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Functional Regions as a Structure for Enhancing Economic Development in Atlantic Canada

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Executive Summary

Overview

There are many elements involved in organizing public policy to support regional economic development. One crucial choice is deciding how to define the regional boundaries that will represent the units of analysis. In many cases, existing political units are used – cities, counties, or some combination of cities or counties. Typically, regions are defined as aggregations of units of local governments, reflecting the fact that individual local governments are too small to sustain independent economies. In this report, we adopt a different approach to defining regions that starts with the local labor market, as measured by observed commuting patterns. The logic of this approach is that commuting patterns describe the extent of a labor market, with each labor market identifying a number of local governments that are economically integrated, and which in turn form a natural region based on observed individual behavior.

Local labor markets can be thought of as local economies because the majority of the workforce both lives and works within the boundaries. If we suppose that improving levels of income and employment is the main objective of regional economic policy then there is a natural connection between the local labor market and the regional policy unit (Freshwater, 2008). Importantly, local labor markets vary considerably in terms of both population and geographic size. In Atlantic Canada, the largest local labor market is centered on Halifax and contains over 400,000 people. The smallest local labor markets, in isolated parts of New Brunswick and Newfoundland and Labrador, can have less than 200 people. This results in a hierarchy of local labor markets/local economies that have very different functions, capacities and opportunities.

In all regions increased economic output comes from either increases in the number of workers, or increased output per worker – productivity. For Atlantic Canada demographic trends suggest that increases in the size of the workforce are unlikely, except in a few regions, and then only if in migration occurs. This means that increasing productivity is the only opportunity for future economic growth in most regions. For smaller regions productivity is especially important, because it is a major source of the competitiveness necessary to ensure medium and long term viability. This leads to our focus on understanding differences in levels of productivity among regions. Notably, high productivity can occur in regions in any size class. This means that productivity is not restricted to large regions and that policy should be structured to help regions of any size increase their productivity.

Our analysis identifies 259 distinct local labor markets in Atlantic Canada. With further analysis, these regions can be grouped into five major categories (Figure 1). The categories form a hierarchy, with the regions in the Urban Centre category having a large urban place as their focal point as well as an extensive and strongly

connected hinterland, including a number of smaller cities and towns. In the smallest category – Third Order Rural, there are only isolated small settlements that have no labor force connections to other regions, although residents do travel to other regions for shopping and public services.

Figure 1: The Five Categories of Functional Region in Atlantic Canada

	Number of Regions	Average Population	Range In Size
Urban Centres	11	132,541	412,000 - 101,620
Small Cities & Regional Towns	29	22,237	39,805 - 9,225
First Order Rural	31	4,568	7,950 - 2,140
Second Order Rural	39	1,055	2,139 - 1,810
Third Order Rural	149	236	600 - 95

The approach offers a new way to think about regional policy in Atlantic Canada. It shows that regions of a similar size, irrespective of what province they are in, share important similarities. These similarities are strong enough that it is possible to identify tailored sets of policies that are suitable for each of the five specific categories of region. The other side of the coin is that dissimilar regions, even though they are geographically adjacent, require different policies. This points to one of the key weaknesses of past approaches to defining economic development regions in the provinces of Atlantic Canada. Provincial governments have typically aggregated administrative units into a small number of geographically large regions and delivered economic development policy at this level. The approach resulted in an administratively efficient structure, but it also resulted in regions that were made up of a large number of highly diverse local labor markets, many of which were ill-served by the policies on offer.

The alternative proposed here is to first recognize that adjacent local economies can be very different and consequently need different sets of policy support. Also because the 259 local labor markets in Atlantic Canada can be categorized into one of five groups, governments only need to establish five broad sets of policy frameworks to deal with most regional economic development situations. Moreover, the categories identify to each region which other regions are its peers and competitors. In most cases these are not adjacent regions, and may not even be in the same province. Thus local governments are provided with two important pieces of information. The first is the identity of the specific communities that make up their local labor market. This identifies their best partners for collaboration,

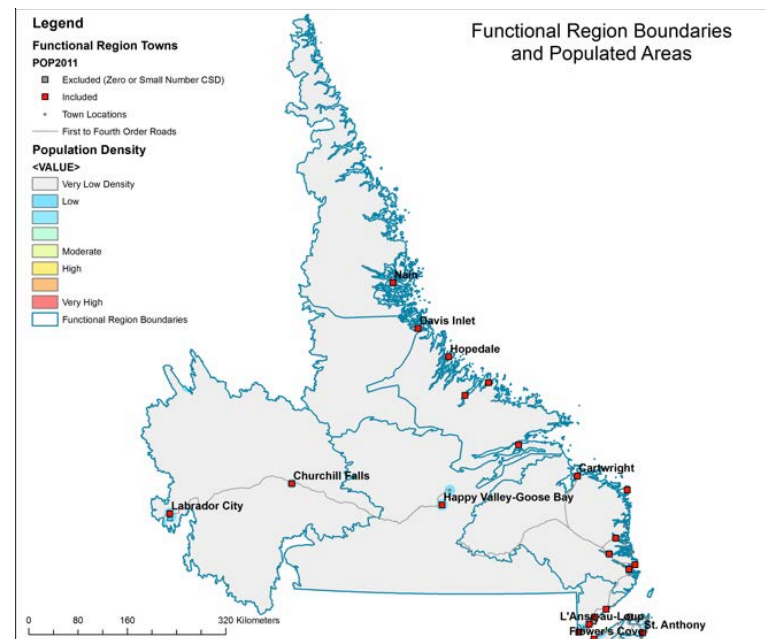
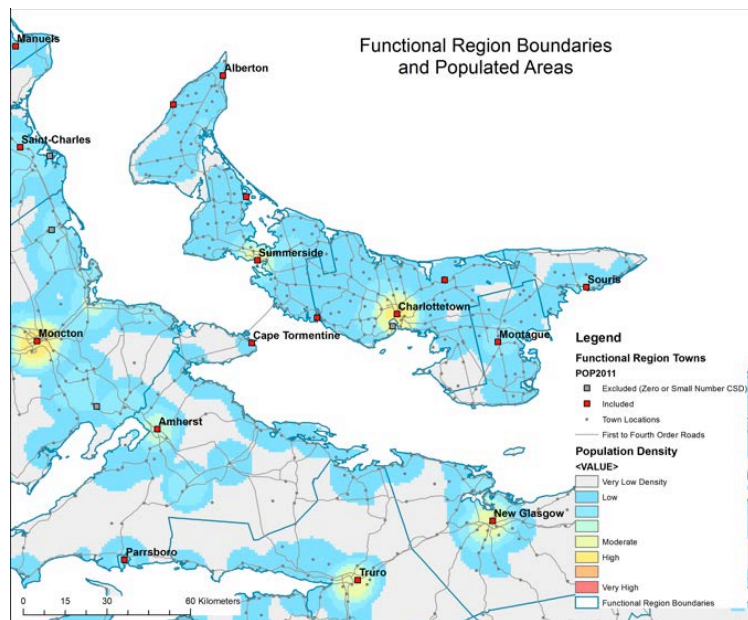
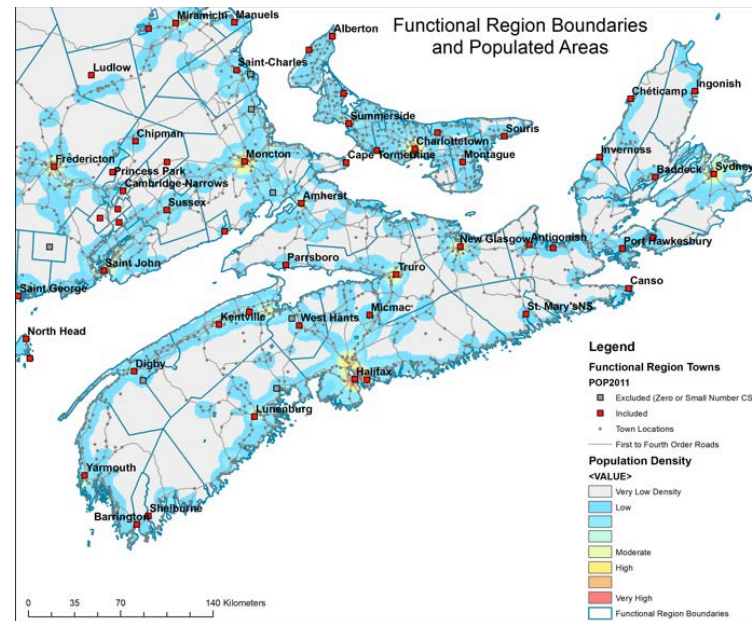
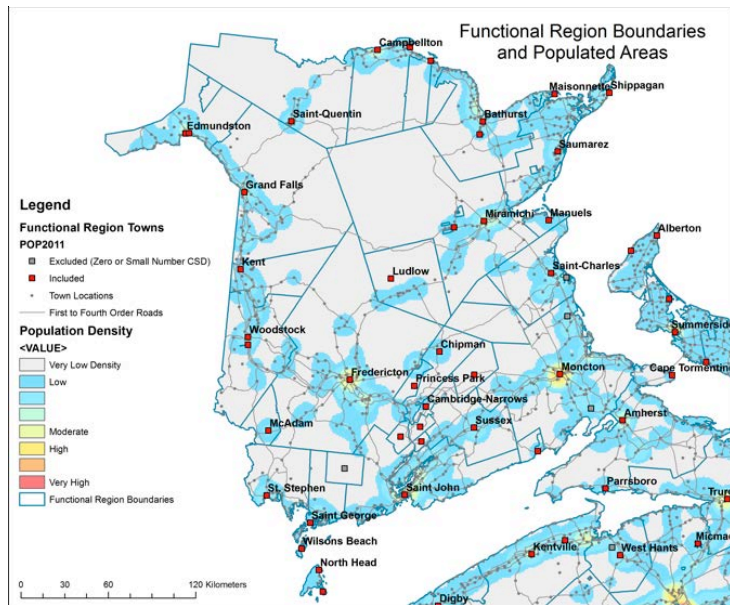
because the benefits from growth anywhere in each region are shared by all participants via labor market flows. The second is peer regions that exist at the same level in the regional hierarchy. Peers offer the potential for: joint learning, emulation of best practices and a sense of the level of competition among regions serving similar functions.

