

A Look beyond Metropolis: Exploring Creative Class in the Canadian Periphery*

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Introduction

In the last few years, Richard Florida's creative class thesis (Florida 2002b), inspired the interest and criticism of scholars all across economic geography and regional science. Following Florida's works, a number of studies developed his approach and placed his inquiry in a wider geographical context. It became almost conventional to cite the creative class among major drivers of regional development and to consider it as the key element of regional competitiveness. The ability of regions to attract the creative class through openness and diversity is widely perceived as a condition, underpinning innovative development and knowledge-based economic growth (Florida 2002a, 2002b; Florida and Gates 2001). Florida's thesis found some support in empirical studies, which measured creativity and analyzed its effects on regional economic competitiveness (see Florida 2002a, 2002b; Gertler et al 2002). Although causal links of such effects largely remain unclear (Markusen 2006; Scott 2006), the notion of creativity has firmly become a part of the knowledge economy metatheory (Tremblay 2005).

Substantial undertakings to analyze the creative class in Canada were accomplished for the largest Canadian and Ontario cities, partially with Florida's own participation (FCM 2002; Gertler et al 2002). This research generally supported the applicability of Florida's approach to studying creative capital in different geographical settings.

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However, the early creative class research has not avoided an apparent geographical bias, focusing exclusively on core metropolitan areas. Although preoccupation with large urban regions reflects the concentration of the creative class in metropolitan areas (Florida 2002b; Gertler et al 2002; Polèse and Tremblay 2005), this tradition unjustly marginalizes peripheries as study sites. Meanwhile, as argued below, the importance of the creative class for economic development is not an exclusive prerogative of large conurbations, but is the property of all regions in the contemporary innovation-based economic era. Moreover, there is some evidence that creativity can be even more critical for reviving economies in middle-sized and small towns (and, perhaps, rural areas) than it is in the metropolis.

This, however, does not mean that Florida's thesis, and especially his policy recommendations, are directly applicable in non-metropolitan settings. This paper rather aims to suggest that the idea of the creative class as an economic factor in the periphery should not be dismissed, but ought to be carefully studied. The uniqueness of peripheral areas also implies that traditional arguments, raised in favor of Florida's thesis (Florida 2002b, 2005; Gertler et al 2002) or against it (Glaeser 2004; Peck 2005; Markusen 2006; Shearmur 2007), may have to be revised and reconsidered.

What follows has three major objectives. The first is to discuss the applicability and implications of the creative class approach to economic development in peripheral areas struggling for their economic survival. The second is to conduct an exploratory analysis of the creative class geography *beyond metropolis*, i.e. to measure the creative class in peripheral regions (using two scales of study: 288 Canadian Census divisions and 34 communities in the Canadian North). This task requires elaborating the creative class measures, both to account for a more complex definition of the creative class (advanced below) and to adopt indicators tailored to the Canadian context. This is the third objective. Overall, this paper presents some initial, but encouraging results in applying the creative class framework to the Canadian periphery.

Creative Class Beyond Metropolis: Why and How Does It Matter?

Peripheral and frontier regions are struggling to meet the challenge of new economic realities of the post-industrial era and to break with their resource-based development path (Bourne 2000; Leimgruber 2004). An increasing integration of peripheral economies into the global market and advancements in information transfer has not narrowed the gap between centre and periphery. Marginal regions have largely failed to take advantage of new opportunities of knowledge-driven development. It has been argued that 'learning' in the peripheral regions is extremely difficult, if not impossible, because they severely lack physical, financial, institutional and human capital to support the 'learning' process (Hanson 2000). Peripheral regions tend to develop a 'branch-plant' culture, dependent on entrepreneurship and innovativeness 'imported' from the metropolitan headquarters. Most importantly, peripheries lack creative human capital necessary to complete the

regional breakthrough and break with path-dependency (Bassanini and Dosi 2001; Schienstock 2005).¹ Caught in the staples trap, economies and innovation systems in the resource periphery receive very narrow flows of knowledge through a few major institutional agents, such as the state and large corporations. At the same time, as Florida argues, “places with dense ties” and strong social bonding, as many peripheral communities are, provide poor ground for novel combinations of knowledge and resources, instead, promoting lock-in (Florida 2002b). In these conditions, ‘learning’ is rarely more than just a reproduction of existing knowledge developed elsewhere, whereas the bottom-up innovation potential is largely ignored. In sum, most peripheries are short of ingredients required to accomplish economic transformation.

Lock-in eventually triggers economic crisis. There are two development trajectories for the region at this point: regional reinvention (a new path creation) or winding down (Bathelt and Boggs 2005; Schienstock 2005). The concept of path creation postulates that regional self-reinvention requires scientific, institutional, economic and social shifts that allow for inventing or adopting new knowledge (Bassanini and Dosi 2001). However, the most important component is the agents of transformation. These agents can have various forms and be political institutions, firms or NGOs. However, in the end, the agents of change are always people, the individuals and their groups who ‘write’ the innovation history of the region (Bassanini and Dosi 2001). As it has been pointed out by Schienstock (2005: 5):

“[t]o explain the development of a new national techno-organizational trajectory <...> [t]he path creation perspective ... sees [economic actors] as knowledgeable agents with a capacity to reflect and act in ways other than those prescribed by the existing social rules and taken-for-granted technological artefacts. Path creation is seen as a process of mindful deviation by people who have an understanding of the characteristics the new paradigm offers. Therefore the transformation process to a great extent depends on the engagement of certain people being particularly good in imaginative exploration and creation. Among them, social pioneers scientists, politicians and entrepreneurs prepared to initiate and conduct anticipatory institutional change have a crucial role to play”.

The emphasis on the ‘imaginative exploration’ and ‘creation’ as the vehicles of path-creation is especially crucial. With necessary settings in place, the creative capacity of the human capital, perhaps, is *the* power that can deliver economic revitalization to the region. More properly, the regional innovation system is more likely to move on from path-dependency, if it possesses the necessary creative

1. Path-dependency is the persistence of historically and socially embedded organizational trajectories (Lundvall 1992; Bathelt and Gluckler 2003). The absence of change eventually results in the ‘lock-in’ (Grabher 1993), when a region loses competitiveness. To ensure future prosperity, the regional innovation system must produce or assume a new developmental paradigm through a deep economic, institutional, and social transformation.

capital. The creative capital, to a large degree, determines the ability to produce meaningful new forms (e.g. technological, social and behavioral) or, under less favorable circumstances, the ability to creatively adopt such new forms produced elsewhere.

If one accepts this logic, the fundamental question is the question of relevance of the creative class thesis for peripheral regions. Florida and followers are urban policy consultants and protagonists of urban growth, who have little to say about 'hopeless places' in the periphery. As much as it causes intraurban inequality (Peck 2005), the script of creative-driven development exacerbates regional inequality and unevenness. The 'traditional' creative class thesis in its urban-elitist interpretation draped into North American metropolitan cultutralism (as presented by Florida) may have limited use for peripheries. However, as I argued before, the idea of the creative class as revitalizing force may have a profound utility *beyond metropolis*.

