A Macro-level Approach to Examining Canada's Primary Industry Towns in a Knowledge Economy

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Abstract

Using a macro-level approach, this paper aims to examine the economic well-being of single industry communities and to ascertain if they are adequately preparing to compete in today's knowledge economy. Large samples of census subdivisions (CSDs) were used to compare single industry municipalities with diversified ones across Canada from 1986 to 2001. In addition, towns that maintained a high percentage of employment in primary industry were compared to ones that diversified their employment base.

It was found that diverse municipalities endured a greater era of development and are better positioned for success in the future. Unexpected were results from 1986 to 1996 when diversifying single industry towns did not incur substantial gains compared to concentrating single industry communities. From 1996 to 2001 though, it became advantageous for communities to strive towards a diverse economic base. A contributing factor to this phenomenon is the fact that knowledge jobs played a minimal role in diversifying communities from 1991 to 1996. However, from 1996 to 2001 diversifying primary industry towns substantially increased the percentage of jobs related to the knowledge economy. Correlating to this shift in employment structure were positive changes to the socio-economic make-up of these towns. Additionally the size and geography of single industry towns are revealed as significant factors for the viability of single industry towns.

L'utilisation d'un macro-niveau approche le but de ce papier explore le bien-être économique de communautés d'industrie seules de même que vérifie s'ils préparent suffisamment à concourir dans l'économie de connaissance d'aujourd'hui. De grands échantillons de subdivisions recensées (CSDs) ont été utilisés, pour comparer les communautés de l'industrie primaire avec des municipalités à économie diversifiée à travers le Canada, de 1986 à 2001. De plus, les villes ayant maintenu un pourcentage d'emploi élevé dans l'industrie primaire ont été

comparées aux municipalités qui ont diversifié leur emploi pendant la même période.

Il a été démontré que les municipalités présentant une économie diversifiée vivent un développement durable et sont mieux positionnées pour le succès dans le futur. L'imprévu était le résultat de 1986 à 1996, lorsque les villes ayant diversifié leur industrie primaire n'ont pas obtenu de gains substantiels, en comparaison aux municipalités qui ont concentré leur économie dans le secteur primaire. Cependant, de 1996 à 2001, il devint avantageux pour les communautés de se diriger vers une économie diversifiée. Un des facteur contribuant à ce phénomène est le fait que les emplois hautement spécialisés jouaient un rôle mineur dans les communautés à économie diversifiée de 1986 à 1996. Toutefois, de 1996 à 2001, les villes à économie primaire s'étant tournées vers une économie diversifiée ont augmenté, de manière substantielle, le pourcentage d'emploi relié à l'économie du savoir. Corrélé à ce changement dans la structure de l'emploi, ces villes ont aussi présenté une évolution socioéconomique positive.

1.0 Introduction

Primary industry has played a pivotal role in the history of Canada. With mining, forestry, and fishing being key generators of wealth, Innis (1956) as well as Hayter and Barnes (2001) go as far to say that resources have defined Canada's role in the world economy. As a result, a great deal of literature (Innis 1956; Lucas 1971; Bradbury and St. Martin 1983; Hayter and Barnes 1990; Clemenson 1992; Barnes and Hayter 1992, 1994; Becley 1994; Norcliffe 1994; Halseth 1999, 2002; Halseth and Hanlon 2005) has been devoted to examining communities whose employment is dependent on this type of activity. Known as single industry towns (SITs), Canadian municipalities that fall into this category have been subject to a wide array of experiences.

Previous studies have proved valuable in our understanding of single industry communities across Canada. Research completed on the stages of development (Robinson 1962; McCann 1978), restructuring (Hayter 2000; Halseth 2005), and global competition for resources (Bradbury 1979; Markey, et al. 2005) highlight only three of numerous issues where work has increased our insight into single industry communities. However, it is important to note that the amount of research has diminished over the last decade. As Barnes (2005) suggests, resource economies have not been of particular interest to contemporary geographers. Also of significance is the profound reliance on case studies. While they are invaluable, Goldstone and Janssen (2005) put it best when they question the reliability of generalizing case studies over a broader spectrum.

This paper sets out to tackle limitations of existing research on single industry towns in Canada. Utilizing socioe-conomic data from 1986 to 2001, we attempt to examine these communities in today's international business climate. If the very nature of their existence is the acquisition of inputs for manufacturing, how will these communities fare in a knowledge economy? Following Randall and Ironside (1996), a macro-level approach is adopted to examine a number of key issues. Most important, the viability of single industry communities is assessed by comparing those that maintained a high percentage of primary industry employment to those that diversified their employment base. Additionally the size, type, and geography of single industry towns are explored.

2.0 Single Industry Communities and Diversification

There is extensive literature on single industry communities and with it a wide variety of definitions. The government of Canada (Canada, Department of Regional Economic Expansion 1979) defines a single industry community as one where a single economic activity dominates the livelihood of its citizens. Some single industry towns are dependent on tourism, government administration, as well as defence. For the most part though, economies of single industry communities owe their existence to primary industry employment. Statistics Canada, the Economic Classification Policy Committee (ECPC) of the United States, and Mexico's Instituto Nacional de Estadística, Geografía e Informática (INEGI) utilize the North American Industry Classification System (NAICS) to define primary industry employment as those occupations associated with the extraction and sale of a natural resource. This universal classification system provides for indirect employment associated with primary industry to be included for statistical purposes. Mining, forestry, fishing, and agriculture, including secondary employment associated with these industries, match this definition. While considered primary industry, this paper follows previous research on Canadian single industry towns (Randall and Ironside 1996; Hayter 2000; Clemenson 1992) to omit agriculture because this sector is not as vulnerable to the extreme booms and busts encountered in mining, forestry, and fishing communities. In addition, their unique nature requires policies unrelated to other primary industries to handle their problems.

The economy of single industry communities is one of dependency. They do not enjoy the security possessed by diversified towns because they are always vulnerable to fluctuations of their resource. In a global economy with increasing free trade, this vulnerability increases (Markey et al. 2005; Pretty 2003; Norberg-Hodge 2003). Today resources can be more easily obtained or replaced with a substitute. Consequently, globalization of economic activity enhances the problem of uncertainty and community longevity (Robinson 1962; Canada, Employment and Immigration Advisory Council 1987; Mulkey and Murphy 2002).

During the 1980s, a great deal of research explored the question of diversifying the economic base of single industry towns to suppress the uncertainty of relying on one resource (Norcliffe 1983; Locke 1986; Robson 1986; Decter 1993). Diversification here means to distribute employment among different industries to reduce risk in the event of the demise of a particular industry. Overwhelmingly, researchers suggested that the best way to prevent the downfall of communities dependent on primary industry was not to wait for problems to arise. By continued monitoring, a proactive stance towards diversification could be taken. With adequate planning, this would decrease the severity of busts and increase the long-term viability of the community. This transformation might end in new jobs that require different skills and pay less than the lost jobs, but at least there is employment and a foundation for a community.

Clemenson (1992) used the Herfindahl Index to explore the issue of diversification of fishing, mining, and wood-based industry towns in Canada. The Herfindahl Index measures industrial concentration or economic specialization in a community. This 'specialization' index shows the level of industrial concentration for each community. She found that mining and wood-based communities displayed slightly greater diversification tendencies than did fishing villages. Nevertheless, determining if these towns diversify is to answer only part of the

question. One component of this study builds on Clemenson's work by taking it a step further to determine if it is beneficial for single industry communities to diversify. Do the socio-economic conditions improve for those communities diversifying their economic base?

2.1 The knowledge economy

The past several decades have witnessed the Canadian economy transform from one dominated by the primary sector to one dominated by the tertiary and quaternary sectors. Knowledge and intellectual capital, previously regarded as exogenous, are now being recognized as increasingly important to productivity, and therefore- long-term competitiveness. The most recent transition has been aptly coined the knowledge economy, in which the role of knowledge as an input to economic processes has increased. While no coherent definition of the knowledge economy exists, the Organization for Economic Cooperation and Development (OECD 1996) has tried to define it in general terms as an economy that is based on the production, distribution, and use of knowledge. Since the knowledge economy has important ramifications for the future of most single industry towns it is given special consideration in this paper.