The Methodology

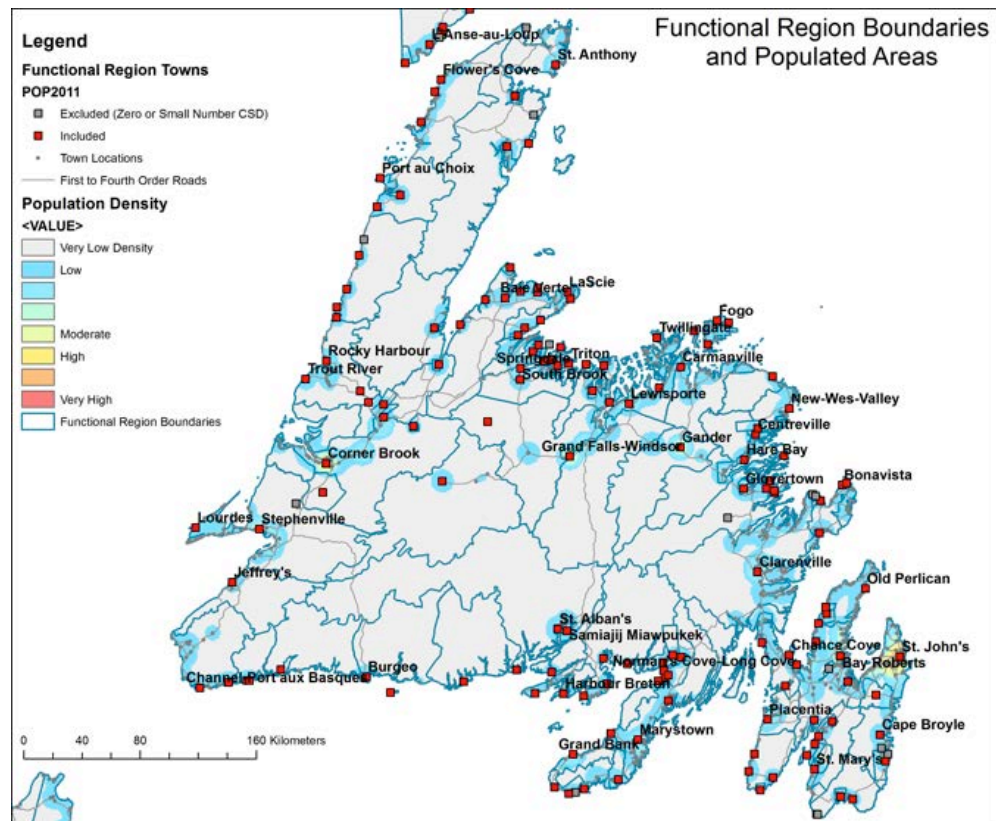
Defining Regions

Statistics Canada collects journey to work data in each decennial census that is made available at the Census Sub-Division (CSD) level. CSDs roughly correspond to political boundaries for local governments. We employ the Intramax clustering algorithm to group CSDs on the basis of commuting flows. The algorithm is adjusted to optimize the number of regions on the basis of daily commuting flows – typically under 100km or one hour of travel each direction.

Maps 1a, 1b, 1c, 1d, 1e show the functional regions by province and identify the location of significant settlements. These maps also provide a sense of actual population densities. Economic activity is highly dependent upon population concentrations and the maps suggest that large areas of all provinces but Prince Edward Island remain relatively unsettled. The final point to be taken from the maps is the highly variable size of the functional regions. Notably the relationship between size of region and population roughly follows a U shape. Remote low population regions tend to be relatively large geographically because there are few and only small settlements and people can be forced to travel long distances for work. At the other extreme, metropolitan regions can also be quite large because of the attractive power of a large city as a source of high wage jobs. Note that there are obvious exceptions to this pattern.



Newfoundland



The Regional Hierarchy

A central objective of the analysis is to provide a mechanism to group regions into small number of sets where regions in each category have a high degree of similar and there are clear differences among categories. To measure economic structure a region we identify all the firms present in the Statistics Canada Business Registry. This data base allows the type of firm to be identified at the six digit NAICs level which provides a high degree of separation. We use differences in economic structure among regions and a two-stage clustering algorithm to construct groups regions. The result is five categories that have a strong degree of separation – that the members in each category are statistically distinct from members in other categories. While economic structure was used to identify categories and their members, population provides a simple synopsis of the categories. Importantly this suggests that population is strongly correlated with economic structure and other important attributes of regions.

While each region is a distinct labor market with minimal connection to other labor markets the regional hierarchy reflects the fact that regions are systematically linked through the flow of goods and services and the movement of people to obtain them. For example, Halifax is the dominant urban center in Atlantic Canada and all of Atlantic Canada obtains some high order goods and services through Halifax. Similarly, regional trade centers, like Corner Brook NL, Miramichi NB, Summerside PE or Yarmouth NS, also provide important retail and public service functions to residents of nearby regions, even though the labor markets are independent.

Urban Centres– There are 11 relatively large urban regions in Atlantic Canada. Centres with populations ranging from 412,200 to 101,620 are Halifax NS, St. John's, NL, Moncton NB, Saint John NB, Fredericton NB and Sydney NS (Cape Breton functional region). In addition, there are 5 other functional regions classified as urban, because of their industrial and service diversity, and they are: Charlottetown PE, Kentville NS, Lunenburg NS, Truro NS, and New Glasgow NS. The population of these 5 smaller urbanized regions ranges from a high of 77,150 to a low of 45,645. By international standards these are all small metropolitan regions (OECD 2012b) , but in the context of Atlantic Canada these are the largest urban places and each provides higher order goods and services to surrounding regions.

Small Cities and Regional Towns - There are 29 functional regions classified as small cities and regional towns with regional populations ranging from 39,805 to 9,225. These regions are characterized by having at least one reasonably sized town that is a focal point for public services and higher order retail for its region, and for adjacent smaller regions. Some of the regions in this category are quite distant from one of the urban centre regions and have a significant spatial reach into other smaller regions. Other members of this group are relatively close to a larger region that dominates the broader territory. In this latter case their opportunities for growth hinge on what happens in the larger urban centre. If it grows they are weakened, but if it declines they may have the opportunity to capture additional markets.

Rural 1 – There are 31 first order rural regions in Atlantic Canada. These regions have populations ranging from 7,950 to 2,140, and contain communities having populations that range from 27 to 6,994 people distributed across an otherwise sparsely populated countryside. They are the small service centres for retail and government services for their own residents and some surrounding regions and have the most diversified economies of the rural categories.

Rural 2- There are 39 second order rural regions in Atlantic Canada. The population of these functional regions ranges from 2,140 to 1,810. In many cases these have only a few single industry towns where employment is dominated by a single firm. Again, these regions are sparsely populated with limited connectivity between communities. People have to leave their region to obtain all but the most basic retail goods and most public services. The population range of individual communities in this type of region is between 27 and 528 people.