The centrality of the creative class in regional reinvention in the periphery, in terms of breaking with path-dependency and facilitating regional break-through, seems to be striking. Locality and innovation systems research conducted in peripheral areas points to an important role of creativity (and the creative class) in non-central areas. For example, the recent extensive study of local innovation in the Scandinavian North stresses "the importance of key local actors in innovative processes that take place in remote regions". The authors conclude, "almost every innovation has had a clear core agent to manage the process. Very often this agent, initiator and 'engine' of the process has been a local person, who has committed him/herself to the development of a new idea" (Aarsæther 2004: 244). Similar evidence has been cited in other marginal regions (e.g. Hayter et al 1994; Stohr 2000), where members of the creative class, particularly entrepreneurs and inventors, have been credited with revitalizing economies in their communities. All these suggest that the creative class is an important and organic ingredient of local development in the periphery.

The creative class's place and role in regional development in non-metropolitan areas is likely to be different from the metropolis, but, arguably, not less vital. The creative class in the periphery does not contribute to the economic growth merely by knowledge-production and high-end consumption, but by delivering new ideas and rebuilding institutional frameworks of economic development. Along these lines, I argue that the role of the creative class in peripheral setting will differ from conventional "Floridian" views.

To date the specific evidence on relationships between the creative class and economic development in non-metropolitan areas has been limited, if not absent. Both, the work that supports Florida's theses (Florida 2002b, 2005; Gertler et al 2002) and disputes them (Glaeser 2004; Peck 2005; Markusen 2006; Shearmur 2007) is drawn from research in metropolitan centers or at least in cities. Only recently rural and peripheral areas have been included into the orbit of the creative class research. Whereas the results of this initial analysis are far from conclusive, they indicate that major conceptual links between the creative class and development are present in the periphery and worth further exploration, although methods of analysis should be sensitive to the non-metropolitan context (McGranahan and

Wojan 2007).

Based on what I argued earlier, it is my premise that the *creative class* in the periphery *matters*, although this is far from being a final conclusion. Again, the purpose of the following exploratory analysis is to collect evidence, and, first of all, to measure the creative class in the periphery. It may be argued that smaller towns and peripheral communities may benefit from participating in the competition for the creative class, although in different forms and to a different degree than metropolitan centers (McGranahan and Wojan 2007; Scott 2006). This thesis, however, requires further extensive corroboration from critical case studies and empirical analysis, which initial steps I undertake in this paper.

Methodology: Creative Class Metrics In The Canadian Context

Despite ever-growing creative class literatures, the definition of the creative class remains ambiguous. In Florida's own writings, his implicit notion of the creative class varies from 'young and restless' urban techno-elites to anyone who produces some knowledge for money (Florida 2002b, 2005). The creative class remains a vague socio-occupational category, most commonly defined as a group of individuals who either possess high levels of education and/or are engaged in creative (scientific, artistic or technological) types of activities.²

In order to better define terms of reference for the further analysis, I offer a *two-ring-four-sector* conceptual representation of the creative class (Figure 1). The heart of the creative class is formed by the 'super-creative core' – those "scientists, engineers, professors, artists, writers, 'cultural' figures, [etc., who] produce new forms or designs that are readily transferable and broadly useful" (Florida 2005: 34). The outer ring includes other creative professionals, whose work involves creative problem-solving. Since knowledge and creativity may take different forms (e.g. Asheim and Gertler 2005), the creative class is heterogeneous. Based on types of creative activities, the creative class could be subdivided into four major 'sectors': Scientists (including social and applied scientists, computer programmers, and skilled health workers), Bohemia, Leaders and Entrepreneurs. This approach extends the creative class beyond just highly educated individuals or high-tech employees.

The creative class is an open and mobile system, and it requires certain 'ecological' conditions in place to be sustainable. This brings in the major Florida's argument (that I term 'ecological'): he argues that competitively advantaged regions must be continuously attractive (ecologically favorable) to the members of the

2. Many critics argue that Florida's embodiment of creativity in the 'creative class' (defined on the occupation/education basis) is less than appropriate (Markusen 2006) and that the term 'class' is misused. In this study, I make no attempt to assert Florida's application of the term, but merely use it to describe creative labour force, since a more useful term has yet to be offered.

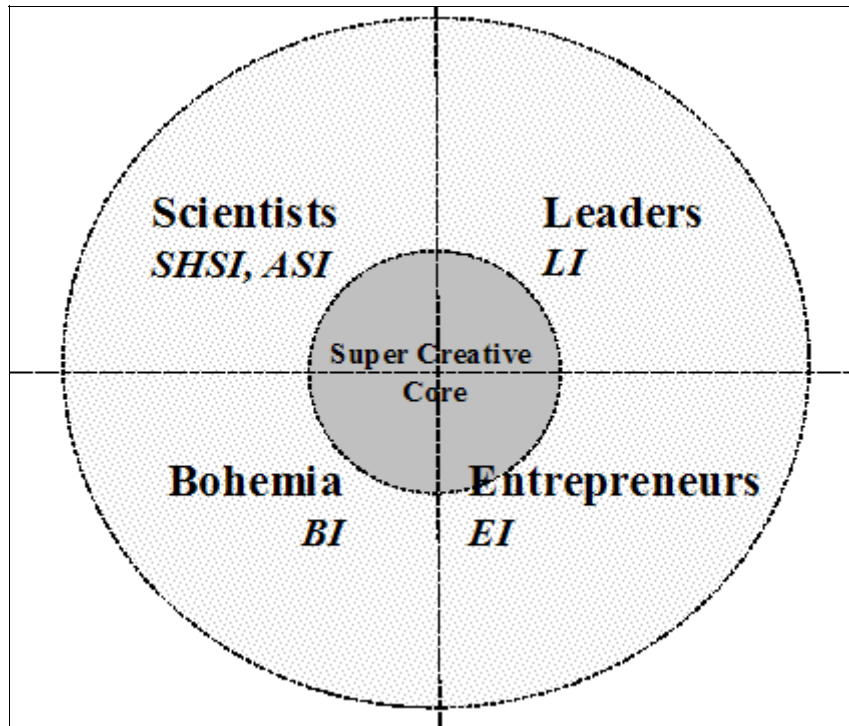


FIGURE 1 Two-Ring-Four-Sector Composition and Measures of the Creative Class
BI – Bohemian Index, EI – Entrepreneurship Index, LI – Leadership Index, SHSI – Science and Health Service Index, ASI- Applied Science Index.

creative class. He associates favorable conditions with the “*quality of place*” - a combination of the 3T’s – technology, tolerance and talent (Florida 2002b), although other social, economic and environmental factors may also be significant (Florida and Gates 2001; Desrochers 2001). The balance among ‘ecological’ factors is also imperative: competitive communities must offer a variety of conditions, i.e. must truly be ‘sticky places’.

