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New Economic Cycle in Northern Periphery: A Reading of the First Decade

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« **New Economic Cycle in Northern Periphery¹** »
A Reading of the First Decade

Marc-Urbain Proulx ²

ABSTRACT

Within the vast northern periphery of Quebec, the annual capital almost doubled over the 2000s. This boost of a new cycle of growth coincides with a slowdown in job creation. Such effects on the mode of development is part of a multi-dimensional and transitional movement within global peripheries requested to supply, of their raw materials, high urbanization in emerging economies. According to our analysis, four elements are added to the difficulties of the forest industry to explain the actual structural changes, namely: the technological intensification, the importation of equipment and materials, the commuting workers (fly in - fly out), and the low attractiveness of the manufacturing sector. Our reading leads us to propose two avenues for reflection on real territorial development.

RÉSUMÉ

Au sein de la vaste périphérie nordique du Québec, les immobilisations annuelles ont presque doublé au fil de la décennie 2000. Cette impulsion d'un nouveau cycle de croissance s'inscrit en parallèle avec un ralentissement de la création d'emplois. De tels effets contradictoires en matière de développement semblent correspondre à un mouvement transitoire multidimensionnel au sein des périphéries mondiales sollicitées pour alimenter, de leurs matières premières, la forte urbanisation dans les économies émergentes. À cet effet au Québec, les secteurs économiques nordiques de la construction, de l'extraction, de la transformation et des services réagissent différemment au cours de la période observée. Selon notre analyse, quatre causes s'ajoutent aux difficultés de l'industrie forestière pour expliquer les changements structurels en cours, soit l'intensification technologique, l'importation des équipements et de matériaux, la migration alternante des travailleurs (fly in – fly out) et la faible attractivité du secteur manufacturier. Notre lecture nous conduit à proposer deux pistes de réflexion en matière de véritable développement territorial.

¹ Upon satisfaction of the jury after the corrections, clarifications and additions requested, the text has been selected for publication in the journal *Actualité Économique* in which it will soon be published.

² Professor of Regional Economics at Université du Québec à Chicoutimi during the initial filing of this text for arbitration. During the completion of this text, the author became Associate Deputy Minister for the Ministry of Municipal Affairs, Regions and Land Occupancy. The remarks in this paper reflect the views of the author only.

INTRODUCTION

The expanded metropolisation of population and activities increasingly combines with the formation of "megacities" and "metapolises." This low-density, scattered urbanization, which is widely discussed in scientific literature, is not the only territorial phenomenon that marks the contemporary globalization. Indeed, traditional centripetal forces that currently contribute to the increasing urbanization of the world's population now reaching the 50% ratio, oppose geo-economic forces equally conventional of centrifugal nature. Aside from the urban sprawl by successive crowns in immediate and neighbouring peripheries of urban centres, these centrifugal forces also promote the localization of economic activities in the intermediate, remote and very remote peripheries. In addition, most major peripheries of the planet, such as Siberia, the Amazon, the Outback and Patagonia are currently under considerable pressure in the extraction of natural resources to fuel economic expansion of the central areas of the planet (Auty, 2001; Carroué 2002; Claval, 2003).

In Quebec, the northern peripheries are no exception to this centrifugal movement. During the 2000s, the value of mineral shipments grew 123% in current dollars, under the double effect of the volume delivered and price rise. This sparked a wave of mining investments that has been added to the property granted in hydropower projects. In fact, for the four northern regions³, the statistics show a jump in annual private and public capital, which rose from \$ 4 billion in 2001 to \$ 7.5 billion in 2010, representing a total addition of \$ 17 billion or 38% of the amount injected. They reached the sum of \$ 61 billion for the observed period. The increase shown in Figure 1 appears to initiate the device path to a new cycle for which it is appropriate to focus on a few points. Shedding light on the phenomenon will determine whether it is a new major structural cycle with technological, social, environmental, economic, or political changes, or simply a cyclical rebound without changing the structure of the observed territory. Surely, we are seeing a slowdown in cyclical tendency since 2012, as a result of the financial crisis of 2008. But government of Quebec planners provide continued public and private investments of about \$ 80 billion by 2035 (Quebec, 2011). This reflects perfectly the current trend in global peripheries (Bradshaw, 2010; Sheppard, 2013)

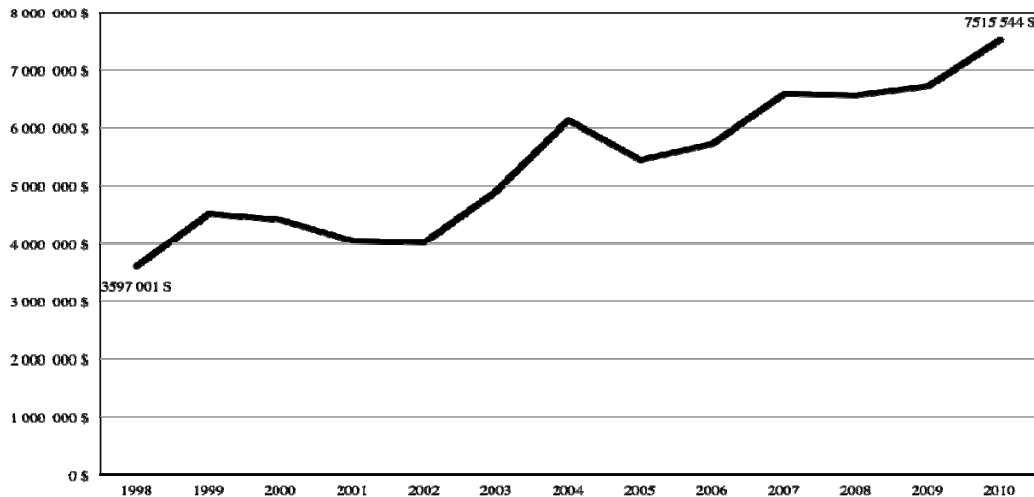
In fact, the recent strong Nordic capitals should continue for a few decades, over the global economic recovery that seems to assert in 2014-2015. Due to the economic emergence (industrialization / urbanization) in certain countries such as Brazil, Russia, India, China and now South (BRICS) Africa, the world market is characterized by a greatly increased demand for raw materials. Considering the general level of relatively low consumption in these populous countries, in rapid industrialization and strong urbanization⁴, the global demand is expected, according to experts, to keep growing for another three to four decades to a minimum annual rate of 4% to 6% , which stimulates the supply. Especially since other national economies show a significant potential economic emergence that would have additional effects on global demand, particularly Thailand, Indonesia, Turkey and Peru where industrialization and urbanization are already highly engaged. Such a global urban and industrial site obviously generates significant demand for commodities, while raising the overall level of consumption over a long period. This, in total, significantly solicits basins and deposits of natural resources from the peripheries of the planet.