For the most part, this increasing shift towards knowledge as an input has had a dramatic impact on the geographical distribution of the population and economy of Canada. Academics (Feldman 1994; Audretsch and Feldman 1996; Malmberg 1997) argue that the role of geography is important in this new economy because of the transfer of knowledge. The geographical part of this argument is based on the assumption that the marginal cost of transferring knowledge increases with distance (Boddy 1999; Glaeser et al. 1992; Simmie 2002). Therefore, it makes sense that select areas or towns take advantage of the knowledge-based economy more than others do.

Recent research on cities from a global perspective argues that only the largest cities can sustain a threshold large enough for continual innovation and learning (Hall 1996; Sassen 2000; Simmie 2002). Consequently, the most significant benefits can only be realized in a select number of urban centers because they are the only ones large enough to posses the necessary preconditions for knowledge accumulation. Of course, single industry communities do not have the necessary conditions to meet this threshold.

Henry and Pollard (2000) go so far as to argue that exploiting knowledge is essential to the survival of cities and regions. In today's competitive business world where companies compete internationally, knowledge is necessary to create superior or cheaper products; otherwise, customers will obtain their products from elsewhere. As argued by Gertler (2001) this business environment accentuates the relevance of knowledge and innovative activities at the local level. The production of knowledge becomes an important component in determining which companies (and the towns where they are located) succeed and which do not.

This new economic environment, one of increased international competitiveness, is a product of time-space compression (Harvey, 1990). Pivotal to this are knowledge and information technologies, which through improved transport and communications have played an important role in progressing globalization. This coupled with capitalist developments and vigorous neo-liberal policies since the

1970s has caused significant changes to employment, poverty, and wages in certain regions.

To take this a step further, knowledge employment is significant because workers in less developed nations typically earn their living from the primary sector and not from knowledge-based employment. Of course, knowledge jobs are moving offshore as well (Andreotti 2004), but not to the extent of primary and secondary sector employment (Carnevale and Desrochers 2002). As a result, Canadians employed in primary and secondary industries are to a certain extent competing for employment against inexpensive labour in less developed nations. This competition suppresses the income of citizens in richer economies like Canada (Reich 2000, 1991; Friedman 2005; Blakely and Bradshaw 2002). Alternatively, an area where an important resource is available in select areas globally competes less with developing nations. Fort McMurry is an example of a single industry community that is built around a highly desired resource, oil, and is therefore thriving. A second situation (and the one this paper sets out to examine) in which citizens have more control over their well-being occurs when a town makes the transition to include a more diversified employment base.

Florida (2005) concurs that the emergence of a new kind of capitalism is based upon the citizens of a region and the knowledge they possess. He suggests that the fortunes of a region are increasingly tied to the capacity to attract and retain knowledge-creating citizens. These people are an integral part of learning region, which Florida (1995) suggests function as collectors and repositories of knowledge and ideas.

This new economic structure presents a daunting predicament for single industry towns. The very nature of their existence is due to the extraction of inputs for the manufacturing sector or the beginning of the production cycle. To be clear, knowledge and knowledge jobs play a pivotal role in primary industry. However, many of the knowledge workers associated with the primary industry are employed in head office locations or research and development labs in distant cities.

A large number of studies have commented on the dependent nature of elements of primary industry towns. This is connected to age-old debates about the 'branch-plant syndrome', which is extended to the extraction-only nature of local operations. The lack of alternative employment opportunities provides a limited long-term functional and occupational base. Today, the lack of knowledge employment impacts the long-term competitiveness of the town.

Pred's (1977) principle of circular cumulative causation argues that a community possessing knowledge in a certain industry is likely to grow because it possesses the necessary condition for growth. Firms want to have access to the knowledge that exists in this city. This brings in more actors, and thus more knowledge. When new people come to the region, they bring with them new ideas. The converging of the different knowledges dovetails into inventions and innovations through new and improved products. Multiplier effects promote the fulfillment of successive industrial thresholds. Today this is occurring in cities where superior knowledge is transferred from one firm to another. Firms in these communities continually maintain up-to-date knowledge that provides a competitive advantage to make superior products sooner.

Unfortunately, primary industry towns have less to do with the production of knowledge, and more to do with the extraction of resources. As suggested earlier,

when the resource is exhausted or a cheaper alternative is found, the competitive advantage of the town is lost. In addition, only a few of the largest cities can sustain a threshold large enough for continual innovation and learning. Baldacchino (2006, 91) argues "any location that is unable to muster a significant knowledge critical mass will find itself exporting people, brains, investment, and other forms of capital to attractive metropolitan zones and their immediate suburbs". The purpose of this paper is to determine if indeed single industry towns are retaining their populations and intellectual capital.

3.0 Data and Limitations

As explained in the introduction, the purpose of this paper is to answer a number of questions dealing with size, type, relative location, and diversity (or lack of diversity) of single industry communities. To accomplish this, education, employment, and demographic data were collected from Statistics Canada's censuses for 2001, 1996, 1991, and 1986 at the CSD level. This information was then applied to a number of samples regarding single industry towns. Because of space constraints, results for 1986 and 2001 are usually displayed and results for 1991 and 1996 excluded. Results that are not displayed in this paper concur with those presented unless otherwise noted.

With no collectively accepted definition of a single industry community, creating a list to conduct macro-level research can be problematic. As suggested earlier, the government of Canada defines a single industry community as one dependent upon a single resource. But how is dependency measured? As an example of the difficulties associated with defining a single industry town, Lucas' (1971, 17) 'Minetown, Milltown, Railtown', a much heralded publication on single industry towns in Canada, describes how his data were collected.

> The list was accumulated through a variety of procedures. The easiest, but not the most practical was to visit the community. The second was long, complicated and not very scientific: it consisted of consulting directories, lists, government brochures, articles, pamphlets and the like to assess available information.

Williamson and Annamraju (1996) suggest that a town is dependent upon forestry when more than 50% of its employment income is based on forestry-related production. Similarly, Samson (1998) identified single industry towns as those where 50% of the economic base is derived from a single sector. In many cases, individual researchers use a percentage of the labour force involved in primary industries as a base for determining what a single industry community is. In some instances, this percentage can range from 20% to 35% of the total labour force (Canada, Employment and Immigration Advisory Council 1987; Clemenson 1992). In other cases, the sample is then altered to carry out what the researcher is attempting to accomplish. Theoretically, the rationalization for these lists is related to the demise associated with a company leaving or a resource being no longer competitive. With so much subjectivity, Randall and Ironside (1996) recommend that a study on Canadian single industry towns must be broadly based with limitations of the findings being identified as a function of the defined criteria.

To avoid debate, this study utilizes a sample constructed by the Canadian Association of Single Industry Towns (CASIT) constructed in 1987 (Canada, Employment and Immigration Advisory Council 1988). The association, headed

by Canadian experts in the field, initially approached Provincial and Federal Governments to supply a list of towns they believed were single industry. This information was combined with reports and research, which already identified single industry communities. It has since been disbanded but at the time it classified 1,461 one-industry resource communities. As pointed out previously, creators of the dataset theoretically argue for the inclusion of towns when they were dependent on a single resource.

We are primarily interested in forestry, fishing, and mining. As suggested earlier, this study follows Randall and Ironside 1996; Hayter 2000; and Clemenson 1992 to exclude those communities dependent on agriculture for two main reasons. First, agricultural towns are not as susceptible to the booms and busts of other primary industries. Second, CASIT omits agricultural communities because their unique nature requires unique policies to handle their problems when compared to other primary industry communities. The result is a sample of 1,198 single industry communities.

This paper also attempts to compare those single industry towns that have diversified over time with those single industry towns that have remained dependent on one resource. To accomplish this, the 1,198 single industry communities were tracked over a 15-year study period. Those communities that maintained or increased the percentage of employment in the primary sector are considered concentrating single industry towns. On the other hand, those municipalities where a decreasing percentage of employment is involved in the primary sector are considered diversifying single industry towns.