Richard Florida and followers offered several methods of estimating the creative class strength and the attractiveness of city-regions. They developed series of indices to quantify the creative capital and measure places’ ability to accumulate it, including a composite “creativity index” (Florida 2002b). In particular, levels of technological advancement (e.g. the Tech-Pole Index), diversity (Melting Pot Index, Gay Index), workforce education (Talent index) and cultural amenities (as represented by the Bohemian Index,) are considered good indicators of both regional creative potential and competitiveness. These parameters were found to correlate with the size of the creative class, the amount of high-technology output, the rate of economic growth and accumulation of wealth (see Florida (2002b) for the USA and Gertler et al (2002) for Canada).

However, given the two-ring-four-sector definition of the creative class

adopted in this paper, I suggest considering a more elaborate system of indices – the *creative class metrics*. This system closely follows the four-sector structure of the creative class. It also isolates the creative class characteristics and pull-factors (or ‘quality of place’ or attractiveness indicators). While keeping traditional indices (representing 3 T’s) in place, this paper introduces four separate indices, which describe specific groups of the creative class (entrepreneurs, leaders, scientists and bohemia), and indices that measure diversity and tolerance. In addition, I offer two composite indices: the Quality of Human Recourses Index and the Creative Class Estimate. This is an attempt to design comprehensive measures of the creative class, based on both educational and occupational characteristics.

The majority of creative class indices are occupation-based. There have been different attempts to identify occupational categories that would be most useful. This paper adopts the Canadian National Occupation Classification (NOC). All developed indices use Canadian Census data. Thus, they could be applicable at any level of spatial aggregation available through Census. However, the limitations of Census data disallowed using some indices, most notable the Gay Index. Instead, a alternative index measuring tolerance (the Women Leadership Index) was developed and used.

All indicators in the system of metrics used in this paper are defined as location quotients (LQ), not shares, as in Florida (2002b) and Gertler et al. (2002). LQ is a more advantageous and meaningful measure, because it compares all regions (communities) with a single common denominator, whether a national benchmark or some other chosen indicator.³ All measures are computed for labour force 15 years and over. See also Appendix 1 for the list of considered occupational groups.

The following creative class metrics are utilized in this analysis:

- **Talent Index (TI)** – is a LQ of the population over 20 years of age who have a university degree.
- **Bohemian Index (BI)** – is a LQ of the employment in artistic and creative occupations (occupations listed under NOC group F.)
- **Leadership Index (LI)** – a LQ of people with leadership and managerial occupations (National Occupation Classification (NOC) group A);
- **Entrepreneurship Index (EI)** – a LQ of people with business occupations (NOC group B);
- **Science and Health Service Index (SHSI)** – a LQ of people with occupations in applied and natural science (NOC group C), health (D0, D1, D2), social science, government service and religion (E0, E1).
- **Applied Science Index (ASI)** – a subsection of SHSI that include only occupations in applied and natural science.
- **Quality of Human Resources Index (QHRI)** – an integral indicator that combines the educational and professional characteristics of population and

3. The conventional formula for calculating LQ is $LQ_i = \lambda_n / \lambda_c$ where LQ_i is a location quotient of phenomenon i (occupation, education, etc.), λ_n is the share of population having the measured characteristic i in region n and λ_c is the share of population having the same characteristic in the reference region (Canada).

is defined and a half-sum of the proportions of people with university degree and a creative occupation

$$QHRI_i = 0.5 \sum (\lambda_{uni}^i ; \lambda_{cr.occup}^i) \quad (1)$$

QHRI measures the degree to which the region's labour force is has university education and engaged in creative professional activity. The index balances (“averages”) educational and occupation parts of the creative class pool and helps to alleviate the occupational bias of the traditional creative class definition. Thus, it is a better alternative to occupation-only creative class measures. Perhaps, it could be considered a proxy of the creative class professional “quality”.

Creative Class Estimate (CCE) – is an attempt to devise an estimate of the creative class share in the labour force by using the concept of probability.⁴ CCE is defined as the probability (P) of individuals in a given labour force to *either* possess university degree ($P_{(uni)}$) *and/or* have a creative occupation ($P_{(cr.occ.)}$).⁵ Probabilities are derived from the proportion of each group in the labour force:

$$CCE_i = P_{i(uni)} + P_{i(cr.occ)} - kP_{i(uni)}P_{i(cr.occ.)} \quad (2)$$

Since a person can have both university education and creative occupation, the probability to have both simultaneously has to be subtracted from probability to be in either of the two groups. However, the term $P_{i(uni)}P_{i(cr.occ.)}$ reflects the probability of both characteristics to coincide under conditions of randomness and independence. In reality, education and creative occupation are correlated, and the empirical likelihood of coincidence is higher than given by $P_{i(uni)}P_{i(cr.occ.)}$. To address this problem I introduced an adjustment coefficient k . It is an empirical coefficient estimated by comparing statistical and empirical probabilities of coincidence between university education and creative occupation, derived from the public use microdata files cross-tabulations (Statistics Canada 2006). For Canada, k is 2.25, i.e. the observed likelihood of a university graduate to have a creative occupation is 2.25 times higher than at random. This coefficient is included into the formula to improve the accuracy of the estimate. CCE measures the likelihood that people have *either* higher education and/or creative professional activity, i.e. are the *members of the creative class*. Expressed in percentages, the index appears to be the most comprehensive measure of the creative class share in the labour force.

Tech-Pole Index (TPI) was used by Florida (2002a) as an indicator of a region's specialization in high technology industries. It does not measure the

4. I am indebted to one of the reviewers for suggesting this idea.

5. Including NOC A0, A1, B0, B1, C0, C1, D0, D1, D2, E0, E1, F0 and F1 (see Appendix 1)

creative class directly, but characterizes its technological productivity. The TPI, as originally proposed, is based on the high technology industrial output. However, in the current context, the TPI is calculated as the LQ of the employment in North American Industry Classification System (NAICS) high technology sectors (information and cultural industries and professional, scientific and technical services).