³ Abitibi-Témiscamingue, Saguenay-Lac-Saint-Jean, Côte-Nord and Nord-du-Québec.

⁴ According to forecasts by the OECD (2008) and UN (2011), urbanization rate of 40% in Asia and 41% in Africa should each reach beyond 50% by 2030, approaching the global average rise overall by 50% to 60% during the period. It should be noted that to this forecast, the urbanization rate will reach 80% in Europe, 83% in South America, 87% in the United States and 84% in Canada.

Graphic 1 Recent Evolution of Investments: 4 Nordic Regions

Rebondissement actuel des immobilisations nordiques
Périphérie nordique du Québec (CN-NdQ-AT-SLSJ)
(en milliers de dollars enchaînés de 2002)
(Source : ISQ, Traitement : CRDT-UQAC)



Accordingly, the Nordic periphery of Quebec undergoes important pressure towards a multi-faceted transition. For public policy, it becomes very relevant to understand the specific conditions under a general framework (Bradshaw, 2001). This partly explains the renewed interest in the scientific literature, especially in a Canadian context (Hayter and Barnes, 2001; Hayter and al, 2003; Howlett and Brownsey, 2008). Through the well-known observation about peripheral regions which differ from economic models elaborated in central regions, the distinctive attributes of the periphery such as ecology, indigeneity, social acceptability, accessibility to places, and territorial organization are proposed for analysis. When taken into account, they can enrich the overall analysis due to various peripheral experiences. Inspired firstly by Baldwin (1956), and then by Stohr and Taylor (1981), it is increasingly suggested that criteria for graduation can enable positioning on a continuum between the two extremes. On the one hand, there is, to certain degrees, imperialist resource extraction by outside interests (exogenous); on the other, the territorial empowerment on various issues by an internal power (endogenous) to the peripheral territory.

Economic Modeling of the Periphery

Endowment in natural resources (land, forests, mines, marine, energy, etc...) represents the first well-recognized universal cause that attracts economic activities in places and dispersed media periphery to fuel, in raw materials, economies worldwide. Through the mercantilists' perspective, the classical economists have well analyzed this basic factor. In 1923, an economic modeling in Canadian context was proposed by Mackintosh, inspired by the growing importance of the macro-economic theory. According to his reading, economic activities in the periphery begin by attracting extractive industries that perform start-up cumulative growth process.

On such basis, the work of Minville (1934, 1938, and 1943) was used to conduct a systematic inventory of Quebec's natural resources reserves in order to establish a public policy survey of economic activity. Structuring effects generated at Quebec's periphery as elsewhere in Canada, has fuelled theorists in the development of the *staple-led growth* model, or "growth driven by commodities" (Innis, 1930, 1957). A model which was subsequently taken over by Watkins (1977) in order to further isolate the operation while illustrating the best possible real effects on peripheries well-endowed with natural resources. In

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continuation, recent analyzes by Hayter & al (2003) and Silver (2013) are particularly interesting in terms of clear-cut criteria.

In a broad range of various peripheral contexts, three economic components stand out distinctly from our reading of this model of growth and development:

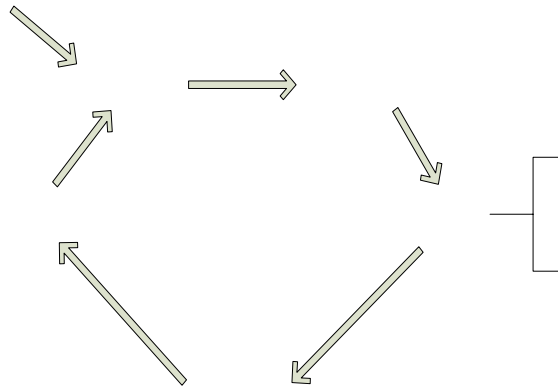
1. Surge in the global demand for resources by major structural cycles which are part of economic cycles;
2. Massive capital at the forefront of technology by large corporations on well-resourced and attractive sites;
3. Financial leakages from local economic circuits and low-economic diversification, maintaining a high level of dependence.

In terms of spatial analysis, the theory of industrial location, originally proposed by Weber (1929) and adopted by Isard (1956), led to understand that in peripheries, various affiliated activities in the production of final goods, including equipment manufacturers, input suppliers, processors, business services or workers, financiers, merchants, etc... Settle according to efficiency criteria that promote dispersal among several key points, notably:

1. Extraction sites scattered over the reserves of resources ;
2. Aboriginal and non-Aboriginal locations, situated near the sites;
3. Sites of transshipment of goods;
4. Major consumer markets of final products;
5. International financial centers with their headquarters.

By refining what is illustrated in the theory of polarization (Boudeville, 1962), it appears that peripheral areas, centrality does not favour the concentration of activities. The vast space is rather structured with access to basins and resource deposits that affect the formation of access corridors from the outposts of transshipment of goods (Vance, 1970).

Diagram 1
Periphery Economic Model



As a result of these economic and spatial terms, production chains in natural resources do not form territorialized clusters of activities as there are in certain industries located in central regions (Proulx, 2002). There are little agglomeration effects that can cause economic accumulation. Only extractors, regular suppliers, several services and certain refining operations of raw materials are confined to a location near basins and deposits of natural resources. Nevertheless, territorial production increases employment, income, consumption and so on. Other activities that shape sectors are located more freely elsewhere across the global space.

Investissement
exogènes

Therefore in peripheries, outposts, whose economy is more diversified, benefit from their privileged position in space to obtain returns generated by the extraction of natural resources. They capture some of the economic leakage from scattered small and undiversified settlements, on the one hand, by providing inputs for mining and / or, on the other hand, by refining the raw materials before delivery. In Quebec, it is the case of Sept-Îles, Havre-Saint-Pierre, Baie-Comeau, Val d'Or, Amos and Saguenay, which, by their strategic location, polarize other activities such as wholesalers, manufactures, specialized services, factories, higher education, large supermarkets, specialized residential facilities, etc., by becoming centers of development of the northern periphery. Their initial multi-functionality and innovation capacity actually feed their economic diversification to some extent by the creation of new sources generating development.

If this mechanism of growth and development corresponds to Harrod - Domar's (Solow 1956, 1994) famous general model, specific features operate within its deployment in peripheries, including very large leakages out of the local circuits. This limits the convincing or generating effects on the scenes of extractions by making institutions economically dependent from punctual pursuit of exogenous capital (Frank, 1968).