Three further objectives of this paper are to determine how size, type, and relative location of primary industry towns influence their viability. With respect to type, single industry towns are separated into three industrial categories: forestry, fishing, and mining. This allows us to determine which form of resource community is adapting to change and which form is not. This sample includes 793 forestry, 281 fishing, and 124 mining communities.

Second, following the notion of Zipf's (1949) rank-size rule, it is accepted that large cities possess superior infrastructure to deal with larger populations. Thus, it is hypothesized that larger communities should be better equipped to deal with booms and busts of the resource industry. For the purposes of this paper, towns are categorized into three sizes. Small single industry towns are defined as possessing less than 1,000 people, medium single industry towns maintain a population between 1,000 and 10,000, and large single industry towns have a population greater than 10,000. The rationale for these groups is based on Statistics Canada definitions as well as sample sizing. A population of 10,000 was adopted as large because Statistics Canada signifies this threshold as a Census Agglomeration. Statistics Canada generally uses a threshold of 2,500 for small or rural populations. Unfortunately, this boundary creates imbalanced sample sizes. To somewhat correct for this, a boundary of 1,000 provided a workable distribution. The result is 682 small, 465 medium, and 51 large communities.

Finally, this paper sets out to determine the influence that relative location has on the viability of single industry towns. We hypothesize that communities in close proximity to urban centres are sheltered from the booms and busts associated with relying on one resource. This argument is based on the fact that when a downturn occurs, workers are able to commute to supplementary employment opportunities.

Statistics Canada has defined the term metropolitan influenced zones (MIZs) to measure such phenomena.

We also hypothesize that the relative location of communities in Southern Canada provides a superior long-term outlook. Citizens of isolated settlements in northern locations have few prospects other than to move. It is helpful to examine North/South questions in terms of a number of different geographic regions. Hamelin (1979) introduced the term Nordicity and later Bone (1992) built upon this definition to generate Canada's north-to-south axis in terms of five zones: Ecumene, Near North, Middle North, Far North, and Extreme North (Figure 1). Canada's ecumene is defined as Southern Canada where the vast majority of Canada's population lives. This region includes Southwestern British Columbia, the southern component of the three prairie provinces, the Windsor to Québec City axis, and the Maritime provinces with the exception of Newfoundland. From the Ecumene, Near North, Middle North, Far North, and Extreme North regions follow in a south to north direction.

Using CSDs to examine single industry communities temporally presents a number of interesting problems. Most notably is the change in geography of a number of CSDs[1]. When comparing raw numbers a change in geography can have a significant impact. When this occurred, proper changes were considered. For example, in some instances data for two CSDs were combined into one.

An additional problem is associated using macro-level data. Unfortunately, a trade-off must occur to examine 1,198 single industry towns country-wide compared to individual case studies. Most importantly, a limitation of the data is interpreting percentage of a community's workforce. For example, the proportional reduction in a community's labour force in one industry can be the result of many factors. For example, it may imply that new industry has come into a community and that other existing industries have expanded. This paper argues that addition of these jobs is a positive change for the long-term security of the community. Perhaps a greater concern is the fact that it may also mean that service departments of the local mill have cut back their in-house employment and now contract it out to a private company. To influence the data, these services would need to be obtained locally. To be sure, this has occurred in many cases. But in a large number of instances, these services are contracted outside of the local town. A limitation of this study lies in the fact that a diversifying workforce could also mean that the major industry has reduced its actual labour force while other industries remain unchanged. This is not necessarily beneficial for the community but is difficult to address in macro-level research. What is also important is the addition of knowledge jobs, which make up an increasingly important component of the new economy (Foray and Lundvall, 1996).

[1] CSD is a general term applying to municipalities as determined by provincial legislation. Over time, some provincial governments have decided to alter the physical dimensions of CSDs, for example, when a government decides to amalgamate a number of communities into one community to realize savings on economic and social welfare. The negative effect of this decision to researchers is to change the physical make-up of the one community. This then influences raw data and makes it difficult to compare temporally. This problem is particularly applicable to the province of Québec and Ontario.

4.0 Results

From a geographer's perspective, results associated with the spatiality of single industry towns are the most intriguing. These results are revealed in Figures 1 and 2, which show different perspectives on the location of these communities and how this influences their viability. Specifically, we examine the core-periphery model as it applies to single industry towns in Northern and Southern Canada (Figure 1) as well as the spatial relationship of single industry towns with metropolitan areas (Figures 2a and 2b).

Myrdal (1957) and Friedmann (1966) developed the traditional core-periphery model to explain how regions develop differently over time and space. The core-periphery model, applied both nationally and internationally, is rooted in a hierarchical geographical structure with inequality the end result. The main argument of this theory is that some regions enjoy considerable potential for prosperity while others do not. It is a two-region model that differentiates between areas that control output (the core) and the hinterland that supplies resources (periphery). The outlying resource base may be rich, but generally, it is exploited, with benefits flowing to the distant core. The model argues that the periphery's remote location and small population limit its ability to diversify and develop economically. Additionally, companies in the core govern the economy of the resource hinterland and control the rate of development.

In terms of Canada, the core-periphery concept epitomizes the North-South relationship. Researchers (Wallace 1998; Daigle 1988) argue that limited economic diversification hinders long-term viability of northern development. With the vast majority of basic sector jobs in many communities relying on one industry or one company, occupational diversity is constrained. This drawback is further amplified by the managerial hierarchy of the branch plant theory, which reveals that few high-level management positions (important knowledge jobs) exist in Northern Canada. In the past, this has meant that critical decisions for companies in the North have been made by management in Toronto, Montréal, and Vancouver.

More troubling for the North is the present. As suggested by Drache and Gertler (1991), in their attempt to be internationally competitive, companies continually adopt technologies that increase productivity. This has reinforced management's power to maximize profit at any expense. To accomplish this, it is often easiest for management in Southern Canada to exploit northern workers for two reasons. First, northern workers possess little leverage. If a company leaves, it is difficult for workers to find alternative employment. Second, managers retain little attachment to Canada's North while living in Canada's South.

More problematic to long-term stability in the North is that with increasing liberalization of trade, the region is less insulated from international competition. Northern Canadian development now competes more than ever before with areas all over the world with similar resources. In many cases, foreigners now control a great percentage of ownership of the companies in Northern Canada. While management in Southern Canada holds little attachment to the long-term welfare of Northern Canadian communities, foreign managers most likely hold less.