This study also isolated ‘ecological’ *pull-factors* that help to attract and retain the creative class, including the traditional elements of the Florida’s framework: Mosaic and Bohemian indices (note that the Bohemian Index has a dual role of both characterizing the creative class itself and serving as the attractiveness factor). Instead of the Gay Index, for which data in small peripheral communities is unavailable or highly erratic, I used the Women Leadership Index. To explore whether resource-dependency may be a push-factor for the creative class, I added the Resource Dependency Index. The analysis adopted the following ‘quality of place’ metrics:

- **Mosaic Index** – is a LQ of the total population that is foreign-born. It is a recommended measure of tolerance and diversity (analogous to the Melting Pot index and used by Gertler et al, (2002).
- **Visible Minority Ratio (VMR)** – another indicator of tolerance represented by the LQ of visible minorities in total population. It seems to be a more explicit indicator of diversity and openness than the Mosaic Index;
- **Women Leadership Index (WLI)** – a LQ of women in managerial (leadership) occupations (NOC group A0, A1). It is designed as an indicator of low barriers of entry and society openness. This index may be considered as a substitute for the Gay index used in earlier studies (Florida and Gates 2001), but this link has to be further substantiated.
- **Resource-dependency Index (RDI)** – a LQ of employment in the occupations unique for the primary sector. It is expected to show if there is a relationship between the degree of resource-dependency and creativity potential. It is the indicator of economic peripherality of the frontier, and is expected to be negatively related to creativity.

Index-based ranking is the most common methodology in the broad-area comparative regional studies. Component-based and composite ranking has been used in existing classifications (e.g. Florida 2002b, Gertler et al 2002; Polèse and Tremblay 2005; Tremblay 2002). In this study, I apply a similar approach to explore both the national creative class geographies and smaller-scale geographies in the Canadian North. First, I calculate and analyze the creative class metrics for 288 Canadian Census divisions to obtain the full picture of their geographic distribution. I produce and discuss two rankings: one for the creative class (combining rankings of TI, BI, LI, EI and SHSI) and another for the creative class pull-factors (combining rankings of WLI, Mosaic index, BI, VMR and RSI). The ‘traditional’ Talent Index, HPI and BI indices are used as benchmark variables to assess validity, reliability and performance of the newly developed measures (by statistical reliability tests and cross-correlations). Then, dwelling on detected patterns, the same set of indices is computed for 34 communities in the Canadian

North to provide a more detailed picture of the creative class in the periphery. While exclusively quantitative approach has received criticism for its excessive emphasis on statistical associations at the expense of qualitative assessment (Glaeser 2004; Peck 2005; Markusen 2006), the goal here is to conduct an exploratory empirical analysis. Quantitative indices are designed to assist in evaluating the utility of the creative class approach in the context of the Canadian northern periphery. Further qualitative study will be required to substantiate these findings.

Study Areas: 288 Regions and Thirty-Four Northern Communities

This study applies the creative class metrics at two scales. At the national scale, the analysis incorporates 288 Census divisions (CD). Another application deals with the Canadian North. The North includes three northern territories and northern portions of seven provinces, in which 34 largest communities are selected using criteria offered by Bone (2003). See Figures 2 and 3 for reference. All data were obtained from the Statistics Canada's 2001 Census database (Statistics Canada 2002).

Results and Discussion

Canada: regional geographies of the creative class.

This section discusses the creative class metrics for Canadian 288 CDs. The analysis starts with establishing the validity and reliability of measures and continues with identifying broad geographies of the creative class with specific focus on the Canadian northern periphery (as compared to other regions). I finish by introducing the ranking of CDs based on the creative class and attractiveness measures.

To assess reliability and consistency of statistical tests were run with the assumption that TI, BI, TPI, and Mosaic Indices are the representative 'traditional' measures in the Florida's 3T's system (Florida 2002b, 2005; Gertler et al 2002). Cronbach's alpha test demonstrated a high degree of inter-item correlation (alpha around 0.9) among 'traditional' and newly developed indices, thus, suggesting that they both measure identical process(es). Kendall's coefficient of concordance also indicated a considerable degree of intragroup consistency among creative class and attractiveness measures. For the creative class measures (TI, TPI, LI, BI, EI, and SHSI) Kendall's W was 0.48, and for pull-factor measures (Mosaic, WLI, VMR, RDI) Kendall's W was 0.66. These results suggest that the system of measurement is reliable and consistent at acceptable levels. However, it is also notable that lower concordance among creative class metrics may stem from the deliberate attempt to diversify measures to represent four major creative class groups, not all of which are directly associated with educational attainment or high-tech employment (as in the Florida's model).

Another set of tests was introduced to eliminate redundancies in the metrics.

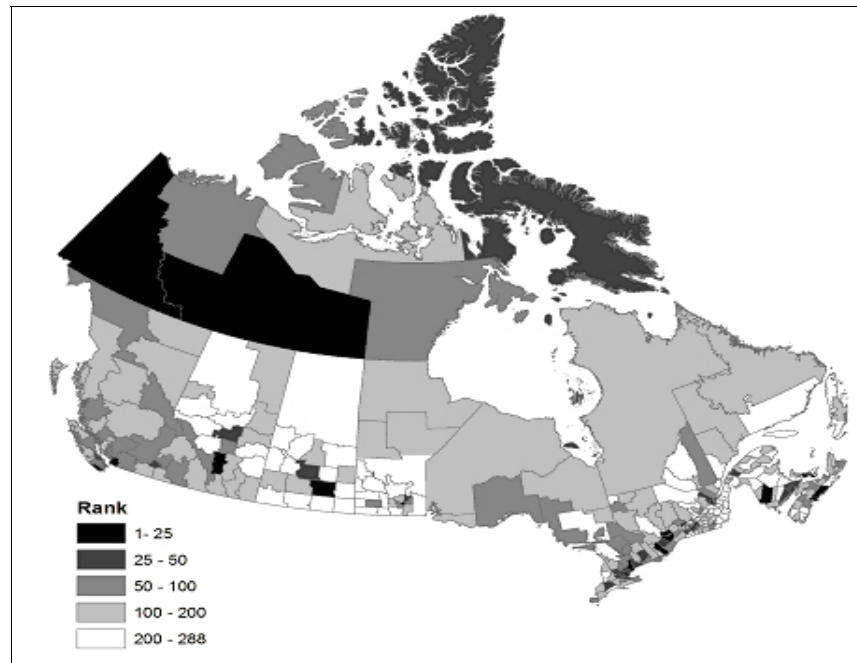


FIGURE 2 Creative Class Ranking of Canadian Regions (Census Division Level)