Cons

To reduce this well-modelled dependence of peripheries (Holland, 1978; Stöhr and Taylor, 1981), three essential endogenous conditions were isolated. Associated with the classical model of community organization, Friedmann & Weaver (1979) proposed to build on the collective empowerment of means to develop the territory. According to them, it was possible by the territorial coordination of the various functions performed in the various sectors (agriculture, manufacturing, education, commerce, transportation, etc...); to create proximity effects (synergies). They further argued the virtues of selective territorial closure, relying in particular on the retention of cash leakage.

It was also shown that entrepreneurship can make a difference in the degree of economic diversification on already started up peripheral area (Coffey and Polese (1984) and Julien (2005)). More recently, another important factor was derived from the theory to highlight the positive growth and development conditions in peripheral locations. It is a question of learning and creativity in innovative initiatives (Florida, 1995, 2005), especially those concerning institutions that can support the first two endogenous conditions, namely empowerment and entrepreneurship. To this end, the interaction of cognitive capacity among stakeholders of the periphery would be essential.

If these illustrated conditions of endogenous development have helped support and guide public policy in recent decades in Quebec, we have too often anticipated structuring effects in the local economies of the periphery. In reality, the facts show that the major capital granted occasionally in northern peripheries of Quebec creates an economic take-off (and re-launching) on host sites. However, the local economic structure does not change much in terms of diversification, according to the linear model of Rostow (1960).

This territorial economic immaturity due to the difficulty of locally manufactured goods and services (import substitution and transformation of raw materials) is the main aspect that distinguishes the peripheral regions from the central regions. In Quebec, with the exception of Saguenay and Rouyn-Noranda, but also Sept-Îles, Baie-Comeau and Val d'Or to a lesser extent where the critical mass of diverse activities is more important, the structure of local economies in the northern periphery remains largely composed of primary and tertiary activities (Proulx, 2011), without much economic diversification associated with secondary activities. Will the new great cycle begun during the 2000s in northern periphery change this economic order or rather emphasize it?

The Three Areas of the Québec Territory

North of the American continent, structured by its two main megacities (New York - Philadelphia - Washington and Buffalo - Chicago - Pittsburgh), Quebec registers as a peripheral space, itself divided into different areas, including more or less important urban centers of which Montreal appears by far as the most impressive pole center. According to a geo-economic contemporary reading of this periphery, three specific areas gradually and clearly position themselves as distinctive, interdependent and complementary, or metropolitan, north peripheral, and intermediate.

First, there is a central area, economically diverse, covering the St. Lawrence Valley by containing almost 90% of Quebec's population and over 80% of its manufacturing jobs. This polycentric manufacturing area, whose shape resembles a crescent (Proulx, 2006), with one arc (Polese, 2009) or an archipelago (Beudet, 2009), may be designated after Ascher (1995) by the concept of metapolis; Quebec metropolitan form very different from huge urban complexes in Europe, Asia, and even in southern Ontario (Alvergne and Latouche, 2009). Territoriality of the Laurentian metapolis, now better inferred, but still barely modelled, is anchored in three main areas (Montreal - Quebec - Gatineau) whose activities are currently focused beyond their immediate satellites (Longueuil - Laval - Boucherville - Lévis) in places that attract companies wishing to take advantage of agglomeration economies without suffering adverse effects such as traffic congestion, high land prices, wage pressures, etc...

Territorial anchoring of this multipolar economic zone well-connected to the United States and Ontario also relies on high intermediate poles showing relatively high growth (Trois-Rivières - St. John - St. Joseph - Granby - Sherbrooke - Magog - Lac-Mégantic - Joliette - Rawdon - Saint-Sauveur - Waterloo - Mont-Tremblant) and even very high growth (Drummondville - Victoriaville - Saint George - Saint-

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Jérôme - Windsor - Rivière-du-Loup). In addition to these powerful points of support to the metropolitan form, also note the statement of mobility corridors that structure this central multipolar area of Quebec, especially those of Beauce, Laurentides, Basse Mauricie, Estrie, without forgetting the two roads on either side of the river (Proulx, 2012).

According to the conventional geo-economic model called "center - periphery", this metropolitan area, which condenses activities and the population in Quebec, radiates in the vast periphery with its centripetal effects (drainage) and centrifugal (irrigation). Thus, much of the wealth that will be created in the northern periphery during the early decades of capital will be partially drained to metropolitan area including, of course, the city of Montreal, home to major financial institutions, senior services specializing in engineering, transportation, equipment, architecture, etc..., and headquarters of extractors of natural resources including Hydro-Québec. Despite this polarization of higher functions in the central Quebec region constituting a critical mass of factors to accompany (or irrigate) development in the periphery, more benefits from the economic vitality will be routed to the financial capitals of the world where the driving forces of the Nordic momentum are found, particularly customers, suppliers, research centers and R&D, contractors and financiers.

The periphery of this densified central zone is usually presented as a large reservoir of natural resources, not least by its high rainfall which feeds several watersheds of rivers with very steep gradients. Quebec has 3% of the world's freshwater reserves. According Dorion and Lacasse (2011), the boundaries of the vast northern territory are uncertain⁵. This uncertainty is particularly illustrated by the change of borders based on tides in Ungava Bay, Hudson and James bays and also in the Gulf of St. Lawrence. It is caused by the issues in dispute over the official boundaries and contested with Labrador.

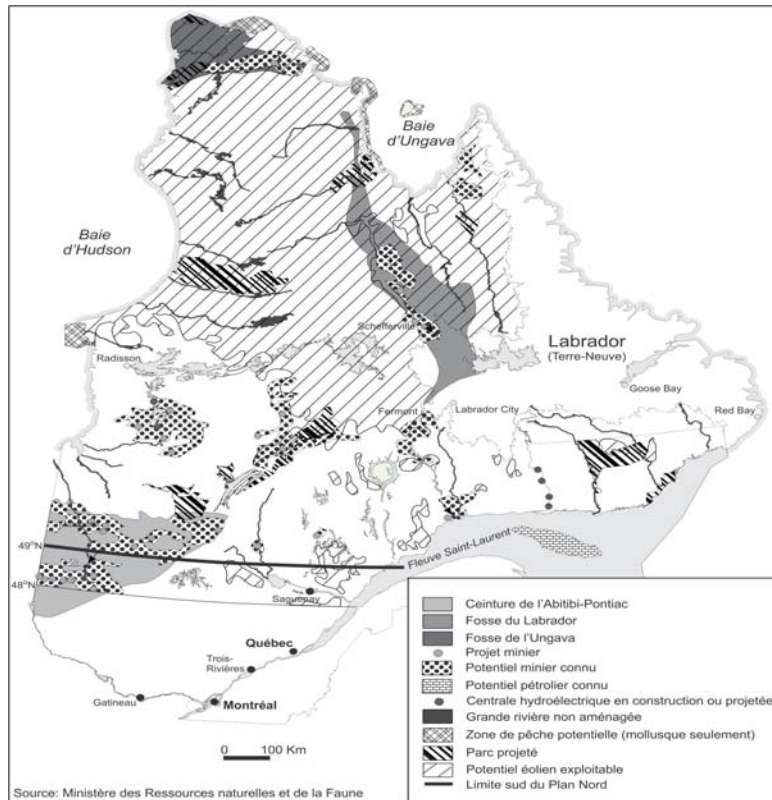
Moreover, according to our reading of the territory, the southern boundaries of the North, arbitrarily set at the 49th parallel by government planners, add confusion to the boundaries of the management area cut into a vast northern periphery that begins much farther south according to geographers⁶. For some analysts, the dual drainage to the north and to the south is a very good traditional territorial demarcation. For statistical reasons and in compliance with the regional divisions of Quebec, this paper's analysis considers four regions that make up northern Quebec: Abitibi-Témiscamingue, Nord-du-Québec, Côte-Nord, and Saguenay-Lac -Saint-Jean.