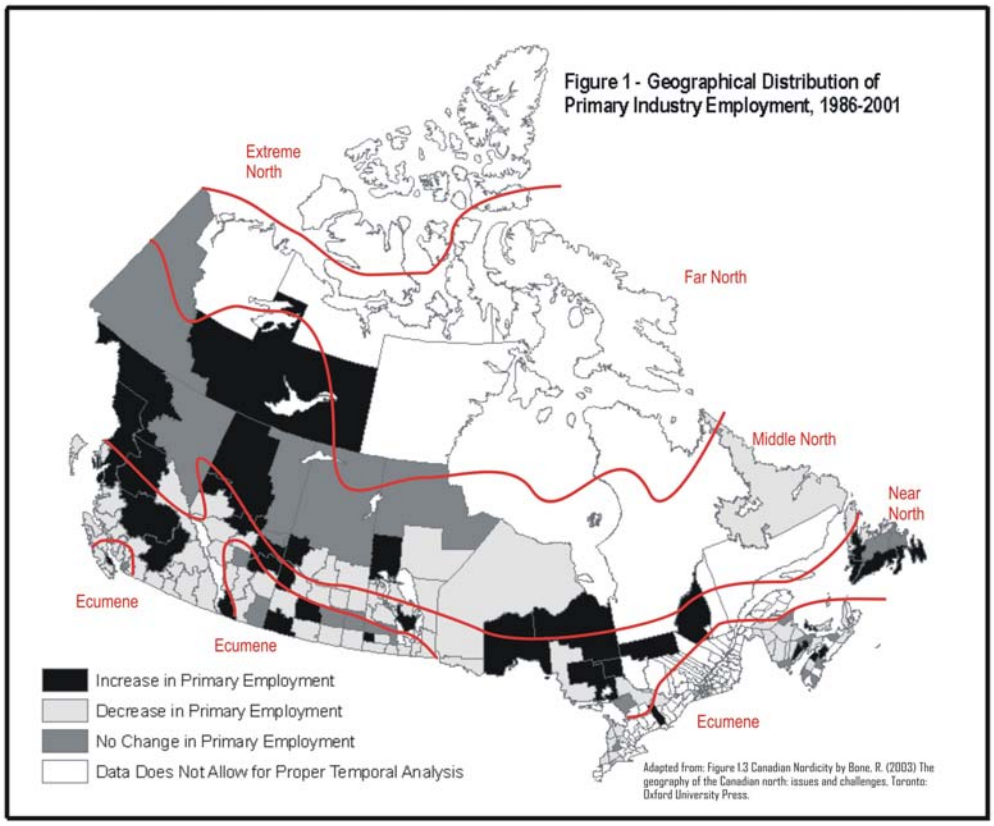
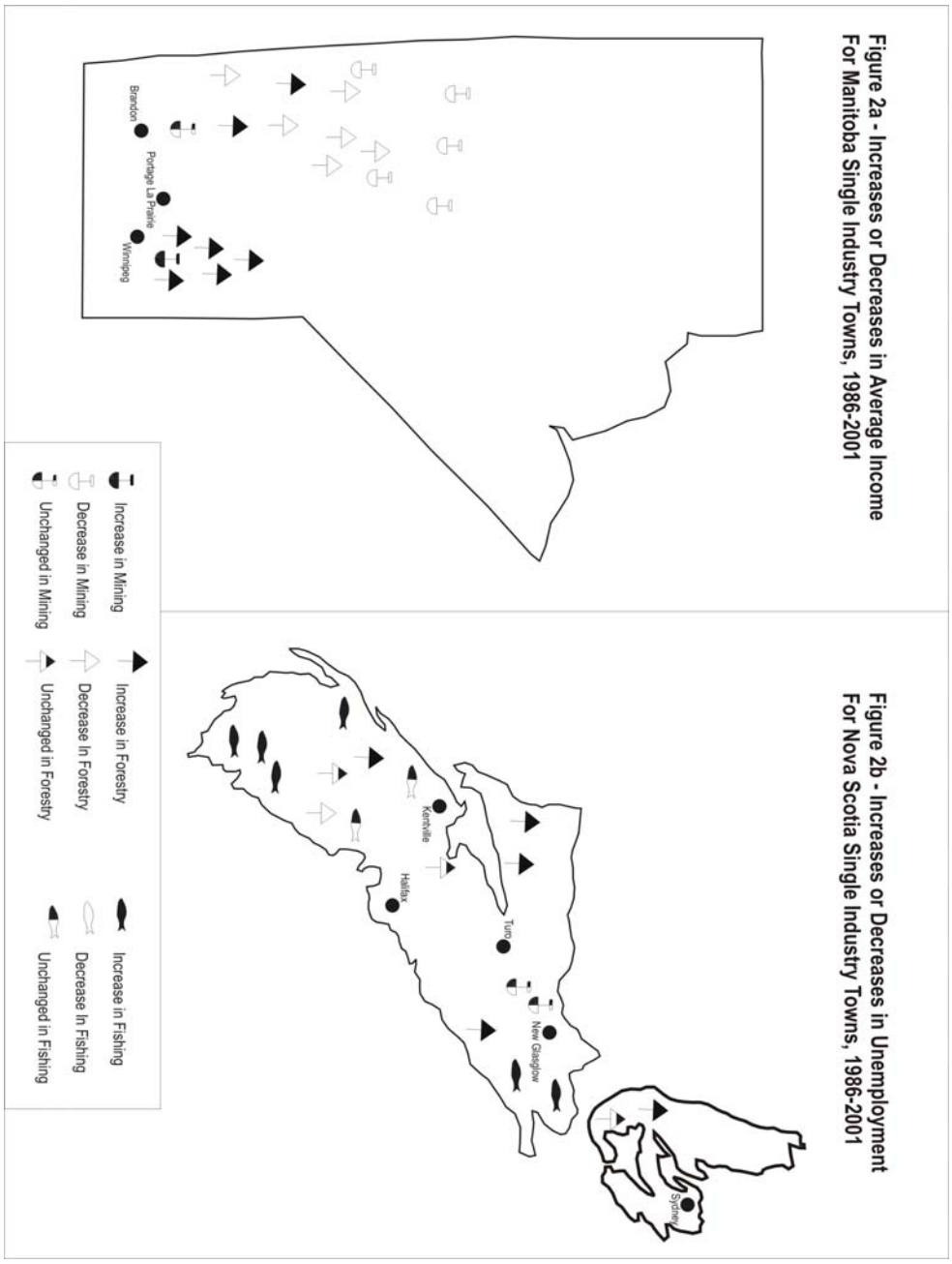


Figure 1 reveals those regions that diversified their economic base and those that continued to concentrate on a single resource. To construct this map, single industry communities were arranged into census divisions for the year 1986. The rationalization for this amalgamation is that a map of the entire country of Canada with 1,198 communities is extremely difficult to interpret. On the other hand, a map of Canada with 266 census divisions is more easily read. Although there are a number of exceptions, when applying the results to Bone's north-to-south axis of Canada (1992), the Ecumene appears to shift further away from primary industry and thus emphasizes its status as the core of Canada. On the other hand, by still concentrating on primary industry the Near North and Middle North are reinforcing their position as Canada's periphery. In today's global economy, these changes ought to create a greater disparity in well-being between Canada's Ecumene and the Near North and Middle North. More and more, companies in the core of Canada and the rest of the world are determining the fate of communities in the Near North and the Middle North (Cowan 2006; Kennedy 2005).



Figures 2a and 2b display the influence that metropolitan areas have on single industry towns. Figure 2a of Manitoba shows that per capita income in single industry towns that were in close proximity to Brandon, Portage la Prairie, and Winnipeg increased over the study period. On the other hand, per capita incomes decreased in single industry towns that were remote and farther away from these same metropolitan areas. When applying the results to Bone's north-to-south axis, again the Ecumene in the South appears to shift farther away from primary industry while the North continues to concentrate on primary industry.

Figure 2b reveals similar results for the unemployment rates in Nova Scotia over time. The unemployment rate in single industry towns that were in close proximity

to Halifax, Kentville, Turo, New Glasgow, and Sydney decreased. While not an ideal situation, when a downturn occurs, employees affected can seek alternative employment opportunities by commuting to the larger cities. On the other hand, the unemployment rate generally increased in outlying single industry towns.

Table 1. A Comparison of SITs in Close Proximity to Metropolitan Areas and Away from Metropolitan Areas

	SIT Proximate to Metropolitan Areas	SIT Not Proximate to Metropolitan Areas
Pop. change 1981-1986	-0.02	-0.74
Pop. change 1996-2001	0.06	-1.25
1986 average income	20,166	20,675
2001 average income	23,518	19,723
1986 unemployment rate	9.3	13.9
2001 unemployment rate	8.7	15.9
1991 % knowledge jobs	21.6	14.1
1996 % knowledge jobs	21.4	13.1
2001 % knowledge jobs	22.4	13.1
Less than grade 9 (1986)	22.7	31.3
Less than grade 9 (2001)	14.7	39.4
Post secondary (1986)	44.0	26.1
Post secondary (2001)	47.5	28.0

SOURCE: Statistics Canada 2001, 1996, 1991, 1986

While results surrounding all metropolitan areas are not this distinct, Table 1 further reveals that a relationship exists between single industry towns and their distance to metropolitan areas. Using Statistics Canada's MIZ classification system, Table 1 reveals that workers in communities that are in close proximity to cities are able to commute to supplementary employment opportunities if the local mill or mine closes. Citizens of settlements farther away have to move in order to find a new job. The result is stability as reflected in a change from a modest population decline to a modest population increase as well as an increasing per capita income for single industry towns in MIZs. More important in Table 1 is the fact that single industry towns in close proximity to cities decreased their unemployment rates, increased the percentage of jobs in the knowledge sector, as well as improved their educational basis.