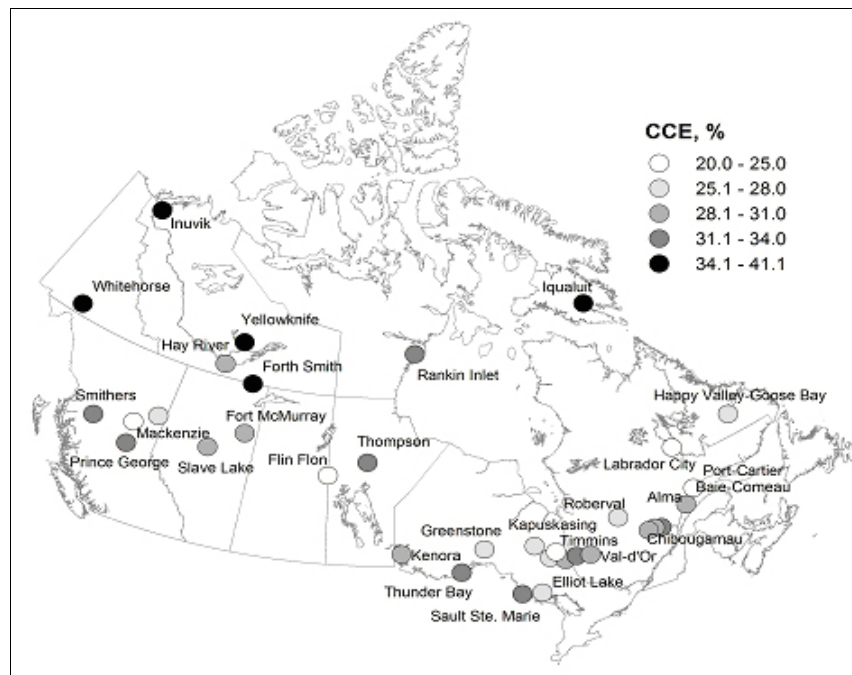


FIGURE 3 Creative Class in Selected Communities of the Canadian North (Creative Class Estimate (CCE), %)

TABLE 1 Correlation Matrix of Creative Class Metrics (Census Division Level)

	TI	TPI	Leader Index	Ent. Index	BI	SHSI	QHRI	CCE	Mosaic Index	VMR	WLI	RDI
TI	1	.829	.695	.656	.632	.674	.927	.945	.658	.637	.683	-.383
TPI	--	1.000	.730	.804	.654	.663	.892	.830	.644	.653	.772	-.552
Leader Index	--	--	1.000	.590	.576	.503	.773	.706	.572	.450	.784	-.477
Ent. Index	--	--	--	1.000	.475	.584	.814	.703	.424	.466	.646	-.613
BI	--	--	--	--	1.000	.589	.709	.708	.407	.402	.619	-.461
SHSI	--	--	--	--	--	1.000	.826	.847	.274	.318	.593	-.616
QHRI	--	--	--	--	--	--	1.000	.995	.579	.574	.776	-.589
CCE	--	--	--	--	--	--	--	1.000	.567	.545	.702	-.522
Mosaic index	--	--	--	--	--	--	--	--	1.000	.888	.527	-.280
VMR	--	--	--	--	--	--	--	--	--	1.000	.529	-.269
WLI	--	--	--	--	--	--	--	--	--	--	1.000	-.481
RDI	--	--	--	--	--	--	--	--	--	--	--	1.000

Note:

- All coefficients are significant at the 0.01 level (2-tailed).
- TI = Talent Index; TPI = Tech Pole Index; Ent. Index = Entrepreneurship Index; BI = Bohemian Index; SHSI = Science and Health Service Index; QHRI = quality of human resources index; CCE = creative class estimate; VMR = visible minority ratio; WLI = women leadership index; RDI = resource-dependency index.

T-tests, principal components analysis and collinearity diagnostics did not detect any explicit redundancies. Despite some evidence of covariance among indices, all of them produced statistically distinct results. This may serve as an additional argument to support the claim that the creative class metrics, adopted here, measures the *same* phenomenon (i.e. the creative class), but characterizes its *different* components.

Relationships among indices (within groups, as well as between creative class and attractiveness measures) may be further investigated by the cross-correlation analysis. Although this method does not shed light on causality, it is informative as an exploratory tool to detect (or reject) possible relationships.⁶ According to Table 1, there is evidence of strong inter- and intragroup associations within the metrics system, with strengths and signs similar to reported in previous studies (Gertler et al 2002). The TI and TPI demonstrate close association, suggesting a link between the level of workers' schooling and concentration of technology-intensive industries. Interestingly, the TPI strongly correlates with all occupation-based measures, especially the EI and LI, thus showing that the development of high-tech sector is associated with various creative class groups, not exclusively

6. "Suggestive correlations" as an instrument of exploratory analysis have been successfully used in previous studies beyond Florida's own research (e.g. Gertler et al 2002, Polèse and Tremblay 2005).

with highly educated applied science workers (Table 1). Secondly, all indices (both traditional and new) demonstrate the high degree of cross-correlation. The correlation results in Table 1 also support the idea of *clustering* among different groups of the creative class. Expectedly, the association between formal education (TI) and creative occupations is very high, i.e. the creative class, despite its diversity, is highly educated.

There is considerable correlation between the pull-factor indices and the creative class indices. The magnitude and signs of detected relationships are similar to reported in other case studies (e.g. Gertler et al 2002). It confirms that the creative class tends to concentrate in open and cosmopolitan, non-resource-dependent places. Especially noteworthy is the performance of the WLI, which has strong correlations with all creative class indicators. In fact, the WLI is the best predictor of all creative class indicators (Table 1), better than the Mosaic Index and VMR. Therefore, the Women Leadership Index may be considered a useful indicator of attractiveness for the creative class in future studies, although the nature of this relationship needs to be further investigated.

QHRI and CCE are also highly correlated with other creative class measures. Notably, the integral QHRI demonstrates higher correlation with the TPI than any individual creative class index. Perhaps, CCE is interesting to consider more closely, because it serves as an estimate of the creative class share in the labour force. CCE for Canada is 0.339, indicating the 33.9% probability of Canadians to belong to the creative class. In other words, according to the CCE, the creative class constitutes one third of the Canadian labour force (same as in the US (Florida, 2002b)). The CCE varies from 43.6% in Ottawa and 41.2 in Toronto to 14.9% in Les Etchemins, QC. Among peripheral areas, Yukon and Fort Smith Region top the list with 35.4 and 35.0% respectively. The median for all 288 regions is 24.8%.

The next step of analysis is to rank all 288 CD by combining individual ranks of their respective creative class indices: (TI, LI, BI, EI, and SHSI) (see Figure 2 and Table 2). All indices are given equal weights. The results of the creative class ranking are both expected and intriguing. First of all, the overall rank distribution is in line with previous findings and clearly demonstrates the supremacy of major metropolitan areas: Ottawa is ranked first, Toronto and its suburban regions (York and Halton) are ranked 2nd, 3rd and 4th, followed by Montréal's Lajemmerais Division and BC's Capital Region (Table 2). This distribution closely follows the previously published results (FCM, 2002; Gertler et al 2002).