In this vast northern region, the presence of operated hydraulic reservoirs and others potentially exploitable, as the Great Whale River, the huge water complex of Ungava Bay, and the rivers of the Lower North Shore flowing in the Gulf of St. Lawrence, should be emphasized. The periphery contains a boreal forest which is unique in terms of its excellent fiber quality.

⁵ In this uncertain definition of external borders, also note the presence of many indigenous internal divisions (communities, nations) and allochthonous (regions MRC, municipalities, administrative units) which multiply the territorial references and decision making.

⁶ For many of them, North being divided into and Middle and Far North, begins beyond the Laurentian Mountains which determine the southern limits of the North. For others, the Laurentians are already part of the North.

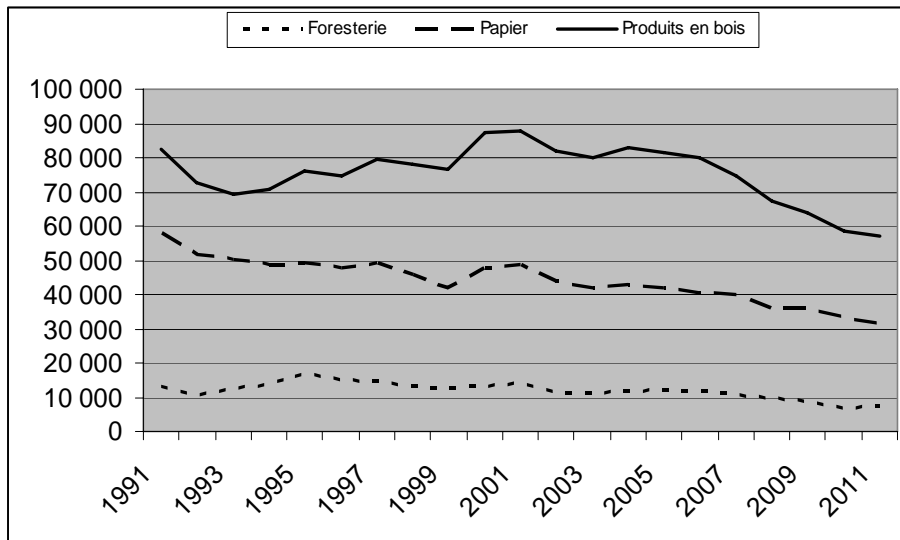
Map 1
Main Northern Reserves of Natural Resources



The peripheries of Quebec contain several impressive wind energy potentials, particularly in the Gulf of St. Lawrence, in the Caniapiscau Reservoir and south of James Bay. There are also several areas of great interest for tourism such as the Georges River, the Torngat Mountains, the Rocher Percé, the Pingualuit Crater, the Saguenay Fjord, the Otish Mountains, and the Mingan Archipelago. Also notable is the Red Bay in the Gulf of St. Lawrence, once the first industrial site of the newly occupied North America, anchored in the whale-hunting industry. Today, the Gulf has considerable oil reserves and a significant potential for mariculture.

Map 1 shows that the periphery of Quebec also contains other large areas filled with mineral resources, particularly the Labrador Trough full of iron and the Cadillac Break which represents the wealth of Abitibi. It also contains significant basins of nickel, phosphate, diamond, uranium, etc... Some of these are already depleted like iron in the Town of Gagnon. Other basins are in intensive exploitation such as the Raglan mine or that of Wabush, while the basins of some places, such as Bloom Lake, will soon be in operation.

Graphic 2
Evolution of Employment in the Forest Industry in Quebec



Source: Statistical Institute of Quebec; RTDC, UQAC.

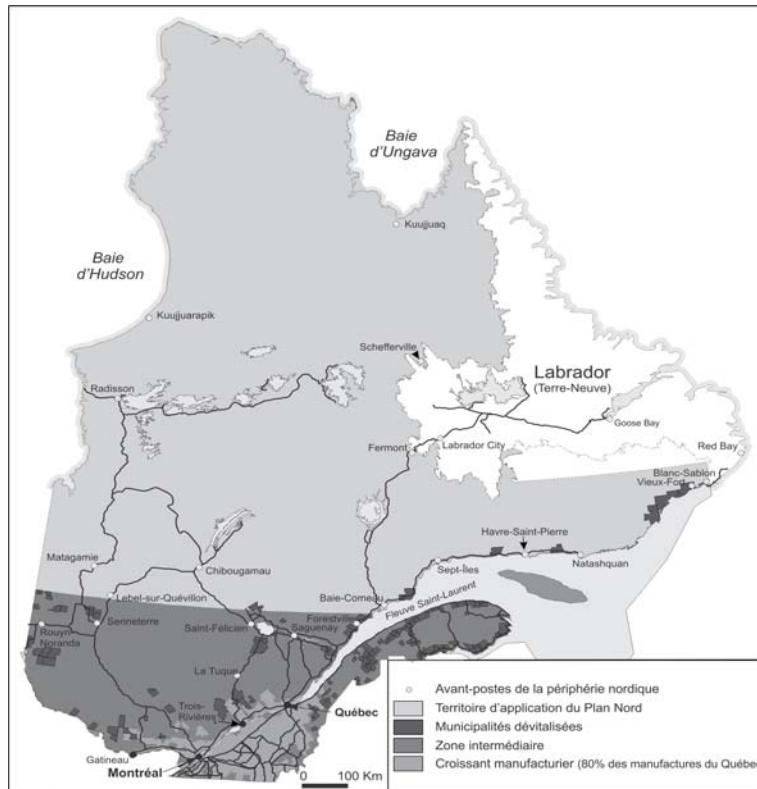
Within this vast periphery north of the Laurentians, boundaries established at the 49th parallel now draw an intermediate area (Map 2). It is positioned between the central polycentric zone of metropolitan nature and the northern territory divided by the plan. This intermediate zone includes limits reached by the Quebec ecumene that has been narrowing in the last decades. It also has most of the vast boreal forest whose economic activities are currently undergoing profound changes related to a new technology push, the breakdown of stocks, and markets in transformation. The graphic illustrates the difficulties of the employment situation in this sector during the last decade, representing decreases of 7,000 forestry jobs (-50%), 10,100 in the paper (-29%), and 13,500 in wood products (35%). We must consider as well in this intermediate peripheral area the important abandonment of insufficiently fertile land⁷ and the decline of maritime activities on the coasts of the St. Lawrence.