Results were more volatile and less promising for single industry towns not classified as MIZs. Contrary results include an augmentation in population decline and a decrease in per capita income. Remote single industry towns also increased their unemployment rates and decreased the percentage of jobs in the knowledge

sector. While education attainment increased for remote communities, the extent was well behind those influenced by MIZs.

The results suggest that citizens of single industry towns in close proximity to cities realize the potential benefits and hazards of today's knowledge economy. If the local mill or mine closes, supplementary employment opportunities exist within commuting distance. On the other hand, citizens in remote single industry communities have less reason for optimism when the local mill or mine closes. They are not exposed to the opportunities that exist in diverse communities.

Table 2. Aggregate Population Change (%)

	1981-1986	1986-1991	1991-1996	1996-2001
Concentrating SITs	-4.38	-4.84	-6.56	-8.97
Diversifying SITs	-2.32	-3.14	-4.47	-1.26
Small SITs *(n=682)*	-0.04	-0.07	-0.06	-0.06
Medium SITs *(n=465)*	-0.01	0.00	-0.03	-0.02
Large SITs *(n=51)*	0.00	0.01	0.02	0.00
Fishing SITs *(n=281)*	-0.02	-0.10	-0.08	-0.06
Forestry SITs (n=793)	-0.03	-0.03	-0.02	-0.04
Mining SITs *(n=124)*	0.06	0.03	0.03	0.01

SOURCE: Statistics Canada 2001, 1996, 1991, 1986

Based on education, employment, and demographic data from 1986 to 2001, the following section makes a case for three broad conclusions regarding single industry towns. First, the experiences of single industry communities are problematic, as they are not positioning themselves for success in the future. Second, and more unexpected, was the fact that diversifying single industry towns did not incur substantial gains compared to concentrating single industry communities. From 1996 to 2001, however, it became evident that it was advantageous to be a diversifying community rather than one that continued to concentrate on primary activities. Third, large single industry communities are more viable than small single industry communities. As revealed in Table 2 diversifying single industry communities lost an increasing amount of people from 1986 to 1996. The problem was less severe from 1996 to 2001 when the population decline was smaller than before. More anticipated was the fact that concentrating single industry communities always lost a greater proportion of their population over time while diversifying single industry communities always lost a smaller percentage of their population.

Examining the size of the town revealed that both small and medium communities lost population. However, small communities lost a greater percentage of their population when compared to medium sized communities. On the other hand, the

population in large single industry communities remained constant. Upon exploring the type of the town, fishing and logging communities lost population, while mining communities increased in population. This of course is dependent on the type of mining taking place.

Leaf Rapids in Northern Manitoba is a good example of a community that continued to concentrate in the mining industry over the 15-year study period. Clarke (1985) describes how private companies worked with government officials to build the local economy. However, lacking the ability to diversify, the population plummeted when Hudson Bay and Smelting Company announced the permanent closure of mining operations. Gill and Smith (1985) and Clunie (1976) contend that the inability to broaden the economic base over time was the result of being a small and remote Northern Manitoba community, which lacked large scale urban amenities. This prevented the community from attracting further business. On the other hand, Port Hardy's population exploded in 1969 when Utah Mines developed Island Copper. In 1999, Island Copper closed down and the population of Port Hardy decreased. Nevertheless, the economy had diversified to the point where the town has been able to deal with the closure more adequately than Leaf Rapids.

There are a number of ways to examine the economic well-being of single industry communities. Studying three wood-based communities in British Columbia, Halseth (1999) surveyed citizens perceptions of their economic future. It was revealed that, despite uncertainty, citizens felt that the situation and opportunities for employment were positive and improving over time. By exploring employment and education characteristics, the following reveals a problematic picture for the past, present, and future of single industry communities across Canada.

Providing standardized employment incomes, Table 3 reveals that average incomes for concentrating and diversifying single industry towns increased, with average incomes increasing slightly more for diversifying towns. This finding appears to agree with Bradshaw and Blakely (1999) who argue that it is better to diversify the economic base of a town for its long-term security. Another statistic disclosed in Table 3 is unemployment. It suggests that concentrating single industry towns sustained a high unemployment rate while those towns concentrating less on primary employment over time decreased their unemployment rate. Not reflected in this paper is the fact that a sizable improvement in the unemployment rate occurred between 1996 and 2001 for diversifying towns.

When examining the size of the town, there is again a correlation between size and employment statistics. Small communities possess the largest unemployment rates and lowest average incomes (average incomes actually declined), medium communities maintained the middle unemployment rates and middle incomes, and large communities the smallest unemployment rates and largest average incomes. Two outcomes that are more important are revealed in Table 3. First, the unemployment rate in small and medium sized communities increased over time while it decreased for large cities. Second, there was a large discrepancy in the income change from 1986 to 2001. In 1986, the average incomes were relatively similar. However, by 2001, the average income in large cities was substantially greater than in small communities.

Table 3. Employment Characteristics

	1986 ave. income ($)	2001 ave. income ($)	Unemployment rate 1986 (%)	Unemployment rate 2001 (%)
Concentrating SITs	20,633	21,244	14.7	16.1
Diversifying SITs	20,824	23,111	11.2	10.1
Small SITs *(n=682)*	20,183	19,250	13.0	24.9
Medium SITs *(n=465)*	19,869	23,882	10.2	13.8
Large SITs *(n=51)*	20,621	28,492	10.2	9.8
Fishing SITs *(n=281)*	17,843	19,414	17.70	21.40
Forestry SITs *(n=793)*	21,152	21,902	12.30	12.80
Mining SITs *(n=124)*	20,638	26,394	9.20	9.80

SOURCE: Statistics Canada 2001, 1996, 1991, 1986

Results in Table 3 and Figures 2a and Figure 2b indirectly substantiate economic theory that employers in single industry towns have the leverage to pressure workers into concessions because few alternative opportunities exist. Terrace Bay, Ontario (Clutchey 2006) and Richmond County, Nova Scotia (cbc.ca/nova scotia, 2006) are just two examples of remote single industry towns where negotiations

pressured workers into a decrease in wages. This increasingly common strategy is supported by basic economic theory, which suggests that a change in the supply/demand relationship influences the power structure of these communities. This is obviously different in a diverse municipality where a fair wage is more justified because workers will find alternative work if they feel they are underpaid.

Thus far it is not completely clear if it is worthwhile to endure the cost of diversifying. While not to the extent of concentrating single industry towns, results suggest that the populations decreased anyway and average incomes were only slightly higher. Findings on knowledge employment nullify this theory as a more optimistic future emerges for diversifying towns. Consequently, it is argued that they are shifting to more adequately benefit from today's knowledge economy.

The past several decades have witnessed the Canadian economy transform from one being dominated by the primary sector to one being dominated by the tertiary and quaternary sectors. This has academics such as Colander (2000) questioning neo-classical economics' recognition of labour and capital as the only two factors of production. In the same vein, Romer (1986, 1990) follows Schumpeter (1942) to propose a New Growth Theory to argue that changing the neoclassical model is essential in understanding today's economy. He argues that technology and knowledge production are now essential components of the economic system.

But how is knowledge production quantified? As suggested by Baldwin and Beckstead (2003) there is no perfect measure. One branch of research adopts a firm- or industry-based approach to knowledge production by emphasizing technology use and research and development. Unfortunately, obtaining data to conduct this type of research is difficult at the community level. The alternative uses a labour market perspective using educational attainment and employment to determine which geographical areas specialize in the knowledge economy. This paper uses the latter perspective to determine if single industry communities are shifting to correspond with the knowledge economy. Using educational attainment as well as employment categories, this study applies census data to each CSD to compare knowledge employment concentration and knowledge potential between single industry towns and diversified towns.