Rural 3 – There are 149 third order small rural regions in Atlantic Canada . These regions are comprised of either one or two CSDs. They have total regional populations of less than 600 with settlement sizes ranging from 15 to 583, and very weak economic activity. A majority of these regions are remote. There are single CSDs that are relatively close to higher order regions, but are outside the local labor market of the larger region. Residents in these regions do travel to other regions to obtain virtually all goods and services from outside the region because very little is available locally. These regions have the highest variability in condition. Some have a small but relatively productive local economy while others have almost no earned

income from the private sector. Some face imminent extinction because they are dominated by people too old to work, while others have a growing population. In all of these regions a common element is the complete lack of critical mass to assemble a strong local economy.

Differences in Productivity

A standard measure of worker productivity is GDP per worker. While this measure has flaws it is relatively easy to calculate. An alternative measure of productivity is the average wage per worker, supposing that more productive workers command higher wages. By either measure there are wide divergences in productivity across the regions of Atlantic Canada. On average, productivity is higher in larger regions than in smaller, but the variability of productivity increases as the rank in the regional hierarchy falls. This means that there are high levels of productivity in all five categories of region, and we cannot conclude that small and more rural regions are necessarily less productive than larger more urbanized regions.

Three points come from this observation. The first is that productivity is somewhat independent of size of region, allowing even small rural regions to be competitive and have a strong economic future. The second is that because productivity varies significantly within a size class there may be opportunities for improving the competitiveness of lagging regions within a class, because all class members have similar attributes. The third point reflects the fact that outlier regions in all classes tend to overlap even though the central parts of the distributions do not. This means that over time these outlier regions may move from one class to another. For example, over time the weakest members of the large urban category are likely to drop into the small urban and regional town category if their economic situation does not improve. Conversely, the most productive member of the Rural 2 group can be expected to grow and move into the Rural 1 category.

From the analysis it seems that differences in productivity among regions are largely invariant with respect to the measure of productivity, either GDP per worker or average wage. By examining change in GDP per worker from 2003-2007 we have a measure of productivity change. Implicitly regions where productivity is growing have a brighter future than where it is declining. Once again, larger regions have higher average increases in productivity, but within category variability increases as rank in the hierarchy declines. Some rural regions have very high increases in productivity, especially those with an expanding mining economy.

A number of plausible factors could explain differences in productivity. The first is a relatively small number of workers in the regional population. In small places there can be a high number of retired workers who have retirement earnings that stimulate local economic activity even if transfer payments are not part of GDP. Second, productivity in the natural resource sector is high as capital is substituted for labor in agriculture, forestry, mining, energy production and fishing. While some resource based regions have experienced significant declines in recent years, these might be expected to be the least productive with those remaining having higher productivity. Third, seasonal employment is also high in rural Atlantic Canada and

this may depress average wages, because of the short work interval, by more than it depresses productivity. Fourth, small size may be an advantage in increasing productivity if there is an entrepreneurial culture. In a small economy the actions of individuals can influence the aggregate outcome. If a small number of people introduce new activity this could have a considerable impact on local results. Only some of these potential sources of productivity gains can be measured with existing data sources.

At this stage we cannot conclude that there is a dominant driver of differences in productivity across regions in the same size category. The descriptive data we have examined suggests that there are large differences in the magnitude of each of these factors within a category but there does not seem to be a single dominant effect and the effects of any factor are not clearly correlated with the movement of other factors. This suggests that more complex models of the factors that drive productivity in the regions of Atlantic Canada will be needed before policies can be clearly formulated (Freshwater and Simms 2013).

Forming Policy for Functional Regions

The Policy Context

The four provinces of Atlantic Canada are typically seen as one of five large sub-national regions in Canada (six when the northern territories are included), each of which requires some spatially differentiated policy treatment by the federal government. ACOA and the other federal regional development agencies reflect one way that the Government of Canada has carved out region specific policy. Within Atlantic Canada each of the provinces is a distinct political unit having specific rights and responsibilities under the constitution. This leads to policies that have a distinct provincial focus. Below the provinces are various administrative regions that have been defined by each province to organize local government, or to deliver specific public services. In all of these instances there is the recognition that space affects the ability of a government to deliver policy to the target audience, and that differences among regions can necessitate differences in policies, or in policy delivery mechanisms.

To facilitate policy delivery, national and provincial governments typically use only a small number of policy subcategories on the grounds that this results in more uniform treatment across communities and allows fixed administrative costs to be spread over a large base. In some cases these policy subcategories are in the form of different policy options for some of the target group. In other cases the same policies are provided to all, but through regional service centers. The basic problem with this approach is that it can result in ineffective policy, either because the wrong programs are on offer or because the administrative boundaries of the region do not correspond to how people and firms interact across space.

Why Regions of Unequal Size?

Atlantic Canada has been divided into 259 distinct regions, each of which comprises a local labor market. Within each region, the majority of those employed both live and work in the region. These regions differ greatly in geographic size, population and economic function. The largest region, centered on the city of Halifax, has 412,000 people and stretches across Nova Scotia to the Bay of Fundy. The major part of this region is the Halifax Regional Municipality (HRM), which itself represents an extended territory greater than the urbanized portion of the city, and has 390,000 people. The urbanized portion of the HRM, the former cities of Halifax, Bedford and Dartmouth, has a population of 298,000. While the former cities account for the majority of the population and economic activity of the Halifax functional region, there is still a considerable number of people and degree of economic activity in more rural territory that is strongly connected to the urban core. On the other hand, the smallest functional economic regions have populations of less than 200 and are found along the coast of Newfoundland. They contain very small settlements with weak local economies, very low levels of employment and very little activity or population in open territory outside the small communities.

The use of small regions is a distinct feature of the analysis. Typically regional analysis aggregates small rural regions into large units in order to construct regions of similar size. The belief is that this results in regions that can achieve “scale” effects. But where the resulting region is only weakly integrated economies of scale will not be achieved. Certainly an important policy objective is to build regions that are as efficient as possible, but when local labor markets are small and poorly connected it is only possible to construct larger regions if first the local labor markets become better linked.

The large number and high degree of diversity in the size of regions is especially important for policy formation. No government can design individual policy responses for this many regions. What is needed is some mechanism for grouping regions into a small number of groups that have similar members. The government can then offer a tailored policy menu to each group. While geographic proximity has typically been used by governments in forming its groups we believe this is not the best approach for economic development policy. Places near to each other can be in very different economic circumstances and have different development options.

Economic Growth Opportunities Vary By Size of Region

An important lesson for policy from this size distribution is that while a large share of national or provincial population and economic activity is found in a small number of large regions – those with the highest rank, the large number of smaller regions, in aggregate, also account for a considerable share of aggregate population and economic activity. In a similar approach, the OECD has shown that between 1995 and 2007 the largest regions, 8% of the total number, accounted for 32% of economic growth in the OECD, while the remaining regions account for 68% of growth (OECD, 2012a).

In addition, the OECD has shown that regions can be usefully divided into those with above average growth and those with below average growth (OECD, 2012a). Regions with an initial per capita GDP of 75% or less of the national average in 1995 are said to have Low Catching Up Potential (LCUP), while those regions with per capita GDP above 75% of the average, but below the average level of per capita GDP in 1995, are said to have Catching Up Potential (CUP) (OECD, 2012, pp. 38-39). Prior analysis of specific regions by the OECD suggests that developing integrated approaches to regional development are important in stimulating growth (OECD 2009a, OECD 2009b). For lagging regions crucial bottlenecks take the form of: weaknesses in human capital, especially for those at the bottom of the skill distribution; low rates of labor force participation; weaknesses in innovation at the regional level; low levels of worker productivity; limited connections to larger markets; and, in some cases, the absence of infrastructure – if other growth impediments are not binding (OECD, 2012a pp. 60-61).

The Importance of Focusing on Productivity

The second major innovative policy prescription in our analysis is that national and provincial support for local economic development should focus on increasing productivity. In an environment of a shrinking workforce that characterizes Atlantic Canada, the main way that economic prosperity will occur is through higher levels of output per worker. In particular, increasing levels of productivity will be the main means by which people and firms in small and remote regions will survive. Our focus on productivity reflects the fact that we are dealing, for the most part, with small and very small economies. In only the largest size category is the population large enough to be considered to have any endogenous growth potential. In all other cases the fate of individual firms largely determines the fate of the region in which they are located. Productivity is the largest factor influencing competitiveness that can be influenced by the firm. Distance to market, the behavior of competitors, the stage of the business cycle and macroeconomic policy are all important, but the firm cannot influence them. It can influence productivity, and regional economic development policy can help or impede the efforts of the firm.