In reality, the vast intermediate peripheral territory shows deterioration of its business, its jobs and its population. This deterioration is well-known and is well-illustrated by the development index of Quebec municipalities made available by the Government of Quebec (Quebec, 2006). Of the 185 local authorities that make up the four administrative regions of northern periphery, a minimum⁸ of 72% of them are or are being devitalized. They add to that of Gaspésie where more than 90% of municipalities in this region fall under this trend, in need of development.

⁷ In Quebec, after the opening of 250 new agro forestry parishes in the 1930s, the agricultural area covering 20 million acres (136,000 farms) has steadily narrowed to 8.3 million acres currently or the equivalent of 29,500 farms. Presently remains in 2012 only 10% of people who were active in agriculture in 1940, or about 89,000 people.

⁸ For statistical purposes, this figure does not fully include all the communities in the administrative region of Nord-du-Québec.

Map 2
The Three Geoeconomic Areas of Quebec



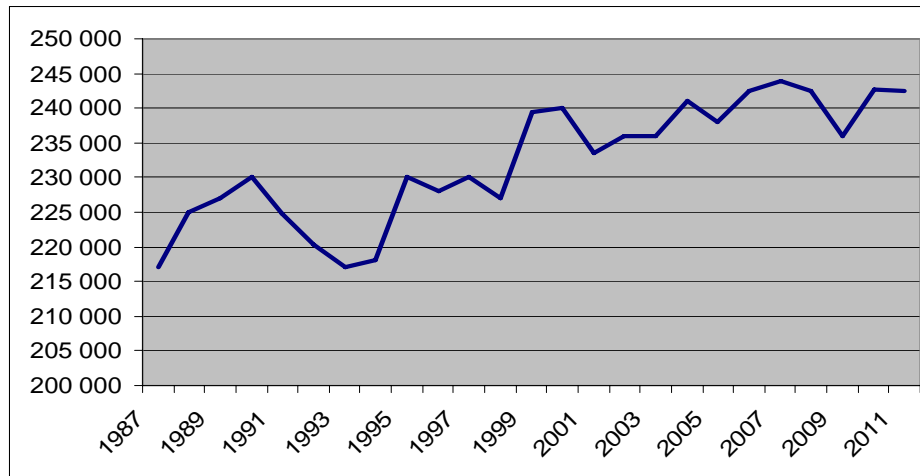
The mapping of this Quebec devitalization index clearly illustrates a specific area, admittedly somewhat unclear in its borders, but nonetheless real from east to west within the province of Quebec (Map 2). Based on the Ontario border to the south, then on the fringe of the metropolis, and finally on the U.S. border to the east, while including the Gaspésie, the devitalized area extends north to the Lower North Shore. It contains the majority of municipalities showing the lowest rate of development mentioned above. Apart from the major cities that polarize the population and activities, only a few small circles stand out positively in this intermediate zone that extends as a wide transition band to the north of the northern peripheries.

Two major geo-economic issues arise in connection with this specific area of devitalization. The first concerns the possibility of collecting the effects of diffusion of growth generated within the territorial metropolitan expansion in central area. Already, some areas well-endowed with tertiary activities such as La Pocatière, Rivière-du-Loup, Baie-Saint-Paul, and Mont-Tremblant seem to benefit from these centrifugal effects while Saguenay, Mont-Laurier and the Shawinigan strongly hope while focusing their transport infrastructure to reduce the effect of distance. Currently, one may wonder how this transitional periphery can capture the positive effects of economic boosts generated in localized areas further north that receive impressive capital, consume goods and services, and deliver raw materials extracted from the various basins and deposits. No doubt that the manufacturing sector represents an explored path. The answers to these two questions which are of great interest to public policies that must support both the central and northern areas in their development, while fighting against devitalization of the intermediate zone.

Employment in the Current Cycle

Within the northern periphery, statistically composed of four administrative regions (Abitibi-Témiscamingue, Nord-du-Québec, Côte-Nord, Saguenay-Lac-Saint-Jean), the number of new jobs created in total is not equivalent to profit of 38% of capital during the observed period.

Graphic 3
Evolution of Total Employment in Northern Periphery

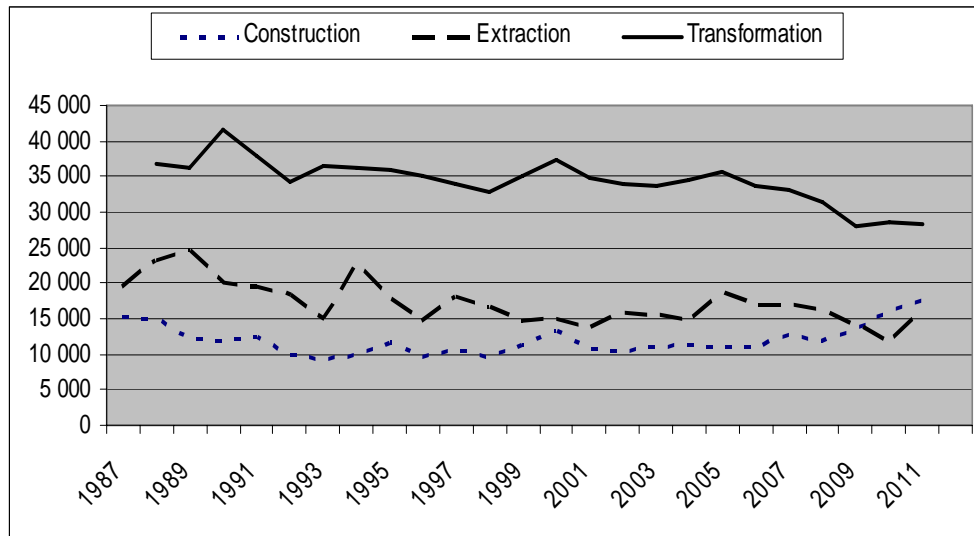


Source: Statistical Institute of Quebec; RTDC, UQAC.