To measure knowledge employment concentration this study uses a method proposed by Beckstead and Vinodrai (2003). They define 40 out of a possible 132 job categories in the three-digit National Occupational Categories as being knowledge related (see Appendix 1)[2]. As viewed in Table 3, this study only examines knowledge employment from 1991 to 2001 because before this time occupational categories changed and thus do not allow for an easy temporal comparison. It is important to point out that a large percentage of the labour force in single industry communities is employed in primary industry. Of course, this skews the results of single industry towns because they already have a large percentage of their employment in primary industry and not knowledge jobs. To account for this, knowledge employment was calculated as a percentage of total employment with the exception of primary industry employment.

Table 4 reveals that knowledge jobs constitute a small percentage of total workers in concentrating single industry communities. In addition, the percentage of knowledge workers in these towns has actually decreased when they are increasing in the rest of the developed world. On the other hand, diversifying single industry towns have a much higher percentage of their workers employed in the knowledge sector. Additionally, the proportion of knowledge jobs in these communities increased over time. The results suggest that citizens of diversifying towns are adapting to today's global economy. The increase in knowledge jobs forms a strong parallel with previous results that identify the welfare of these towns.

[2] Note: For a more comprehensive view of the occupational categories, see Table 1A on p. 60 of Beckstead, D. and Vinodrai, T. 2003. Dimensions of Occupational Changes in Canada's Knowledge Economy, 1971-1996. The Canadian Economy in Transition Research Paper Series. Catalogue No. 11-622-MIE2003004. Analytical Studies Branch. (Ottawa: Statistics Canada).

Table 4. Knowledge Jobs (%)

	1991	1996	2001
Concentrating SITs	10.1	9.8	9.4
Diversifying SITs	12.5	13.1	17.3
Small SITs *(n=682)*	14.7	13.7	12.9
Medium SITs *(n=465)*	11.4	15.2	17.1
Large SITs *(n=51)*	12.9	18.5	19.8
Fishing SITs *(n=281)*	13.4	12.9	18.8
Forestry SITs *(n=793)*	17.3	17.1	19.9
Mining SITs *(n=124)*	15.2	16.7	16.6

SOURCE: Statistics Canada 2001, 1996, 1991, 1986

Instead of knowledge employment, single industry communities rely on primary industry. Not reflected in the table is the fact that other than primary industry, the sales and service job category constitutes the second largest percentage of workers in single industry communities. This suggests that these towns rely enormously upon the existing primary industry because sales and service jobs are based on the well-being of the town. If the town's largest employer shuts down, businesses close and new investment is difficult to attract because citizens are spending less. The resulting decrease of people and business shrinks the community's tax base causing the level of services to suffer and soon the existence of the community is threatened (Canada, Employment and Immigration Advisory Council 1987).

Once again, when matching the size of the town to a variable, Table 4 reveals that a relationship exists. Small communities possessed the smallest percentage of their workforce involved in knowledge jobs. Medium communities retained the intermediate, and large communities maintained the largest percentage of their workforce in knowledge jobs. In addition, knowledge jobs increased in medium and large cities. Akin to concentrating single industry towns, the percentage of knowledge workers in small single industry towns has decreased when they are increasing in the rest of the developed world. Concerning type of single industry town and knowledge employment, results were as expected. All three types of towns increased the percentage of population involved in knowledge employment, with forestry towns possessing the greatest percentage of knowledge workers.

As Ferranti et al. (2002) suggested, expanding human resources past the industrial sector is necessary to take advantage of the knowledge economy. One way to create knowledge jobs is to maintain a better-educated workforce. Table 5 reveals the encouraging findings that in all samples the number of individuals completing their education before grade nine decreased while those attending post secondary institutions increased.

However, a discouragingly high percentage of people in concentrating single industry towns obtained less than a grade nine education. At the same time, a small and stable percentage of people attended university. On the other hand, results are more encouraging for diversifying single industry communities because they reveal over time that a decreasing percentage of people completed their education before grade nine and an increasing number of people attended a post secondary institution. This correlates with the previous results on knowledge employment; improvements to transport and communications allow students to embark on a post secondary education over the internet as well as travel farther to more easily obtain a degree.

The size of the single industry community is also a factor in educational attainment. Results suggest that a high percentage of people in small single industry communities obtained less than a grade nine education and a small percentage attended post secondary education. In comparison, large single industry towns had a larger and increasing percentage of their population obtaining their highest level of education from a post secondary institution.

Table 5. Educational Attainment

	Less than grade 9 (1986)	**Less than grade 9 (2001)**	**University education (1986)**	**University education (2001)**
Concentrating SITs	29.9	20.8	13.2	13.8
Diversifying SITs	25.3	14.2	15.4	20.2
Small SITs *(n=682)*	34.8	20.6	9.0	10.2
Medium SITs *(n=465)*	27.8	14.4	13.6	14.2
Large SITs *(n=51)*	27.6	9.2	21.6	23.5
Fishing SITs *(n=281)*	32.4	18.3	13.3	14.1
Forestry SITs *(n=793)*	27.4	11.5	15.2	15.7
Mining SITs *(n=124)*	28.0	9.7	16.6	16.7

SOURCE: Statistics Canada 2001, 1996, 1991, 1986

Less interesting are results regarding type of single industry community and educational attainment. The percentage of population achieving less than a grade nine education decreased for all three types of towns while the percentage of population attending a post secondary institution increased. The only noteworthy difference is the fact that a high percentage of the populations in fishing towns still obtained less than a grade nine education.

5.0 Conclusions

On the surface, results reveal that the future looks brighter for diversifying single industry towns and large single industry towns. This is especially true when one considers the relationship between knowledge employment and community well-being. The results suggest that single industry towns have had little to do with the production of knowledge; the very nature of their existence is the acquisition of resources for the manufacturing of goods. This foundation should theoretically leave these communities at an enormous disadvantage. Additionally, the lack of access to post secondary education facilities and a concentrated economic base makes it difficult for single industry communities to create or obtain the necessary knowledge threshold to compete long term in today's competitive economy.

Especially from 1996 to 2001, it became evident that it was advantageous to be a diversifying community. A contributing factor to this phenomenon is the fact that knowledge jobs played less of a role in diversifying communities before 1996. After 1996, diversifying single industry towns substantially increased the percentage of jobs related to the knowledge economy. Correlating to this shift in employment structure were positive changes to the socio-economic makeup of these diversifying towns. The combination of these towns' forward thinking will enable them to have greater control over their own destiny and compete at the international level.

Before embarking on this study it was thought that divergent results would occur when examining the type of single industry. Forestry, mining, and fishing industries have all endured distinct experiences over the study period. Disparate resources experience distinct booms and busts and one would expect this to influence the towns markedly. However, the results reveal little difference in the experiences of the three different types of single industry communities.

Perhaps most important to the viability to single industry towns is their relative location. Those within commuting distance of urban areas possessed the ability to ward off the busts associated with a resource. In effect, these towns possessed the economic base associated with the larger urban areas because the employment opportunities were available. While not convenient, commuting is an option as compared to living in an environment that is not conducive to moving (e.g., value of housing suppressed). Issues dealing with population, income, employment, and education were all greater for single industry communities close to a large urban area.

It will be interesting to see if findings of this research will pay off in the future. In other words, will the jump in educational attainment and employment in knowledge jobs transcend into growing populations, higher incomes, and lower unemployment in the future? A follow-up study that monitors these communities will allow this question to be adequately answered.