In a series of studies the UK government identified productivity as a key driver of economic growth (HM Treasury 2000, through 2004). Yet, in the past, regional policy has tended to emphasize increasing the number of employed people as the main economic objective. The emphasis on employment was understandable in a period of high unemployment, a growing workforce and relatively strong job opportunities in natural resource extraction and first stage processing. But, going forward one of the crucial challenges for Atlantic Canada is a shrinking population and more importantly an aging and shrinking workforce. In addition, Canada is a relatively high wage environment when compared to developing countries, so future opportunities for the employment of unskilled, low productivity workers in tradable sectors will remain limited.

Fostering Development at the Regional Level

The five types of region require different policy approaches because their conditions and opportunities are different. Dealing with this reality requires that government take its existing suite of policies and develop five subsets that target specific combinations of policy to each element of the urban hierarchy. This approach can provide a region with appropriate support without imposing the large costs of designing and delivering unique policy responses to every region on the government.

Notably, we believe that in terms of pure economic development policy, the government should focus its efforts on the three middle categories. The large urban regions already have significant internal development capacity and each of the eleven members has an almost unique situation in terms of problems and opportunities. These regions are to a significant degree capable of at least some endogenous growth based on their own capability. This makes it virtually impossible to design a single policy strategy for the category. Third Order Rural regions offer limited opportunities for policy intervention for almost opposite reasons. In many cases there are no meaningful opportunities for economic growth. Moreover, in these regions there is little local government capacity to partner with. If growth occurs it is most likely to be idiosyncratic and driven by a single firm that identifies a specific opportunity. Finally while there are large numbers of Third Order Rural Regions they are all very small, which makes it expensive to deliver any policy support.

By contrast the three medium size categories: Small Cities and Regional Towns, First Order Rural and Second Order Rural, each contain a significant number of members having a relatively high degree of homogeneity. Moreover, these regions have large enough economies and populations that they can support growth, especially if it fosters further integration within and across regions. Local government in these regions lacks the resources to act strategically, but it has the capacity to partner with federal and provincial agencies. This capacity is crucial if federal and provincial agencies are to support development efforts rather than actually carry them out.

Importantly, by providing a suite of support tailored to the different needs and capabilities of regions of different size, government avoids the problem of picking winners. Regions with similar needs are offered similar support. Some will choose to take the support, others may not. Some that take the support will succeed, in part because of the support, but others will not. Federal and provincial governments are in essence betting on the pool of regions, and not on individual regions. Competition among regions is inevitable and growth cannot occur in all regions. What policy can do is level the playing field so that all regions have the opportunity to compete within the appropriate bracket.

Figure 2 provides a matrix showing types of policy of support by position in the urban hierarchy. The structure reflects differences in opportunities, capabilities and needs across the five ranks in the regional hierarchy. Public support for regional policy is more effective if can provide the type of resources that are the most

important in removing bottlenecks in particular regions. Because the members within a specific rank have relatively similar socio-economic and geographic attributes, it is possible to identify specific types of policy that match these characteristics. For example, in very large regions where there is a dominant center, it has both an interest, and the capacity, to organize regional development efforts. And, in the very smallest Third Order Rural regions where there are only isolated communities there is little point in trying to organize collective regional economic development approaches. But in the middle ground where no single community is dominant and there are multiple settlements in the region, then it becomes important to put policies in place that support collective action, such as Community Futures.

Some forms of support apply to all regions while others are restricted to a single rank in the hierarchy. The intent is to provide policy support that is tailored to the types of problem and opportunity most common in each level of the hierarchy. Clearly these are somewhat generic policies, but within a category each region can pick specific elements that are most useful to it. The types of support are indicative and not necessarily the best sets for each rank. They are intended to provide a starting point for developing actual packages of support based on the idea that regional development policy has to work at the level of specific regions but see these regions within a larger context that places them in an urban hierarchy.

About The Work

This report is the product of almost three years of research carried out at the Leslie Harris Centre of Regional Policy and Development at Memorial University. Funding for the work came from the Harris Centre and the Atlantic Canada Opportunities Agency through a contribution under their APRI program. The research builds upon an earlier project conducted at the Harris Centre by the same research team that focused on identifying local labour markets in Newfoundland and Labrador. This previous project provided much of the conceptual framework for identifying local labour markets as functional economic regions and for using them as a geographic unit to enhance local economic development.

The main objectives of the project were to:

- extend the methodology across all four provinces in Atlantic Canada;
- identify a way to group these local labour markets into a relatively small number of sets that could be used for identifying policy interventions and for peer learning among the members;
- examine the characteristics of various regions to help identify factors that account for higher and lower rates of economic growth; and
- provide national and provincial policy makers with a better understanding of the underlying characteristics of regional economies in Atlantic Canada.

The research team relied on the guidance of an Advisory Committee that was made up of ACOA personnel involved in economic development programs and policies and

senior officials from the four provincial governments, each of whom was involved in framing and managing provincial economic development efforts. Members of the committee are identified at the end of the Executive Summary. The Advisory Committee met several times each year and provided important feedback on the ongoing work.

Interim results from the project have been presented to academic audiences and to regional stakeholder meetings in several of the provinces. The academic meetings provided a test of the validity of the methodology, while regional stakeholder meetings provided a way to see if the research results could be communicated clearly and whether they resonated with the people on the ground in communities who are involved in actually trying to improve their local economy. In both instances we believe that we were successful and this gives us confidence in the value of the work.

Members of the Advisory Committee:

A joint federal-provincial advisory committee was established to support the research. This Committee provided important input to the research team on conditions in the various provinces and served as a sounding board for earlier drafts of the reports. In particular, the Committee helped us improve our explanations of the research and suggested important contexts for making the results more policy relevant. It is important, however, to be clear that the analysis, results and conclusions in the report are the work of the research team and should not be construed as reflecting the opinions or policies of the individuals on the advisory committee, nor their respective federal or provincial agencies.

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Funmi Joseph – Federal co-chair (ACOA Nova Scotia)

The research team also would like to acknowledge support from ACOA in facilitating the meetings with the advisory committee and in helping with a variety of project coordination and management issues. Once again nothing in the report should be construed as reflecting the opinions or policies of either the individuals whose help we acknowledge, or ACOA.

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Figure 2: Matrix of Hypothetical Policy Suites By Functional Economic Region Category

Type of Place	Larger Urban	Regional town - high productivity, stable or increasing population	Regional town - low productivity, decliningpopulation	Rural 1- high productivity, stable or increasing population	Rural 1- low productivity, stable or declining population	Rural 2 - high productivity, stable or declining population	Rural 2 -low productivity, declining population	Rural 3 - single CSD or 2 CSDs
Synopsis of conditions	Good to fair economic conditions, largely competitive and with stable to growing populations, presence of major public infrastructure	Places that are experiencing stable economic activity or modest growth. Often in a larger region that is economically prosperous	Towns that have weak economic functions. Main role may be a regional service center in a declining larger region.	small specialized economies with strong export industry. economy viability depends on maintaining or expanding this export base	small specialized economies with weak export industry. Current export base needs revitalization or replacement	highly trusted economies, but with one firm that is competitive by Atlantic Canada standards. Firm may be replacing workers with capital to remain viable	highly truncated economies, but with weak export potential. in clear danger of disappearing	very small places, low populations, some have a viable firm/sector, but most do not. Very few opportunities for growth and these depend on individual firms. Little , if any, local capacity to lead development
Number of Regions	13	5	24	5	26	9	30	149
Main Policy Objectives	Strengthen local economy by improving economic performance. Support regional innovation systems where possible. Support workforce skill development. Encourage agglomeration effects to support endogenous growth	Expand spatial reach of central place by improving connectivity. Support supply chain developmetn. Tailored workforce skills. Support for new firms and new products/processes. Support for entrepreneurs.	Help identify new activities that can improve competitiveness. Strong business retention and expansionactivity. Support for filling well defined infrastructure gaps. If necessary help in downsizing to a smaller size/function. Support for entrepreneurs.	Support for leading firms to increse productivity. Add supply chain links where possible. Identify new opportunities, but being careful not to harm existing firms. Support for entrepreneurs.	Try to revitalize leading firm and/or search for new opportunity. Limited subsidies for existing firm may be needed. Search for new administrative or public service delivery functions. Support for entrepreneurs.	Try to match labor supply to firm needs, but support replacement of labor with capital if this maintains productivity. Help firm with marketing and technical knowledge. Support for entrepreneurs.	Try to provide basic services for communities but with low facility investments (mobile services). Support for outmigration of residents. Support for social enterprise. Support for entrepreneurs	Provide support for individual firms, encourage volunteers, provide support for outmigration, ensure access to basic services but without investing in local facilities
Support Regional Innovation Systems	X							
Cluster promotion	X	X						
Firm Based Innovation		X	X	X	X	X	X	
Support Entrepreneurs	X	X	X	X	X	X	X	X
Broad Workforce Training Schemes	X	X						
Community Futures				X	X	X	X	
Tailored Training Schemes		X	X	X	X	X		
Business Retentions & Expansion		X	X	X	X	X		
Strengthen Supply Chain Links	X	X	X	X				
Road Improvements			X	X	X			
Broadband					X	X		X
Incentives for local government collaboration				X	X	X		
Mobile Service Delivery						X	X	
Wage Subsidies (seasonal Et etc.)						X	X	X
Labor market matching efforts			X	X	X	X		
Support for Outmigration						X	X	X
Support for firm specific investment		X	X	X				
Shared Public Services		X	X	X	X			X
Support for volunteers to provide services				X	X	X	X	X
Support for Social Enterprise				X	X	X	X	

