum_{i=1}^{n-1} |C_i D_{i+1} - D_i C_{i+1}|}{10000}$$

Where:

$C_i$  = the cumulative percentage of the labour force in industry  $i$  for the specific FNC  $j$  being studied;

$D_i$  = the cumulative percentage of the labour force in industry  $i$  for the base scale economy (e.g. Rural Areas, LS1 settlement, LS2 settlements, etc.);

$n$  = the number of industries or employment categories used in the analysis, ranked in order of their specialization as measured by their Location Quotients LQ;

$G_j$  = the Gini Index for FNC  $j$ . A value of 0.0 indicates complete "diversification" (identical profile to "base profile" rather than an equal shares [uniform] profile) and a value of 1.0 indicates complete "specialization" (all employment in only one category).

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