Appendix 1. - Composition of the knowledge worker categories

Major Group Knowledge Worker Category	Occupations (1)
Management K1 Management	A01 Legislators and senior management A11 Administrative services managers A12 Managers in engineering, architecture, sciences and information systems A13 Sales, marketing and advertising managers A30 Managers in Financial and business services A31 Managers in communications (except broadcasting) A32 Managers in health, education, social and community services A33 Managers in public administration A34 Managers in art, culture, recreation, and sport A38 Managers in primary production (except agriculture) A39 Managers in manufacturing and utilities
Professional K2 Business professionals	B01 Auditors, accountants and investment professionals B02 Human Resources and business service professionals
Professionals K3 Science and engineering professionals	C01 Physical science professionals C02 Life science professionals C03 Civil, mechanical, electrical and chemical engineers C04 Other engineers C05 Architects, urban planners and land surveyors C06 Mathematicians, systems analysts and computer programmers
Technical K4 Science-Technical occupations	C11 Technical occupations in physical science C12 Technical occupations in life science C13 Technical occupations in civil , mechanical and industrial engineering C14 Technical occupations in electronics and electrical engineering C15 Technical occupations in architecture, drafting, surveying and mapping C16 Other technical inspectors and regulatory officers C17 Transportation officers and controllers
Professional K5 Health professionals	D01 Physical, dentists and veterinarians D02 Optometrists, chiropractors and other health diagnosing and treating professionals D03 Pharmacists, dieticians and nutritionists D04 Therapy and assessment professionals
Technical K6 Other health occupations	D11 Nurse supervisors and registered nurses D21 Medical technologists and technicians (except dental health)
Professionals K7 Education, law and social science-related	E01 Judges, lawyers and Quebec notaries E03 Policy and program officers, researchers and consultants E11 University Professionals and assistants E12 College and other vocational instructors E13 Secondary and elementary school teachers and counsellors
Professionals K8 Arts and culture professionals	F01 Librarians, archivists, conservators and curators F02 Writing, translating and public relations professionals F03 Creative and performing artists

5.0 References

Andreotti, A. (2004). Globalisation and corporation internalization: a critical viewpoint. *International Journal of Entrepreneurship and Innovation Management*, 4(4), 360-372.

Audetsch, D., B & Feldman, M. P. (1996). Innovative clusters and the industry life cycle. *Review of Industrial Organization*, 11, 253-273.

Baldacchino, G. (2006). Small Islands versus Big Cities: Lessons in the Political Economy of Regional Development from the World's Small Islands. *Journal of Technology Transfer*, 31, 91-100.

Baldwin, J., & Beckstead, D. (2003). *Knowledge workers in Canada's economy, 1971-2001. Insights on the Canadian economy*. Catalogue No. 11-624-MIE2003004, Analytical Studies Branch, Ottawa: Statistics Canada.

Barnes, T. J., & Hayter, R. (1994). Economic restructuring, local development, and resource towns: Forest communities in coastal British Columbia. *Canadian Journal of Regional Science*, 17(3), 289-31.

Barnes, T., & Hayter, R. (1992). The Little Town that Could: Flexible Accumulation and Community Change in Chemainus, British Columbia. *Regional Studies*, 26, 647-66.

Barnes, T. (2005). Borderline communities. Canadian single industry towns, staples, and Harold Innis. In H. Van Houtum, O. Kramsch, and W. Zierhofer (eds.) *Bordering Space.* Aldershot, United Kingdom: Ashgate.

Beckstead, D., & Vinodrai, T. (2003). *Dimensions of Occupational Changes in Canada's Knowledge Economy, 1971-1996.* The Canadian Economy in Transition Research Paper Series. Catalogue No. 11-622-MIE2003004, Analytical Studies Branch, Ottawa: Statistics Canada.

Becley, T. (1994). Community stability and the relationship between economic and social well-being in forest dependent communities. *Society & Natural Resources*, 8, 261-266.

Blakely, E., & Bradshaw, T. (2002). *Planning Local Economic development: Theory and Practice*. New York: Sage.

Boddy, M. (1999). Geographical economics and urban competitiveness: A Critique. *Urban Studies*, 36, 811-842.

Bone, R. (2003). *The Geography of the Canadian North: Issues and Challenges*. Toronto: Oxford University Press.

Bradbury, J., & St. Martin, I. (1983). Winding down in a Quebec mining town. *The Canadian Geographer*, 27, 128-44.

Bradshaw, T., & Blakely, E. (1999). What are "Third-Wave" state economic development efforts? From incentives to industrial policy. *Economic Development Quarterly*, 13, 229-244.

Bucksar, R. (1962). Elliot Lake, Ontario: problems of a modern boomtown. *Journal of Geography*, LXI.

Canada (2006). Accept wage rollback: warden to Stora workers. Webpage available online: < http://www.cbc.ca/ns/story/ns-stora20060511.html>.

Canada (2002). Ottawa Facing Clean-up bill for Toxic Sites. Webpage available online: <http://www.cbc.ca/story/canada/national/2002/10/21/toxic_ag021021.html>.

Canada, Employment and Immigration Advisory Council (1988). *Canada's Single Industry Communities: In Search of a New Partnership*. Ottawa: Supply and Services Canada.

Canada, Employment and Immigration Advisory Council (1988). *Inventory: Canadian Association of Single Industry Towns (CASIT)*. Saskatoon: Canadian Association of Single Industry Towns.

Canada, Employment and Immigration Advisory Council (1987). *Canada's Single Industry Communities: A Proud Determination to Survive*. Ottawa: Supply and Services Canada.

Canada, Department of Regional Economic Expansion (1979). *Single Industry Communities*. Ottawa: Supply and Services.

Carnevale, A., & Desrochers, D. (2002). *The Missing Middle: Aligning Education and the Knowledge Economy*. Washington: U.S. Department of Education no. ED-99-CO-0160.

Clark, W. (1985). Leaf Rapids Development. The Canadian Mining and Metallurgical Bulletin, 68.

Clemenson, H. (1992). Are single industry towns diversifying? An examination of fishing, forestry, and mining towns. In R. Bollman (ed.) *Rural and Small Town Canada*. Toronto: Thompson Education Publishing, 151-166.

Clutchey, C. (2006). Union takes aim at Ramsay. *The Chronical Journal*, B1.

Clunie, D. (1976). Two northern communities. *Contact*, 8.

Coffee, W., & Polese, M. (1988). Locational shifts in Canadian employment, 1971-1981, decentralization vs. decongestion. *The Canadian Geographer*, 32(3), 248-255.

Colander, D. (2000). The death of neoclassical economics. *Journal of the History of Economic Thought*, 22, 127-143.

Cowan, L. (2006). Forest industry struggling. *Northern Business Journal*, March, 1-2.

Decter, M. (1993). What we can do for ourselves: diversification and single industry communities - the implications of a community economic development approach and the vulnerability checklist: a tool for self assessment. In Regional Development from the Bottom Up: Selected Papers of the Local Development Series, Vancouver: Centre for Community Enterprise.

Daigle, P. (1988). Maximizing community development requires professional skills. *Commerce Magazine*.

Demographic Yearbook (2002). New York: United Nations.

Drache, D., & Gertler, M. (1991). The world economy and the nation state: the new International order. In D. Drache and M. Gertler (eds.) *The New Era of Global Competition: State Policy and Market Power*. Montreal: McGill-Queens University Press, 3-25.

Feldman, M. P. (1994). *The Geography of Innovation.* Boston: Kluwer Academic Publishers.

Ferranti, D., Perry, G., Lederman, D., & Maloney, W. (2002). *From Natural Resources to the Knowledge Economy: Trade and Job Quality*. Washington: World Bank.

Florida, R. (2005). *Cities and the Creative Class.* New York: Routledge.

Florida, R. (1995). Towards the learning region. *Futures*, 27(5), 527-536.

Foray, D., & Lundvall, A. (1996). *The Knowledge-based Economy: From the Economics of Knowledge to the Learning Economy, Employment and Growth in the Knowledge-Based Economy*. OECD, Paris.

Freudenburg, W. (1992). Addictive economies: extractive industries and vulnerable localities in a changing world economy. *Rural Sociology*, 57, 305-332.

Friedman, T. (2005). *The World is Flat: A Brief History of the Twenty-First Century.* New York: Farrar, Straus, and Giroux.

Friedmann, J. (1966). *Regional Development Policy: A Case Study of Venezuela.* Cambridge, Mass: MIT Press.

Garrett-Petts, W. (2005). *The Small Cities Book: On the Cultural Future of Small Cities.* Vancouver: New Star Books.

Gertler, M. (2001). Growing smarter? Learning from growing prosperity: the battle for growth with equity in the 21st century. *Antipode*, 33(1), 84-89.