Functional Regions as a Structure for Enhancing Economic Development in Atlantic Canada

In this report we describe a typology of functional regions for the four provinces of Atlantic Canada. The functional regions we use are based on commuting data provided by Statistics Canada so these particular functional regions can also be thought of as local labor markets. A key advantage of functional regions is that the region boundaries are defined on the basis of how people actually behave, rather than on administrative decisions about boundaries made by government agencies. The report provides a regional typology that reveals similarities and differences across the four provinces in terms of regional types. The analysis suggests that regions in Atlantic Canada with similar characteristics, irrespective of which province they are in, have more in common in terms of economic development opportunities and constraints than they do with other types of region in the same province.

The major conclusions from the analysis are:

1. There are 259 distinct local labor markets in Atlantic Canada. Each of these functional regions consists of a territory where the vast majority of the workers within the region live and work, although often not in the same community. The regions differ greatly in terms of population, economic activity and size. The largest region is focused on Halifax and is a medium size metropolitan region with over 400,000 inhabitants. The smallest regions are small, single Census Sub-Divisions with fewer than 600 residents and limited economic activity. While each region represents a local labor market, there is great diversity in: size of workforce, distribution of skills, participation rates and in the extent of seasonal employment.
2. While these regions are local labor markets, they also form natural units for organizing local development. Local development is mainly about improving levels of employment and income, making the local labor market the natural unit. In most regions there are multiple settlements organized as local governments. While each local government is autonomous and sets its own strategies, the reality is that most of these governments are jointly dependent, because they operate in a single local economy and their growth opportunities hinge on how their neighboring governments behave.
3. Within Atlantic Canada there is clear hierarchy of regions. Each region can be characterized as being within one of five categories that collectively form a regional/urban hierarchy¹. The hierarchy groups regions that have similar characteristics and opportunities into a single category

¹ The initial classification of the regions was computed using the 6 digit NAICs from the Statistics Canada December 2011 Business Registry database. For the purpose of displaying a region's industry mix the data are aggregated into 8 classes and in their NAICs order they are: [1] Primary Industries, [2] Construction, [3] First Stage Processing, [4] Secondary Manufacturing, [5] Retail Trade, [6] Non Government Services, [7] Transportation and [8] Government Services. Note that the NAIC numbers associated with the classification are listed in Appendix I.

or rank. In terms of economic development, regions within each category have more in common with other members of their category, regardless of province, than they do with adjacent regions in the same province that are in other categories.

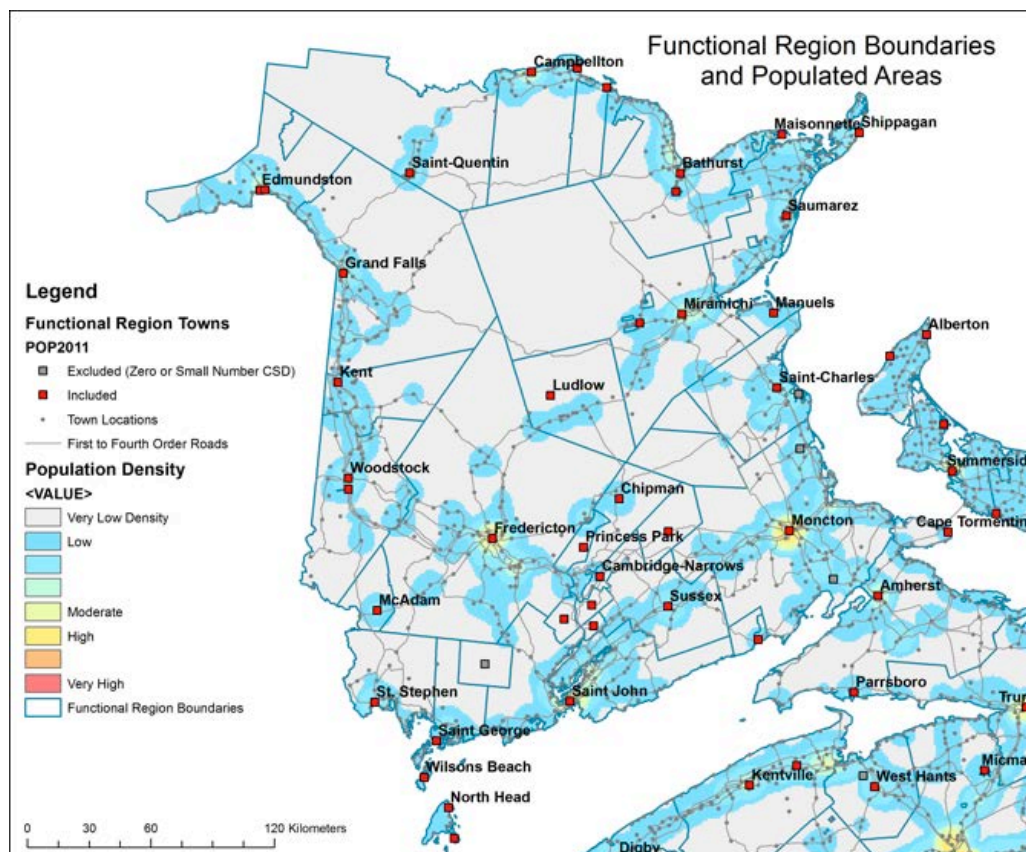
4. The top level of the hierarchy is made up of the 11 largest population regions in Atlantic Canada. These regions on average are the best performing part of Atlantic Canada in economic and demographic terms. They are mostly experiencing modest population and economic growth. The next level is made up of regions centered on smaller cities and regional towns. These regions also play an important role in Atlantic Canada in providing higher order goods and services to smaller regions far from the major urban centers. Typically they perform reasonably well, but at a lower level on average than the larger urban regions. Three categories of rural regions are defined. The three ranks are distinguished by population, which largely determines the size of the local economy, the size and capacity of local governments, and the range of goods and services available locally. Unlike the first two categories these rural regions have limited effect on other regions, because the range of goods and services they provide is not large enough to attract many people from outside the region. Rural regions are highly export oriented, with a major share of output leaving the region. If the output has high value, rural regions can be prosperous and productive in per capita terms, even though they are small. However, a large number of rural regions have low levels of GDP, low levels of productivity and declining economies.
5. Higher rank regions generally perform better on average than lower rank regions; however, there is such a high degree of diversity in performance within categories in the hierarchy, especially for the three categories of rural regions, that some rural regions perform better in economic measures than the largest urban centered regions. In particular, productivity can be very high in resource focused rural regions that produce valuable primary products for export outside their region.
6. This diversity in performance leads to a dynamic process where high performing regions in a category can grow enough to move up a level in the hierarchy, while low performing regions will lose population and economic activity will decline causing them to drop down in the hierarchy. Clearly regions in the top rank cannot grow upward, but some members of this group are at risk of dropping down a rank. Similarly, declining regions in the bottom rank, which is made up of very small regions, face the prospect that they will cease to exist in the future.
7. The OECD has long advocated a “bottom-up” development strategy that places a high burden on local leaders to drive their own economic development approach. In Atlantic Canada functional regions based on local labor markets are a natural unit for implementing this model. Moreover a bottom-up approach has been endorsed by multiple governments including, the European Union (LEADER), Germany (Regionen Aktiv) and Canada (Community Futures), as well as by the majority of the academics working on local development. Given the high degree of diversity of conditions and opportunities in the regions of Atlantic Canada, and within each of the provinces, adopting a bottom-up approach to economic development is crucial.
8. But given a bottom-up approach, what is the role of national and provincial governments? Government should provide a suite of policies that can support local economic development strategies. In smaller regions these policies would include helping create the capacity to develop and manage development strategy. While each region will face a unique situation federal and provincial governments can support regions by developing suites of policies that are appropriate for regions in a particular rank in the regional/urban hierarchy. This requires that governments identify five sets of programs, with each suite containing specific programs appropriate for that size of region. Specific programs may be appropriate for different ranks, but a significant share of the programs in each suite will be specific to regions of a particular size. Government programs should not pick winners and losers in this process, although there will be winning and losing regions. Instead government should provide support that levels the playing field for regions of the same rank, but recognizes that regions in different ranks are playing different games.