Indeed, for this area, Graphic 3 shows a positive trend of only 1.2% of the volume of jobs for the 2000s. This growth is not only modest, it also is slower than in the previous decade (4.3%) during which assets were rather moderate. In short, we are noticing a slowdown in net job creation despite the considerable acceleration of capital.

According to one reading of the situation by the statistical headings in the four northern regions of Quebec, Graphic 4 allows us to refine our analysis of employment trends. The good news is the creation of 6 700 jobs in construction activities, an increase of 62% during the 2000s. This certainly represents a positive contribution, interesting, but not equivalent to the assets that have doubled in volume. The construction activities will prove considerably stimulated by the Nordic capital, but it appears that, in this periphery, many jobs related to infrastructures, equipment and buildings on site end up elsewhere.

Graphic 4
Employment Trends by Headings in the Northern Periphery



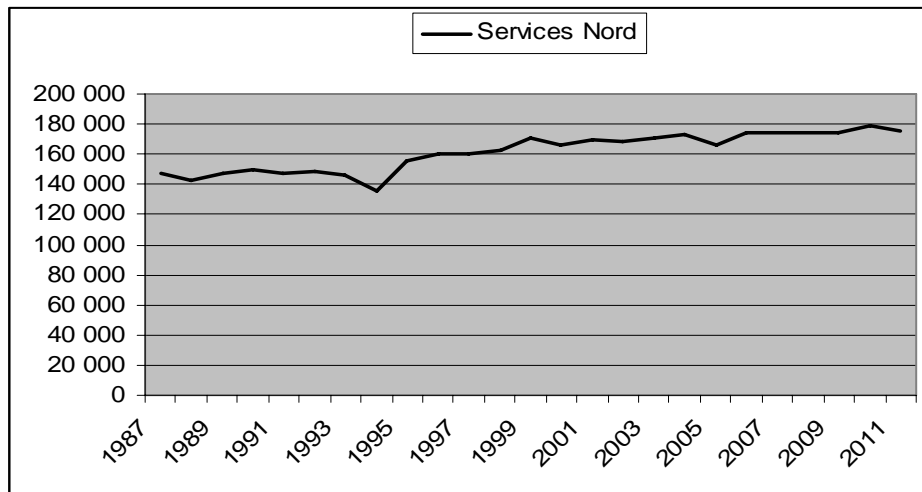
Source: Statistical Institute of Quebec; RTDC, UQAC.

With regard to the jobs generated in the primary sector of resource extraction, the graphic shows a gain of a few thousand jobs in 2006. These jobs were lost thereafter despite significant gains in capital. We can thus assume that the new northern immobilizations, which advance the technological level of extraction in the entire northern area, generate very few jobs for the moment.

Pertaining to the processing of natural resources, the same graphic shows that the number of total jobs has decreased by more than 25% during the 2000s, a net loss of more than 9,000 jobs. This means that within the various fields of natural resources, structuring downstream in the production sectors certainly does not show expansion in the northern periphery.

However, in the service sector, Figure 5 shows a significant gain of 9700 workers in the four regions of the northern peripheries during the period under review. These are business and public services. In terms of the number of jobs generated in total, note that this section gets more impact than that of construction and extraction, even managing to participate in the compensation of jobs lost in the sector of processing of materials extracted during the 2000s. Nevertheless, in this area, adding more jobs to this category of services corresponds to a ratio of 6% and illustrates, in the analysis, that the services located north benefit little, in terms of employment, from recent additions in Nordic Capital.

Graphic 5
Employment Trends in Services in the Northern Periphery



Source: Statistical Institute of Quebec; RTDC, UQAC.

According to the statistics, we find that only 18 700 jobs were created in the sectors of construction and services, while resource extraction activities, the main objective of capital, showed only a minor increase of 1 000 jobs. Of the 20 000 jobs created, subtract the 9 000 jobs lost in the processing sector during the reporting period. These jobs are certainly welcomed and appreciated in this periphery.

Moreover, these relatively modest data are consistent with recent forecasts which were realistically conservative (Quebec, 2010). However, the general observation raises serious concern. It is indicative of a significant structural change in relation to the past situation in economic sectors present in this area. In fact, in the northern periphery, the number of jobs created during the 2000s is not to a level that meets the scope of the development of immobilizations. It is clear that the well-known constraint on the development of the peripheries, namely the significant financial leakage outside economic circuits, becomes more important.

Five Converging Causes

How can this weak performance of Nordic employment be explained despite the driving force in capital requirements during the 2000s? Our analysis raises five reasons that contribute to such low northern benefits.

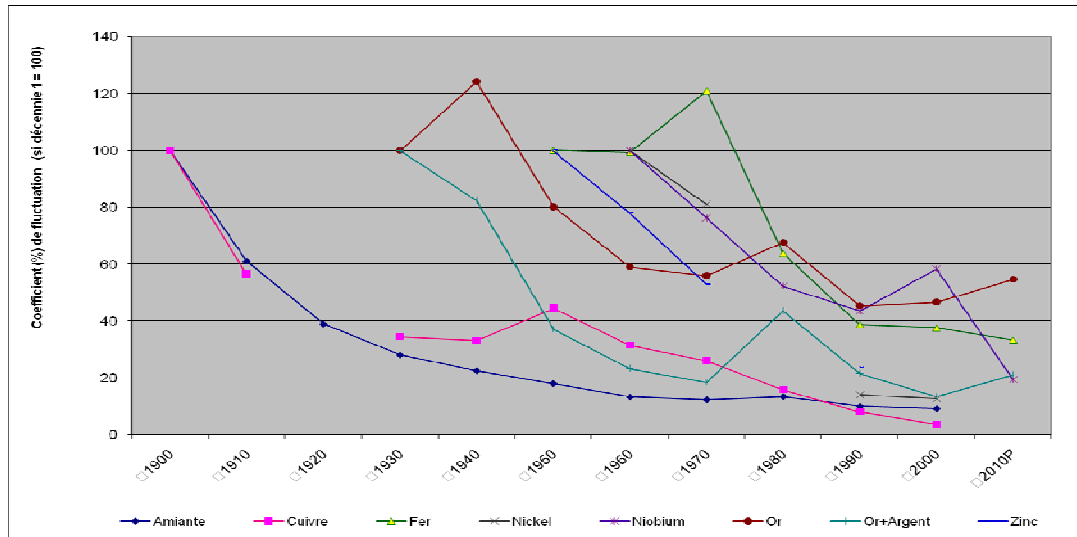
The first cause is linked to the under-performance in certain sectors. According to Graphic 2, the forest industry has lost a minimum of 30 000 jobs in Quebec during the period. As the boreal forest appears largely concentrated in the considered periphery, particularly in the intermediate zone, no doubt that this important sector-specific decline directly affects the overall performance of the categories of processing and extraction. In fact, gross employment in mining and hydropower was statistically neutralized by the jobs lost in the forest industry. Indeed, without the contribution of major capitals in peripheries during this period, the decline of the forest industry and the weak employment performance in metal (aluminum in particular) would obviously have been more dramatic in the four northern regions considered for our observation. In addition, we must grant that certain financial assets observed at the end of the month do not yet convert in the form mining jobs in 2010.