Gill, A., & Smith, G. (1985). Residents evaluative structures of Northern Manitoba mining communities. *Canadian Geographer*, 29, 17-29.

Glaeser, E., Kallal, H., & Scheinkman, J. (1992). Growth of cities. *Journal of Political Economy*, 100, 1126-1152.

Goulet, K. (1997). Participation of Northerners and Aboriginal People in Uranium Development in Saskatchewan. In The Uranium Institute Twenty-Second Annual Symposium, London.

Goldstone, R., & Janssen, M. (2005). Computational models of collective behavior. *Trends in Cognitive Sciences*, 19, 424-430.

Gracie, G. (1982). The History of Uranium City and District Lakeland Press, La Ronge, Saskatchewan, 1982.

Hall, P. (1966). *The World Cities*. London: Weidenfeld and Nicolson.

Halseth, G., & Hanlon, N. (2005). The greying of resource communities in Northern British Columbia: implications for health care delivery in already underserviced communities. *Canadian Geographer*, 49, 1-24.

Halseth, G. (2005). Resource town transition: Debates after closure. In S. Essex, A. Gilg, R. Yarwood, J. Smithers, and R. Wilson (eds.) *Rural Change and Sustainability: Agriculture, the Environment and Communities*. Oxfordshire, UK: CABI Publishing, 326-342.

Halseth, G. (2002). *Building Community in an Instant Town: A Social Geography of Mackenzie and Tumbler Ridge, British Columbia.* Prince George, BC: UNBC Press.

Halseth, G. (1999). Resource town employment: perceptions in small town British Columbia. *Tijdschrift voor Economische en Sociale Geografie*, 90, 196-210.

Hamelin, L. (1979). *Canadian Nordicity: It's your North Too*. Montreal: Harvest House.

Harvey, D. (1990). *The Condition of Postmodernity: An Enquiry into the Conditions of Cultural Change.* Oxford: Blackwell.

Hayter, R., & Barnes, T. (1990). Innis' staple theory, exports, and recession: British Columbia, 1981-86. *Economic Geography*, 66, 156-173.

Hayter, R., & Barnes, T. (2001). Canada's resource economy. *Canadian Geographer*, 45, 36-41.

Hayter, R. (1996). Technological imperatives in resource sectors: forest products. In J. Britton (ed.) *Canada in the Global Economy: The Geography of Structural Change and Technological Change.* Montreal: McGill Queen's Press, 101-122.

Hayter, R. (2000). *Flexible Crossroads: The Restructuring of British Columbia's Forest Economy*. Vancouver: UBC Press.

Henry, N., & Pollard, J. (2000). Capitalizing on knowledge. *Geoforum*, 31, v-vii.

Innis, H. (1956). The teaching of economic history. In M. Innis (ed.) *Canada In Essays in Canadian Economic History.* Toronto: University of Toronto Press, 3-16.

Kennedy, P. (2005). Domtar to slash 1,800 jobs, cut output. *Toronto Star*, December 1, 2005, B1.

Kuyek, J., & Coumans, C. (2003). *No Rock Unturned: Revitalizing the Economies of Mining Dependent Communities*. Ottawa: Mining Watch Canada.

Locke, W. (1986). *Let's Recycle our Throwaway Communities and Disposable Workers: Policies for Dealing with Mining Communities*. Royal Commission on Employment and Unemployment, Newfoundland and Labrador.

Lucas, R. (1971). *Minetown, Milltown, Railtown: Life in Canadian communities of single industry*. Toronto: University of Toronto Press.

Ludwig, D., Hilborn, R., & Walters, C. (1993). Uncertainty, resource exploitation, and conservation: lessons from history. *Science*, 260, 17-6.

Malmberg, A (1997). Industrial geography: location and learning. *Progress in Human Geography*, 21(4), 573-582.

Markey, S., Pierce, J., Vodden, K., & Rosesland, M. (2005). *Second Growth: Community Economic Development in Rural British Columbia*. Vancouver: UBC Press.

McCann, L. (1978). The changing internal structure of Canadian resource towns. *Plan Canada*, 18, 46-59.

McCann, L. & Gunn, A. (1997). *Heartland and Hinterland: A Regional Geography of Canada*. Prentice Hall: Toronto.

Mulkey, S. & Murphy, D. (2002). Community Survey of Rural Community Economic Development in North America. S.I. Columbia Basin Rural Economic Development Team.

Myrdal, G. (1957). *Economic Theory and Under-developed Regions.* London: Duckworth.

Norberg-Hodge, H. (2003). Shifting direction: from global dependence to local interdependence. In J. Mander and E. Goldsmith (eds.) *The Case Against the Global Economy: And for Local Self-reliance.* London: Earthscan Publications, 241-253.

Norcliffe, G. (1994) Regional labour market adjustments: the Canadian case. *Canadian Geographer*, 38, 2-17.

Norcliffe, G. (1983). Industrial specialization versus industrial diversification: an assessment of policy alternatives. In B. Barr and N. Waters (eds.) *Regional: Diversification and Structural Change.* Vancouver: Tantalus Research Ltd., 7-24.

OECD (1996). The Knowledge Based Economy. OECD/GD.

Pretty, J. (2003). Saving our small farms and rural communities. In J. Mander and E. Goldsmith (eds.) *The Case Against the Global Economy: And for Local Self-reliance.* London: Earthscan Publications, 275-288.

Randall, J., & Ironside, R. (1996). Communities on the edge: an economic geography of resource-dependent communities in Canada. *The Canadian Geographer*, 40, 17-35.

Reich, R. (2000). *The Future of Success: Working and Living in the New Economy*. New York: Vintage House.

Reich, R. (1991). *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. New York: Vintage House.

Robinson, I. (1962). *New Industrial Towns on Canada's Resource Frontier*. Chicago: University of Chicago Press.

Robson, R. (1986). *Canadian Single Industry Communities: A Literature Review and Annotated Bibliography*. Sackville: Mount Allison University, 1-26.

Romer, P. (1986). Increasing returns and long run growth. *Journal of Political Economy*, 94, 1002-1037.

Romer, P. (1990). Endogenous technical change. *Journal of Political Economy*, 98, S71-S102.

Samson, R. (1998). *Assessment of the Contribution of the Natural Resource Sectors to Canadian Communities*. Ottawa: Canadian Forest Service, Natural Resources Canada.

Sassen, S. (2000). Cities in a World Economy, Thousand Oaks, CA: Pine Forge Press.

Schumpeter, J. (1942). *Capitalism, Socialism, and Democracy*. New York: Harper.

Simmie, J. (1994). Knowledge spillovers and reasons for the concentration of innovative SMEs. *Urban Studies*, 39, 885-902.

Statistics Canada (2001). *Population: Census Divisions and Subdivisions*. Ottawa: Minister of Supply and Services.

Statistics Canada (1996). *Population: Census Divisions and Subdivisions*. Ottawa: Minister of Supply and Services.

Statistics Canada (1991). *Population: Census Divisions and Subdivisions*. Ottawa: Minister of Supply and Services.

Statistics Canada (1986). *Population: Census Divisions and Subdivisions*. Ottawa: Minister of Supply and Services.

Wallace, I. (1998). The Canadian Shield: the development of a resource frontier. In L.D. McCann and A. Gunn (eds) *Heartland and Hinterland: A Geography of Canada* 3rd edition. Toronto: Prentice-Hall of Canada, Toronto, 227-267.

Williamson, T., & Annamraju, S. (1996). *Analysis of the Contribution of the Forest Industry to the Economic Base of Rural Communities in Canada*. Working Paper No. 43, Ottawa: Industry, Economics and Programs Branch, Canadian Forest Service, Natural Resources Canada.

Williamson, T. B., & Annamraju, S. (1996). *Analysis of the contribution of the forest industry to the economic base of rural communities in Canada*. Working Paper 43. Ottawa: Natural Resources Canada, Canadian Forest Service, Industry, Economics and Programs Branch.

Zipf, G. K. (1949). *Human Behaviour and the Principle of Least Effort*. Reading, MA, Addison-Wesley.