The Basic Typology

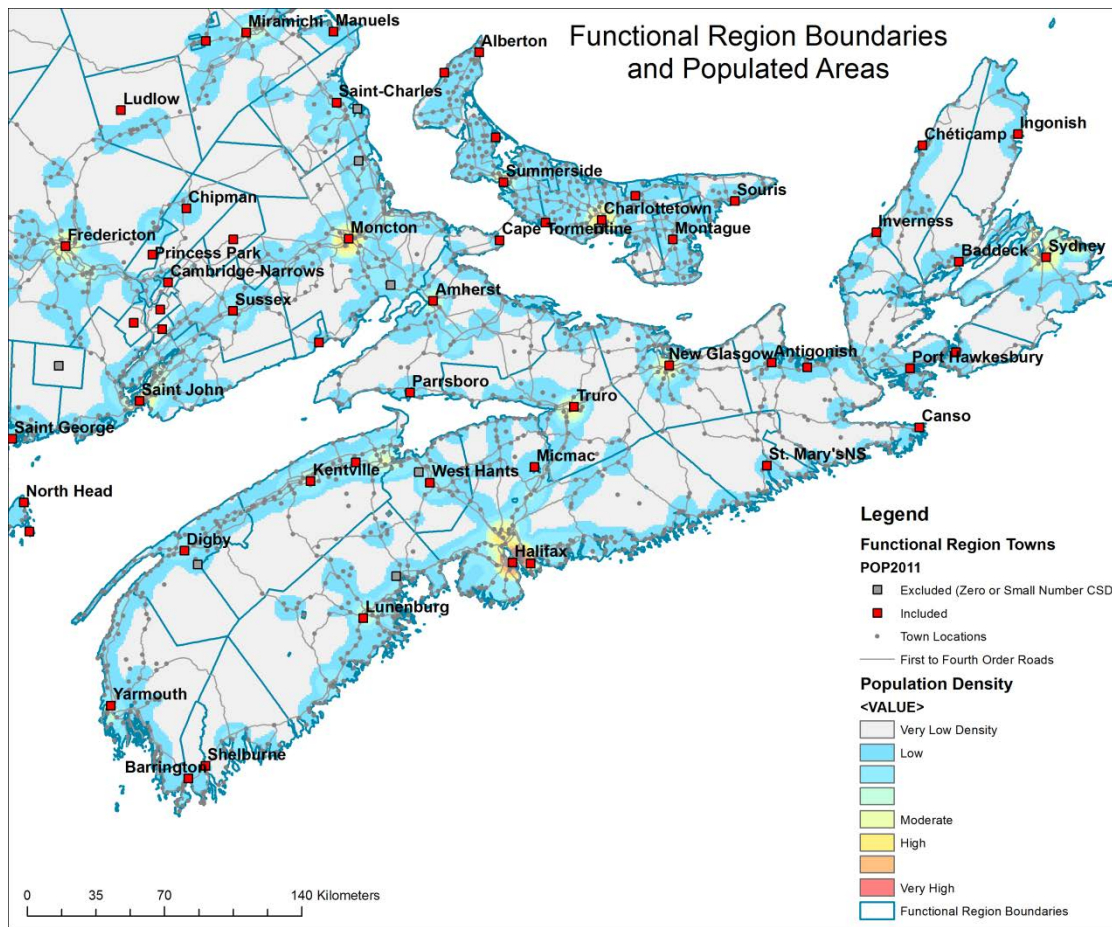
Individual responses related to commuting patterns collected in the census are aggregated by Census Sub-Division (CSD), which is the basic geographic unit used by Statistics Canada. Notably the set of CSDs covers the entire territory of each province. Because large portions of Newfoundland and Labrador and New Brunswick are uninhabited, the resulting regions suggest a more evenly distributed population than is the case. Constructed functional regions contain varying numbers of CSDs depending on: the underlying size of the populations and local economies, the geographic size of the subdivisions, and the degree of inter-CSD travel for employment. Some functional regions are large metropolitan regions with a dominant city and a complex hinterland. Other functional regions consist of one or two low population, remote CSDs with very small settlements, exhibiting a combination of very weak commuting flows and low levels of employment within these functional regions.

Maps 1a, 1b, 1c, 1d, 1e show the functional regions by province and identify the location of significant settlements. These maps also provide a sense of actual population densities. Economic activity is highly dependent upon population concentrations and the maps suggest that large areas of all provinces except Prince Edward Island remain relatively unsettled. The final point to be taken from the maps is the highly variable size of the functional regions. Notably the relationship between size of region and population roughly follows a U shape. Remote low population regions tend to be relatively large geographically because there are few, small settlements, with people forced to travel long distances for work. At the other extreme, metropolitan regions can also be quite large because of the attraction power of a large city as a source of high wage jobs. Note that there are obvious exceptions to this pattern.