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The second reason is technological. It should be borne in mind that hydropower by new computerized northern infrastructure generates only few permanent jobs at the site of operation. New mining projects use technological equipment which requires much less workstations than before. Compilations from our archives (Graphic 6) has allowed us to observe that, since the previous northern edge of the post-war period from 1939 to 1945, productivity gains were that in 2010, between two and five times less workers were needed to extract the same amount of data mining (Proulx, 2011). For instance, 459 workers were used to extract one million tons of iron in 1950, while this number dropped to 153 in 2010, nearly three times less. For projects already announced for the 2010s, in the most present mining industry in the northern periphery, 51 workers will be used for every million tons of iron extracted. In short, technological intensification in mining, as in forestry, explains the absence of employment gains somewhat counterbalanced by new desired and desirable processing activities.

Also, the necessary technological inputs are generally induced by the implantation of equipment designed and manufactured outside the Nordic points of immobilizations. They are delivered "turnkey " in buildings, infrastructures, and factories usually built on site, but with materials largely imported. Machinery required for construction and extraction activities is generally sent on mining and hydropower locations from the south. In addition, several mining equipment contracts are awarded to firms outside of Quebec generating employment in the United States, Ontario, Australia, India, South Africa, etc... We are witnessing a phenomenon designated by Barnes (1996) of dislocation between host venues of capital and equipment manufacturing sites. In fact, in the various immobilization projects in the northern periphery, the actual injection on the sites operated only represents a small percentage of the amount recorded in the statistics. Even for projects that are located near the northern cities like Chibougamau, Fermont and Havre-Saint-Pierre, buying locally is limited while caring investors try to maximize to meet the economic elites. In short, technological intensification reduces the local ratio of the monetary injection associated with the asset as shown by the statistics.

Graphic 6
Employment Trends by Extracted Mineral Volume



Source: Compilations from mining archives; RTDC, UQAC

It is noted that despite the positive speech and expressed hopes, the transformation of raw materials into processed intermediate products is not forthcoming. Modifying a classic logical location of associated companies in a supply chain is a simple task (Barton and al., 2008). To this end, in Quebec, the northern periphery is currently losing jobs in this category of transformation. It seems that not only transformers of final products, but also their upstream suppliers, prefer to locate close to major markets. In these places fits a set of attractive factors (transportation costs, specialized services, labour, etc...) for now enormous production units.

Finally, the last cause of low-Nordic employment is connected to the new Nordic nomadism. It is explained by the recruitment of mobile workers who migrate intermittently between the Nordic extraction site and their family residences located further south. This phenomenon of commuting is known as "Fly in - Fly out". It now represents the new modality of operations for remote places of extraction of natural resources. Companies in Montreal, Quebec, and the St. Lawrence Valley gladly get contracts that they honour with their mobile workers who migrate to work sites. Already experienced in forestry, hydropower and fishery operations, these mobile workers often cause a bookkeeping entry south for work in the north. In addition, the fact that jobs are recorded north and mobile workers' incomes are being largely spent in the south ensures that the effects in terms of induced jobs register in the south.

As a result of the significant improvement of transportation and communication means, workers now make regular trips between worksites and places of residence generally located further south in Rouyn, Val-d'Or, Sept-Îles, Saguenay, Quebec and Montreal. Apart from the new developments in well-positioned northern cities as Fermont, Chibougamau, Malartic and Sept-Îles, there will be no new permanent settlements with the current new Nordic cycle, except possibly a central hub located near the huge Lake Otehluk iron ore deposit, located between Brisbay near the Caniapiscau reservoir, Kuujuaq and the Ungava Bay. In short, there will be no or little local economy around the natural resource extraction sites.

Nordic Development Poles

Yet, the major geo-economic phenomenon that marks the settlement structure in Quebec periphery appears concerned by the presence of outposts established as breakpoints. These places are suitable for transshipment of goods between modes of transportation such as the mouths of rivers, deep bays of the St. Lawrence River, or well-positioned historic settlements. Outposts act as stepping stones to enter the territory. When there is convergence of multiple modes of transportation, they become true hubs or small Nordic "hubs". The main specimens of these outposts in Québec's northern peripheries are actually Sept-Îles, Baie-Comeau, Saguenay, Chibougamau, Rouyn, Val-d'Or, Amos, Havre-Saint-Pierre and Kuujuaq.

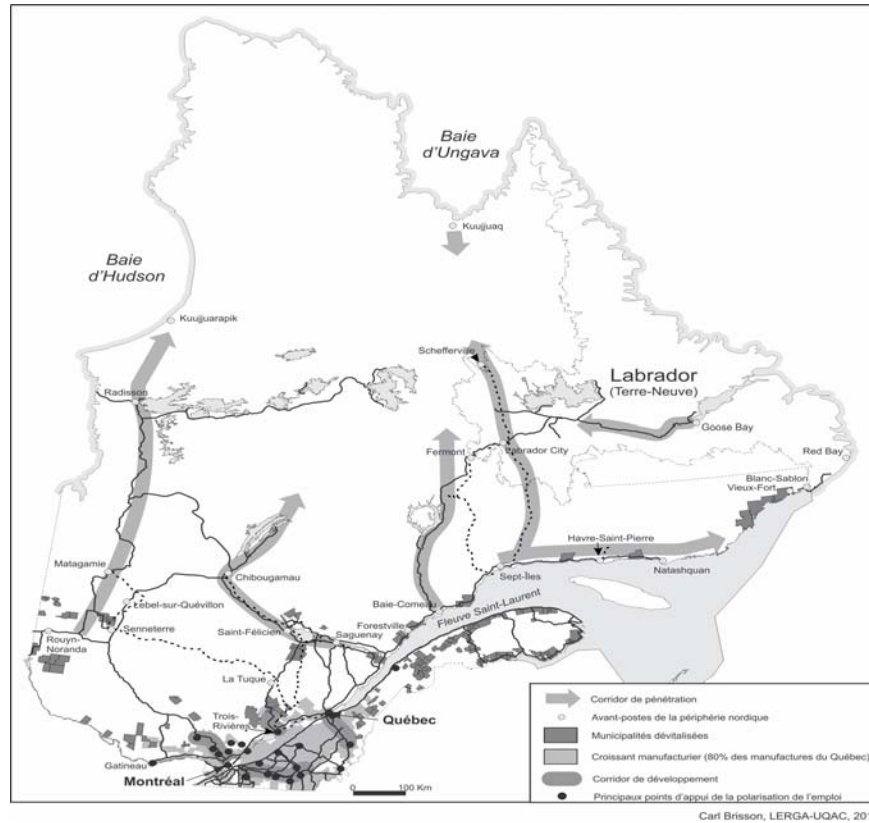
"Territorial access corridors" stem from these outposts (Map 3). It is a well-known, classical geo-economic phenomenon to, on one hand, access and collect inputs in the vast periphery and, on the other, to provide goods and services. Currently in Québec, these territorial linear forms correspond to six specific areas, namely