It is more intriguing to observe the geographic distribution of ranks across all regions (Figure 1). According to these results, the creative class is concentrated in metropolitan areas, and its strength rapidly diminishes towards the periphery. Clearly, there is a large portion of peripheral Canada, where creative class is extremely weak. However, this would-be expected distribution is decisively broken in the northern frontier, where regions demonstrate high rankings, almost comparable to metropolitan areas. Yukon and Fort Smith divisions have been ranked 15th and 16th respectively, being the only non-metropolitan regions among top 20 divisions. Nunavut has also been ranked relatively high, as well as remote regions in the provincial North. It is remarkable that several deeply peripheral regions are ranked consistently high based on each individual creative class metric,

TABLE 2 Creative Class Ranking of Canada's Top 25 Regions (Census Division Level)

Rank	Ranking 1: creative class	Ranking 2: creative class 'pull-factors'
1	Ontario - Ottawa Division	Ontario - Toronto Division
2	Ontario - Toronto Division	Ontario - York Regional Municipality
3	Ontario - York Regional Municipality	Ontario - Ottawa Division
4	Ontario - Halton Regional Municipality	Ontario - Peel Regional Municipality
5	Quebec - Lajemmerais	Quebec - Com.-Urbaine-de-Montréal
6	British Columbia – Capital Regional District	Ontario - Halton Regional Municipality
7	Quebec - Les Collines-de-l'Outaouais	BC - Greater Vancouver Regional Dist
8	Nova Scotia - Halifax County	Ontario - Durham Regional Municip.
9	Quebec - Communauté-Urbaine-de-Montréal	Quebec - Champlain
10	Alberta - Division No. 6 [Calgary]	Quebec - Laval
11	BC - Greater Vancouver Regional District	BC - Capital Regional District
12	New Brunswick - York County	Manitoba - Division No. 11 [Winnipeg]
13	Quebec - La Vallée-du-Richelieu	Ontario - Waterloo Regional Municip.
14	Quebec - Com.-Urbaine-de-l'Outaouais	Alberta - Division No. 6 [Calgary]
15	Yukon Territory	Ontario - Middlesex County
16	Northwest Territories – Fort Smith Region	Alberta - Division No. 11 [Edmonton]
17	Quebec - Champlain	Nova Scotia - Halifax County
18	Quebec - Les Pays-d'en-Haut	Ontario - Hamilton Division
19	Quebec - L'île-d'Orléans	Quebec - Com.-Urbaine-de-l'Outaouais
20	Saskatchewan – Division No. 6 [Regina]	Ontario - Wellington County
21	Quebec - Communauté-Urbaine-de-Québec	Ontario - Dufferin County
22	Quebec – Thérèse-De Blainville	Yukon Territory
23	Ontario - Frontenac County	BC - Squamish-Lillooet Regional Dist
24	Manitoba - Division No. 11 [Winnipeg]	Quebec - Roussillon
25	Prince Edward Island – Queens County	BC - Central Okanagan Regional Dist

most notably on SHSI, LI and BI (and somewhat less on TI and EI).

Indices that reflect creative class pull-factors exhibit a very similar spatial pattern, with high ranks reserved for major metropolitan areas (see Table 2). The overall ranking was performed by combining the Mosaic Index, WLI, VMR, RDI and BI (equally weighted). Very cosmopolitan Greater Toronto Area, Montréal and Vancouver dominate the top 25, again suggesting a link between the 'quality of place' and the creative class. Interestingly, 25 top-ranked regions demonstrate greater geographic variety than in case of the creative class ranking, and include some second-tier cities and even non-metropolitan districts. For example, the Yukon Territory ranks 22nd and BC's "Silicon vineyard" in central Okanagan ranks 25th. This is encouraging, since it shows that peripheral regions can be attractive, or can become attractive to the creative class.⁷ However, most of peripheral, especially deeply rural areas remain at the bottom of the list, and can offer little to compete for the creative class.

The preliminary conclusion from these findings is that some areas in the Canadian periphery, and particularly in the North, are creative capital rich, and, thus, may be creative capital 'hot spots' rather than 'hopeless places' as we would have though following Florida's logic. Moreover, the top-ranked peripheral areas

7. See Aguiar et al (2005) for an informative account on 'creative place'-making in the Okanagan region.

rank high in all individual indices, although they may lag on formal education and entrepreneurial components. However, it is naïve to argue that regional-level analysis provides an adequate representation of the creative class distribution in the periphery. Most frontier creative class is likely to concentrate in few urban areas and, thus, is likely to be strongly spatially clustered. Thus, further analysis should change its spatial focus. In what follows, I apply the creative class metrics system to a sample of 34 northern urban communities.

Canadian North: looking for creative 'hot spots'.

This section provides an abbreviated description of the creative class metrics analysis for 34 northern communities. The full results of this study are to be discussed elsewhere. Before reporting findings, however, some methodological adjustments should be introduced. The preliminary analysis at the CD level hinted that many peripheral areas ranked very high on SHSI (Table 1) This is not surprising, because the SHSI is based on heavily publicly subsidized government occupations (in NOC groups D and E) that tend to be disproportionally distributed in the periphery. This bias would be even stronger in capitals and regional centres serving vast administrative areas in the Canadian North. To alleviate this public sector bias, I replaced SHSI with ASI – a subsection of professional and technical occupations in applied and natural sciences only.

The first objective of this analysis is to compare the behavior of the creative class metrics to the national results (Table 1, Table 3). If associations among indices closely resemble those at the national level, it will be an indication that the creative class 'logic' is applicable to peripheral areas. Table 3 demonstrates that relationships among the creative class indices and 'quality of place' indicators are very similar to those in Table 1. (Note that the lower degree of correlation significance in Table 3 is partially attributable to the effect of smaller sample). The stability of associations indicates that the major relationships are upheld, and the behavior of the creative class metrics is very much alike the rest of the country: the strength of the creative class is associated with 3T's (technology (TPI), tolerance (WLI, VMR) and talent (TI)). The creative class in the periphery shows signs of the intergroup clustering (among LI, BI, EI and ASI) and association in the same manner as at the national scale. The only noticeable difference is the failure of traditional diversity indicators, the Mosaic Index and VMR, to be reliable predictors (most likely because peripheries lack both foreign-born populations and visible minorities). In contrast, a robust performance of the WLI is encouraging: strong women leadership (which may be considered a good indicator of openness and tolerance) is associated with the strong creative class. Another notable difference is the weaker relationship of all creative class indicators with the TPI. It would be interesting to further explore whether it means that the technology production in the periphery is less 'creative' (e.g. because knowledge is imported from outside), and whether the high-tech labour force in the North is less educated.