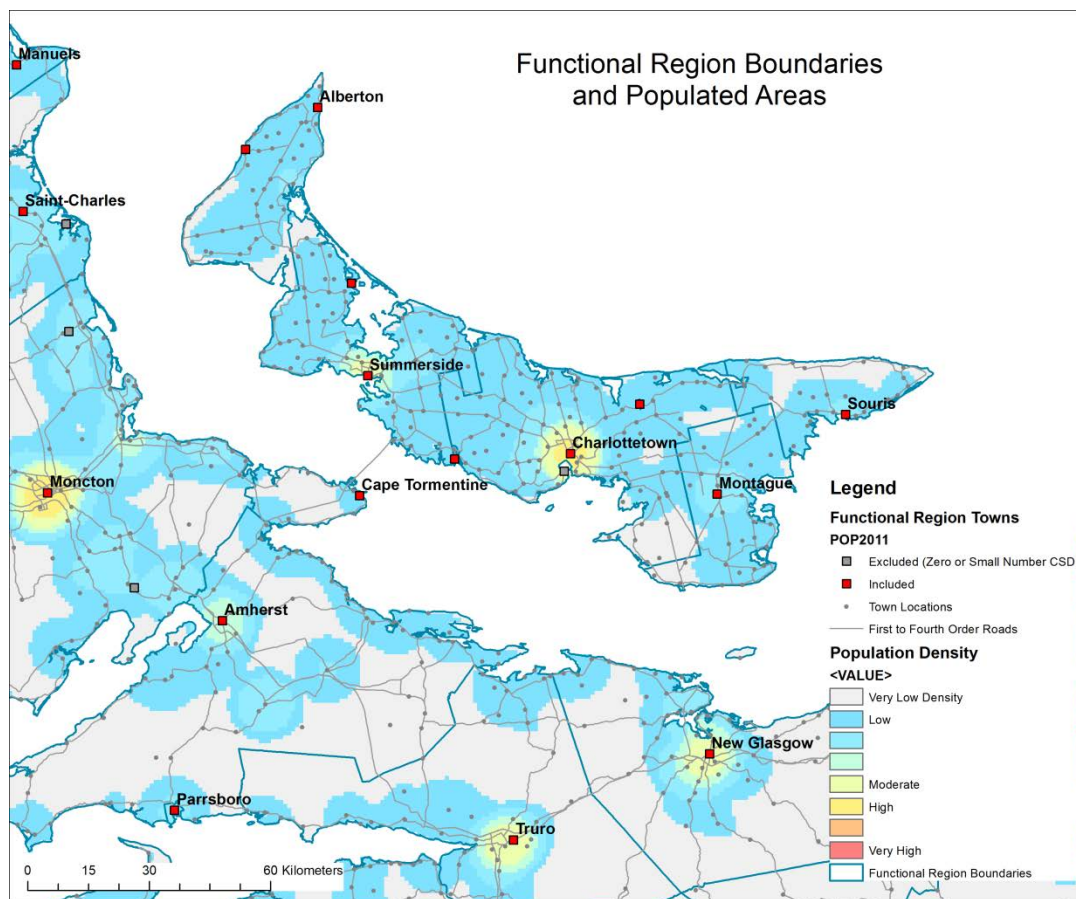
New Brunswick



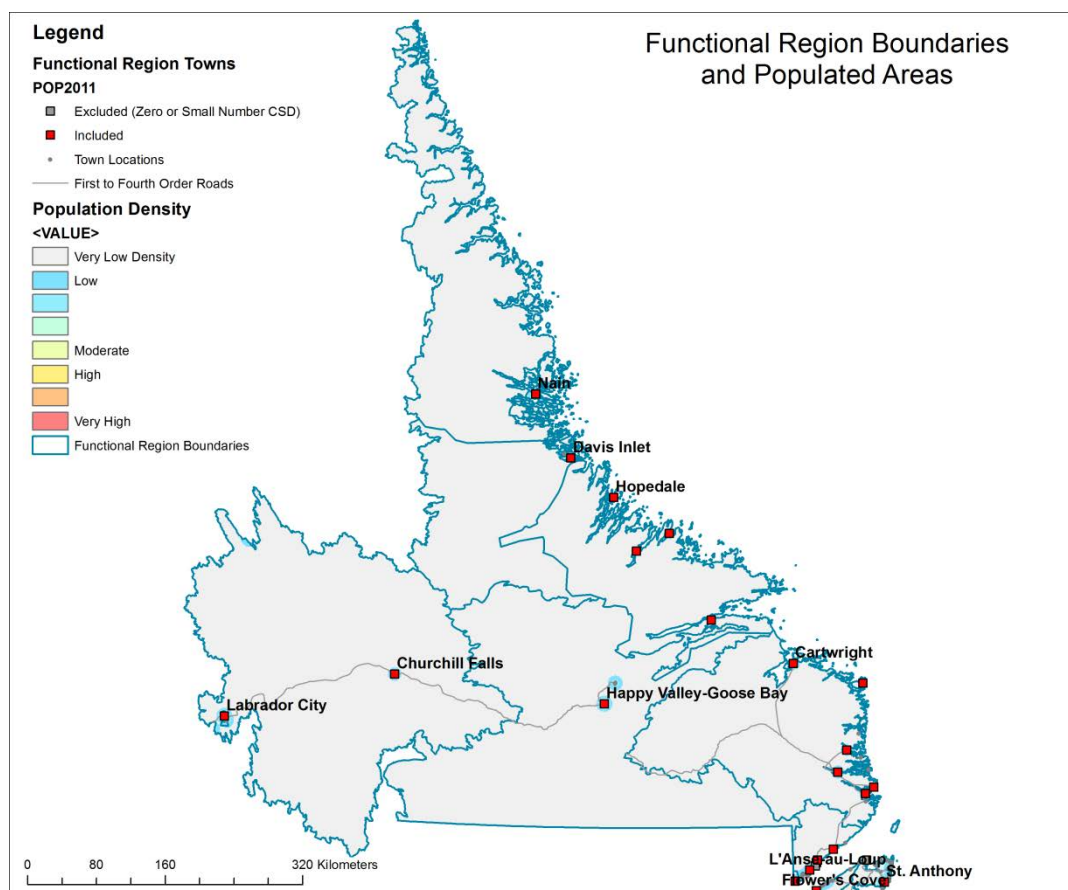
Map 1a New Brunswick Functional Region Boundaries and Populated Areas



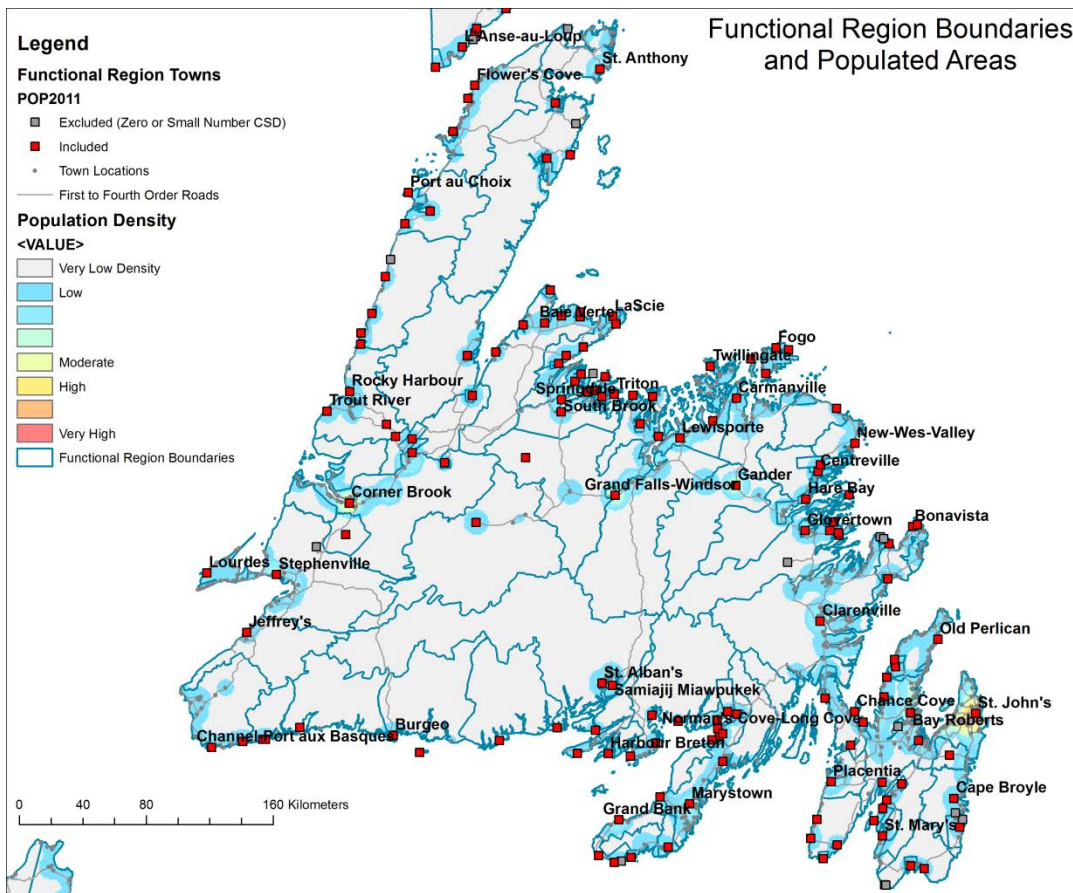
Map 1b Nova Scotia Functional Region Boundaries and Populated Areas



Map 1c Prince Edward Island Functional Region Boundaries and Populated Areas



Map 1d Labrador Functional Region Boundaries and Populated Areas



Map1e Newfoundland Island Functional Region Boundaries and Populated Areas

The Typology of Regions

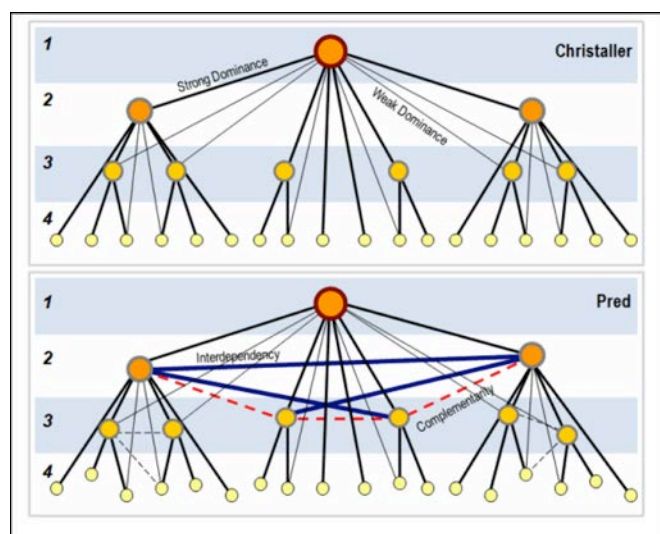
Five levels of regions are identified. The levels correspond to the standard urban hierarchy used in regional science and economic geography (See Box 1). The regional typology developed in this work essentially follows Christaller's approach with a rural territory linked to one or more urban places (Anderson, 2012 pp. 295-302; Berry and Garrison, 1958). The boundaries of each region are defined by labor flows so each region is a local labor market. We do not measure inter-regional flows but clearly the set of goods and services available in lower order regions requires that firms and households cross functional region boundaries to obtain higher order goods and services. In Atlantic Canada, external trade flows are more likely to resemble a blend of Christaller's approach and Pred's approaches. Halifax is clearly the dominant urban center, and many other larger urban places are far enough apart that they have no competition. However, for smaller urban centers there is considerable horizontal trade. This is especially true within a functional region where individual settlements may tend to specialize in economic function in order to achieve economies of scale.