- Rouyn - Amos - Matagami - Radisson;
- Saguenay - Saint-Félicien - Chibougamau - Nemiscau;
- Baie-Comeau - Manic - Fermont
- Sept-Îles - Havre-Saint-Pierre - Natashquan;
- Sept-Îles - Schefferville
- Port-Cartier - Fermont ,

Distinct in their reciprocal form, these corridors share a common peripheral nature and similar contents.

For outposts, the role of territorial access is due to the presence of different activities related to trade, transit and transshipment of goods, but also territorial coverage of superior services in engineering, health, finance, architecture, land surveying, accounting and other motor specialities of territorial development. These Nordic poles also host resources processing plants, wholesale and retail businesses, higher education institutions, applied research centers, public and private administrations, etc... The territorial occupation is made from these outposts where activities, expertise, workers and the population in Québec periphery are concentrated. Also, by their centrifugal forces, these poles expand the economic, social, cultural, ecological and political development, including several neighboring devitalized communities.

Map 3
Northern Periphery Access Corridors



These poles, secondary compared to Montreal, Quebec and Gatineau, together form a northern arch which stands as an original territorial form whose overall geo-economic specificity concerns more the common Nordic vocation of its main urban components rather than their existing economic interactions, but still systematically underdeveloped. These relationships and horizontal exchanges between the outposts of the arc still need to further intensify, in a spirit of interdependence addressing the main issue of reciprocal collective empowerment of their common Nordic destiny. To this end, no doubt that the "Northern belt" concept is relevant to operationalize in consultation, according to a common vision of nordicity, where complementarity spirit in terms of objectives, equipment, infrastructures, and expertise needed for this vast periphery. Several collective issues are clear, including cohabitation with Aboriginal peoples, environmental protection, technological innovation, resource processing, the new Nordic niches, quality of life, etc...

Conclusion

Québec's northern periphery is currently evolving in a transitional phase driven by a new economic cycle characterized by its structural effects on the environment, technology, employment and habitat. No doubt that Quebec's GDP obtains substantial benefits to the marked increase of 38% of northern capital during the 2000s. With a gain of only 1.2% over the reporting period, employment growth is however not successful in this northern area.

A new peripheral model emerges. It is very different from the model of the 1939-1945 post-war that allowed the emergence of several towns and villages in the intermediate and remote periphery. Here, as elsewhere in the peripheries, the equilibrium conditions which once generated a territorial development on natural resource extraction sites, prove modified by intense technology operations requiring no longer sustainable anchoring (Coe & Hass, 2011; Mackinnon, 2013). With the current structural cycle in Quebec northern periphery, there will be no new settlements such as Chibougamau, Fermont, Labrador City and Schefferville, if not a settlement in Otelnuk Lake. Comfortable northern camps will accommodate migrant workers. They will come from southern Quebec, from the outposts of the intermediate periphery that will be well-positioned to face challenges in infrastructures, equipment and specialized services. Also well-positioned places as Chibougamau, Fermont, Havre-Saint-Pierre, Issipit, and Matagami will reap benefits.

For local peripheral communities already in difficulty according to the development of Québec municipalities of the Quebec Government, few will be positively affected by the new northern front. Unless specific and very strong public measures, the devitalization inexorably will continue for the majority of them. However, some well-positioned communities will benefit from the extraction of natural resources including northern exoticism. Already Inuit villages like Salluit and Kangiqsujuaq provide 16% of the 600 workers at the Raglan mine. Chibougamau and Fermont also become interesting cases because of their central positions. Note that at Malartic, the new gold mine is located within the city, so that the correct positioning also becomes a problem of too close proximity.

Considering these well-illustrated modalities in relation to the current Nordic cycle which has its equivalent elsewhere in peripheries (Sheppard, 2013), we find that the external drainage of the wealth created in the North is increasing significantly in Quebec. To change this increased imbalance in the current peripheral transition by restraining development, two non-competing solutions and even further to offer collective thinking about the North.

Under the excellent natural endowments of the area (Map 2), it is first possible to consider the new attraction really major exogenous impulses. Oil in the Gulf of St. Lawrence, the very large basins of iron in the Labrador Trough, and huge wind resource of Caniapiscau could attract megaprojects. To this end, the exploitation of these resource reserves could result in each capital of several billion dollars, or \$ 12 to \$ 15 billion in the case of localized Lake Otelnuk iron for a real project which turns current study feasibility. As in the other possible cases, the jobs created by the production of such a resource extraction megaproject would certainly numerous. They require a settlement much larger than a mining camp or addition of subdivisions to a place already prepared. Consequently, local economic activities would thrive once more in the northern peripheries as it did formerly in Fermont, Chibougamau and Matagami.

The other option then is the government support for an empowerment dynamic of innovative levers for endogenous development. The objective would be to retain in the North more of the wealth created in the periphery by the various natural resource extraction activities. During the construction phase of the equipment and thereafter the extraction and transportation of the resource, Quebec could

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set a mandatory % of the procurement of human resources activities, materials, supplies and services directly on site. No doubt, for this purpose, the operative concept of "Northern belt" could be useful to target the peripheral area in question from which the flight of created wealth is increasing. Retention tools could be implemented, in particular to attract workers and their families. It should be also stressed that a portfolio company affected by the economic diversification could be created by an alliance of interior outposts and this Northern belt, by using a portion of the fees paid by the extractors of resources. Partnerships and even take-over should be considered to take advantage of economic opportunities in the Northern Periphery.

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