Given that applicability of the creative class analytical framework to northern communities appears to be confirmed, it is possible to proceed with exploring

TABLE 3 Correlation Matrix of Creative Class Metrics (Northern Communities)

	TI	TPI	Leader Index	Ent. Index	BI	ASI	QHRI	CCE	Mosaic Index	VMR	WLI	RDI
TI	1	.692	.563	.633	.701	.636	.890	.929	.356	.369	.360	-.521
TPI	--	1.000	.579	.697	.596	.545	.735	.705	.531	.379	.429	-.398
Leader Index	--	--	1.000	.723	.743	.354	.817	.702	--	--	.886	-.432
Ent. Index	--	--	--	1.000	.644	.537	.849	.722	--	.340	.485	-.587
BI	--	--	--	--	1.000	--	.819	.766	--	--	.597	-.472
ASI	--	--	--	--	--	1.000	.613	.605	--	.486	--	--
QHRI	--	--	--	--	--	--	1.000	.947	--	--	.622	-.575
CCE	--	--	--	--	--	--	--	1.000	.357	.343	.524	-.558
Mosaic Index	--	--	--	--	--	--	--	--	1.000	.694	--	--
VMR	--	--	--	--	--	--	--	--	--	1.000	--	--
WLI	--	--	--	--	--	--	--	--	--	--	1.000	--
RDI	--	--	--	--	--	--	--	--	--	--	--	1.000

Note: 1. All coefficients are significant at least at the 0.05 level (2-tailed). Not significant coefficients are omitted. Notations see in Table 1.

2. TI = Talent Index; TPI = Tech Pole Index; Ent. Index = Entrepreneurship Index; BI = Bohemian Index; ASI = Applied Science Index; QHRI = quality of human resources index; CCE = creative class estimate; VMR = visible minority ratio; WLI = women leadership index; RDI = resource-dependency index;;

geographical patterns of the creative class. Figure 3 illustrates the CCE for each of 34 communities. Since the CCE is the integral measure highly correlated with all creative class metrics, its spatial distribution gives a number of important preliminary observations, most of which remained unnoticed at the regional level (Figure 2). First, the creative class is concentrated unevenly, with high clustering in few communities. Secondly, the territorial urban centres, especially capitals, have particularly high number of creative and educated workers, exceeding the national figure (33.9%). Thirdly, the frontier communities perform generally better than less distant ones. Fourthly, there is a divergence between single-industry resource towns, diversified commercial and administrative centres, and 'Aboriginal' communities.

Table 4 contains two rankings of 34 northern communities. The first ranking is derived by combining equally weighted rankings of the creative class indices (TI, LI, EI, BI and ASI). The group of six leading communities emerges at the top of the rating: Yellowknife, Whitehorse, Iqaluit, Fort Smith, Smithers, and Inuvik. Noticeably, most of them are regional centres in the Territories, whereas cities in the Near North rank quite low (e.g. Timmins, Kenora, Thompson). This finding again reveals a puzzling pattern that remoteness may be a positive factor for the creative class, whether because it stimulates the local leadership, entrepreneurship and the rise of 'domestic' creative class, including Aboriginal, or because the

TABLE 4 Creative Class Ranking of Selected Communities in the Canadian North

Rank	Ranking 1: creative class	Ranking 2: creative class 'pull-factors'
1	Yellowknife	Whitehorse
2	Whitehorse	Yellowknife
3	Iqaluit	Inuvik
4	Fort Smith	Elliot Lake
5	Smithers	Iqaluit
6	Inuvik	Smithers
7	Rouyn-Noranda	Rankin Inlet
8	Rankin Inlet	Thunder Bay
9	Thunder Bay	Fort Smith
10	Slave Lake	Prince George
11	Chicoutimi-Jonquiere	Fort McMurray
12	Hay River	Hay River
13	Val-d'Or	Sault Ste Marie
14	Prince George	Kenora
15	Baie-Comeau	Slave Lake
16	Sault Ste Marie	Kirkland Lake
17	Fort McMurray	Thompson
18	Kirkland Lake	Fort St. John
19	Alma	Mackenzie
20	Thompson	Rouyn-Noranda
21	Happy Valley-Goose Bay	Kapuskasing
22	Elliot Lake	Labrador City
23	Kenora	Timmins
24	Fort St. John	Baie-Comeau
25	Timmins	Greenstone
26	Kapuskasing	Chicoutimi-Jonquiere
27	Labrador City	Val-d'Or
28	Chibougamau	Flin Flon
29	Mackenzie	Happy Va
30	Roberval	Alma
31	Flin Flon	Iroquois Falls
32	Iroquois Falls	Roberval
33	Port Cartier	Chibougamau
34	Greenstone	Port Cartier

creative class from the near periphery has drained to closely located metropolitan areas. The second tier of communities includes towns from Rouyn-Noranda to Baie-Comeau (ranked 7th to 15th). These centres have limited creative capital, but still are not 'hopeless places'. The rest of communities have a very small creative class.

The analysis of the creative class structure provides evidence of both *inter-group clustering* and *disproportions*. The North most seriously *lacks the entrepreneurship and leadership components* of the creative class: only a few northern communities have a considerable entrepreneurial class. Clustering of bohemia (BI) is more evident than of talent (TI): five top communities (Iqaluit, Whitehorse, Yellowknife, Rankin Inlet, and Fort Smith) concentrated almost 16% northerners with artistic occupations. The distributions of the ASI is strongly tilted to industrial communities (e.g. Fort McMurray and Thompson), which, however, lack other creative class groups.

The attractiveness (pull-factor) ranking (Table 4) is computed by combining individual pull-factor rankings (Mosaic, WLI, VMR, RDI, and BI which, again, were given equal weights). First five places in this ranking are occupied by the same communities that already have high creative class rank. Whitehorse, Inuvik, Yellowknife, Smithers, Iqaluit, and Rankin Inlet top the list (the only surprise was the high rank of northern Ontario retirement community of Elliot Lake). These results reiterate the unevenness in the distribution of the pull-factors in the North. However, they also point to several centres, which could be potentially attractive to the creative class.

In sum, both rankings (Table 4) illustrate a remarkably uneven geography of the creative class in the northern Canadian periphery. Although supporting our earlier findings, which pointed to higher-than-expected levels of the creative class strength and availability of pull-factors in the frontier, the municipal-scale analysis shows that only few communities actually possess these features. Many of the leading places (albeit not all) are privileged economically or politically (capitals, regional or self-government centres). These and other typological differences in the sample are also intuitively evident. For example, both creativity and attractiveness indicators reveal the advantage of territorial capitals. Capitals are diverse and economically successful places, almost like miniature versions of Florida's creative cities. They dwell on their thriving public sector that creates high-skilled well-paid jobs and a dynamic social environment, both attractive to the creative class. Industrial towns (e.g. Fort McMurray, Rouyn-Noranda and Thompson) score relatively high on technical occupation measures, but have a low profile in others. In contrast, Aboriginal communities usually have good standing on bohemia, leadership and entrepreneurship indices, but perform poorly in terms of technical occupations and the formal educational level of population.

Cluster analysis (*k*-means method) was employed to determine whether distinct types of communities could be identified (based on the TI, BI, LI, EI and ASI and population size as variables). Clustering detected five types of communities. The most creative regional centres (Whitehorse, Yellowknife, Smithers, Inuvik and Fort Smith) comprised the first group. Another three groups represented different types of *industrial towns*: larger cities with modest creative capital

(Baie-Comeau, Chicoutimi-Jonquiere, Fort McMurray, Prince George, Sault St Marie, Slave Lake, Thunder Bay, Rouyn-Noranda, Timmins, and Happy Valley-Goose Bay) and two groups of progressively smaller single-industry towns with weak and very weak creative class respectively. Iqualuit and Rankin Inlet formed their own cluster. This cluster, perhaps, may be associated with Aboriginal bohemianism and local leadership, since it had strong bohemianism, leadership and entrepreneurship components of the creative class, but weaker talent and science components. This typology, alongside the overall ranking, appears to be instructive for furthering our knowledge about geography and ecology of the creative class beyond metropolis. If confirmed by future studies, it may suggest what regions and what types of communities can be the most likely 'hot spots' and could successfully compete for the creative class. Some of these 'hot spots' in their characteristics are very alike metropolitan areas, but others (such as Aboriginal centres) may represent unique cases of 'embedded' creative clusters.

The results of the exploratory analysis seem to indicate two important points. First, the creative class does live in the periphery. Although its geography is spotty and its strength is modest, the seeds of the creative agency are available. Some places, which combine openness and tolerance of the settlement frontier with the expanding market for knowledge production, are competitive at the national level. They also have an ability to attract the creative class. Secondly, this research asserts the relevance of creative class studies beyond metropolis. It demonstrates that key patterns and associations, common for city-regions, largely hold in the periphery. Among such patterns are spatial and intergroup clustering of the creative class, its geographical unevenness and the importance of the 'quality of place' for its behavior.

Conclusions

This paper had three major objectives to address. The first objective was to provide a substantive conceptual reevaluation of Richard Florida's creative class thesis in the context of periphery. The second objective was to adjust and extend the creative class metrics to accommodate the Canadian context and the four-sector approach to the creative class structure. The third objective of the paper was to conduct an exploratory analysis of the creative class geography beyond the Canadian metropolis.

From the outset, I argued that creativity and the creative class are pivotal for the new paths-creation in peripheral regions, no less than in metropolitan regions. I also contended that the four-sector approach provides researchers with more complete and sophisticated understanding of the creative class role in regional innovation and development, and gives a more inclusive and better-structured representation of the creative class itself.

Building on these arguments, the paper introduced the quantitative assessment of the creative class and its pull-factors in 288 Canadian regions. The purpose of this analysis was to identify the place of the peripheral regions in the Canadian national context. I developed and tested a number of new creative class and pull-

factor measures, including measures of each creative class ‘sector’: Science, Leadership, Entrepreneurship and Bohemia. It was shown that new indices demonstrate statistically robust results with a high degree of reliability and concordance. Among the pull-factors of creativity, measures of diversity (Mosaic Index and VMR) were found to be moderately good predictors of the creative class. The WLI (women leadership index) was especially successful as it was the strongest predictor of the creative class (better than traditional Bohemian and Mosaic indices). The QHRI and CCE also demonstrated good performance as the integral measures of the creative class. These two measures, in addition to sector-specific indices, developed in this study, may be recommended for use in future studies.

Empirical findings for 288 Canadian regions suggested that the geographic distribution of the creative capital was uneven and heavily clustered in major urban centres (Ottawa, Toronto, Montréal, Victoria, Halifax, Calgary and Vancouver). However, it also showed a tendency of some, especially more distant frontier regions, to perform exceptionally well in all indicators. This led to another important conclusion that regions beyond the metropolis may have ‘creative hot spots’, which need to be further explored.

Thirty-four northern communities were selected to explore the creative class geography at a different scale. Although the degree of the creative class development in these places was found to be low, the group of six leading communities scored high in all indices. These were localized concentrations of the creative class, mostly associated with regional centres, including Yellowknife, Whitehorse, Iqaluit, Inuvik, Fort Smith, and Smithers. Some communities ranked high on the creative class attractiveness indicators, most prominently Whitehorse and Yellowknife. They and, possibly, Inuvuk, Rankin Inlet and Iqaluit were competitive nationwide, while none of the cities in the Near North was.

The overall results of this study are encouraging. Despite formidable challenges faced by Canadian peripheral regions in fostering knowledge-driven development, peripheral communities are not ‘hopeless places’ fully deprived of the creative class (as one may interpret Florida). ‘Hot spots’ do exist, and could in future serve as centres of regional reinvention, if comprehensive and thorough policies are introduced in support. A special role of the creative class in the periphery makes relevant the attempts by some communities to attract creative people. However, a direct application of Florida’s scripts to peripheral communities does not appear appropriate, since the role of the creative class there may be quite different from metropolitan areas. Perhaps, one may argue that *Homo creativus* in the periphery is not an “atomized subject, apparently, with a preference for intense but shallow and noncommittal relationships” (Peck 2005: 746), but one who is ready to embrace community and cooperatively engage in community building. However, I leave this thought to further studies.

The exploratory nature of this paper suggests its major limitation: by analyzing correlations, it is impossible to explain the substance of observed relationships. However, this type of first-cut analysis is always useful to identify or reject possible associations. The definitional vagueness of the study’s major object – the creative class – also a serious issue. The paper attempted to clarify it, but this work is far from complete. Future studies, both quantitative and qualitative, are neces-

sary to further develop concepts and advance arguments presented here.

Application of the creative class framework to communities beyond Canadian metropolis appears to be an important emerging theme. Contrary to the metropolitan bias, this paper indicates a good chance that further research efforts in this field will be fruitful. Besides, there is a growing demand for such studies from peripheral communities, as they attempt to adjust to the realities of the knowledge-based economy. Careful analysis has to be conducted before any policies are considered, since the blind application of Florida's prescriptions will likely to be fruitless (Scott 2006). There is still little known about the creative class in the periphery. Possible questions may include the relationship between creativity and Aboriginality, between the creative class and non-metropolitan amenities, between the creative class and remoteness, public sector, community sustainability, and between creative and social capital.

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Appendix 1 - Selected National Occupation Classification Categories

Group A: Management occupations

- A0 Senior management occupations
- A1 Specialist managers

Group B: Business, finance and administration occupations

- B0 Professional occupations in business and finance
- B1 Finance and insurance administration occupations

Group C: Natural and applied sciences and related occupations

- C0: Professional occupations in natural and applied sciences
- C1: Technical occupations related to natural and applied sciences

Group D: Health occupations

- D0 Professional occupations in health
- D1 Nurse supervisors and registered nurses
- D2 Technical and related occupations in health

Group E: Occupations in social science, education, gvrnm't service and religion

E0 Judges, lawyers, psychologists, social workers, ministers of religion, and
policy and program officers

E1 Teachers and professors

Group F: Occupations in art, culture, recreation and sport

F0 Professional occupations in art and culture

F1 Technical occupations in art, culture, recreation and sport