Table 1 provides summary information on the five regional categories and additional information on the individual characteristics follows below. The table shows that the vast majority of local labour markets in Atlantic Canada are small. Only the largest category contains regions with populations in excess of 50,000, which is typically seen as the minimum size for a region to have any sort of endogenous growth potential. This suggests that while there are numerous distinct and fragmented local labour markets in Atlantic Canada these labour markets are interconnected through retail trade flows, supply chains for firms and service areas for government agencies. It is these interconnections that the hierarchy of regional categories captures.

Box: The Urban Hierarchy

The Urban Hierarchy is a basic concept in urban analysis that has its origins in the work of Christaller (1933) and Pred (1977) on central place theory. The original concept developed by Christaller identified a hierarchy made up of seven levels of urban places in southern Germany, each with an associated hinterland forming a region. Larger urban centers provided a greater variety of goods and services while the smallest centers provided only basic goods and services. Urban places in the lowest order regions serve only the local population in their region, while each higher level of region provides higher order goods and services both within its region and to other adjacent regions. Importantly, each higher order region provides all the goods and services of lower order regions plus additional goods and services the lower order regions do not provide. Essentially the hierarchy exists because as goods and services become more sophisticated they are purchased less frequently and by a smaller number of people and so a larger population is required to support their demand. Obviously the number of regions at each level of the hierarchy decreases as the size of the region increases.

Pred modified Christaller's analysis to allow horizontal linkages among cities instead of only the strict vertical relationships Christaller had defined. Pred recognized that variety was important and that what was produced at different urban centers at the same level in the hierarchy could be different enough that trade could occur across all levels of the hierarchy. Secondly, the rise of the multinational firm with branch plants and integrated supply chains also leads to trade outside Christaller's narrow hierarchy. The result is a more complex set of relationships where the largest urban places still matter the most, but they no longer have a captive set of lower level regions. The figure below captures the essential differences in the two concepts.



source: <http://people.hofstra.edu/geotrans/eng/ch2en/conc2en/urbanhierarchy.html>

While each region is an autonomous labor market, individual regions are connected through trade flows of goods and services. The two largest categories of regions contain what most people would consider to be cities, albeit mostly small cities. In these regions, the urban places are the dominant economic entities. However, the majority of functional regions fall into a "rural" category where individual settlements are

quite small and the main economic function remains coupled with the natural resource base. There are three distinct levels of rural region, with the smallest mainly comprising places that are largely outside the market economy and reliant upon transfer payments for their ongoing survival.

Figure 1: The Five Categories of Functional Region in Atlantic Canada

	Number of Regions	Average Population	Range In Size
Urban Centres	11	132,541	412,000 - 101,620
Small Cities & Regional Towns	29	22,237	39,805 - 9,225
First Order Rural	31	4,568	7,950 - 2,140
Second Order Rural	39	1,055	2,139 - 1,810
Third Order Rural	149	236	600 -95

Urban Centres– There are 11 relatively large urban regions in Atlantic Canada. These regions, with populations ranging from 101,620 to 412,200, are based on Halifax NS, St. John’s, NL, Moncton NB, Saint John NB, Fredericton NB and Sydney NS (Cape Breton functional region). In addition, there are 5 other functional regions classified as urban because of their industrial and service diversity: Charlottetown PE, Kentville NS, Lunenburg NS, Truro NS, and New Glasgow NS. The population of these 5 smaller urbanized regions ranges from 45,645 to 77,150. By international standards these are all small metropolitan regions, but in the context of Atlantic Canada these are the largest urbanized places, with each providing higher order goods and services to surrounding regions.

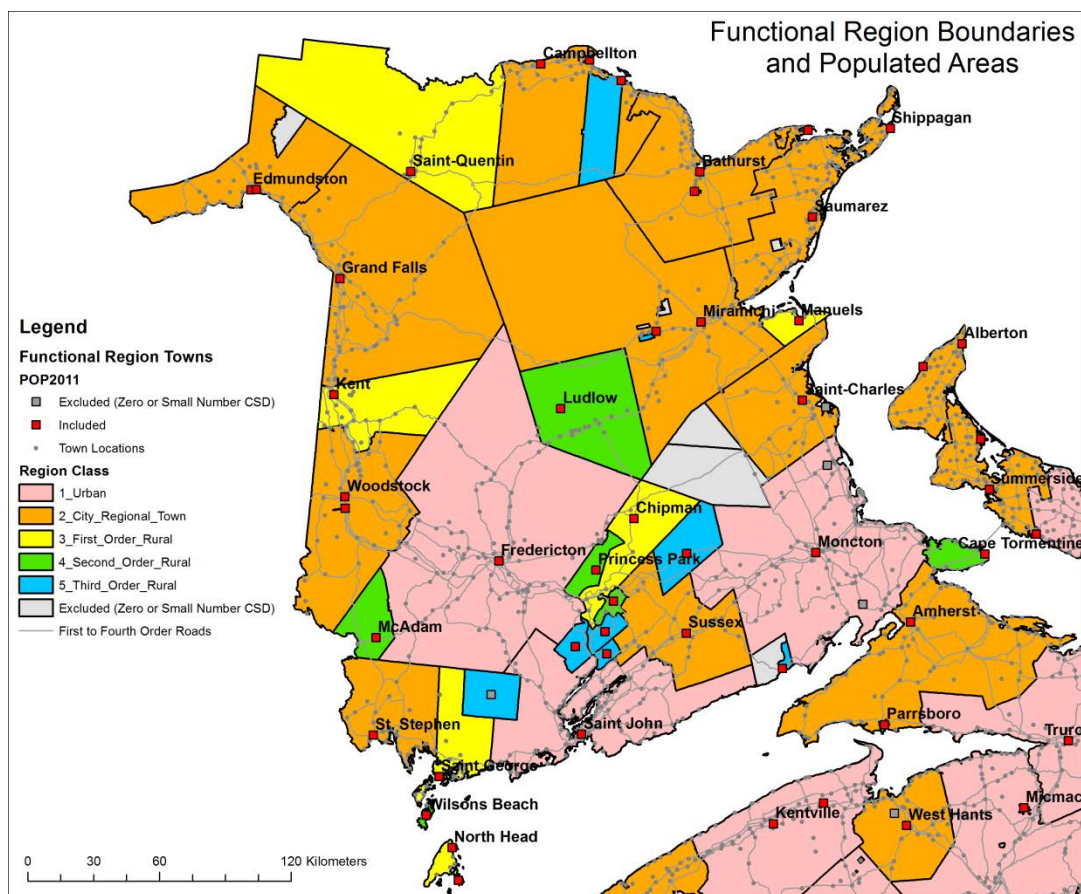
Small Cities and Regional Towns - There are 29 functional regions classified as small cities and regional towns with regional populations ranging from 9,225 to 39,805. These regions are characterized by having at least one reasonably sized town that is a focal point for public services and higher order retail for its region and for adjacent smaller regions. Some of the regions in this category are quite distant from one of the urban centre regions and have a significant spatial reach into other smaller regions. Other members of this group are relatively close to a larger region that dominates the broader territory. In this latter case their opportunities for growth hinge on what happens in the larger urban centre. If it grows they are weakened, but if it declines they may have the opportunity to capture additional markets.

Rural 1 – There are 31 first order rural regions in Atlantic Canada. These regions have populations ranging from 2,140 to 7,950 , and contain communities having populations from 27 to 6,994 people distributed across an otherwise sparsely populated countryside. They are the small service centres for retail and government services for their own residents and some surrounding regions and have the most diversified economies of the rural categories.

Rural 2- There are 39 second order rural regions in Atlantic Canada. The population of these functional regions ranges from 1,810 to 2,140. In many cases these are single industry towns, and often employment is dominated by a single firm. Again, these regions are sparsely populated with limited connectivity between communities. People have to leave their region to obtain all but the most basic retail goods and most public services. The population range of individual communities in this type of region is between 27 and 528 people.

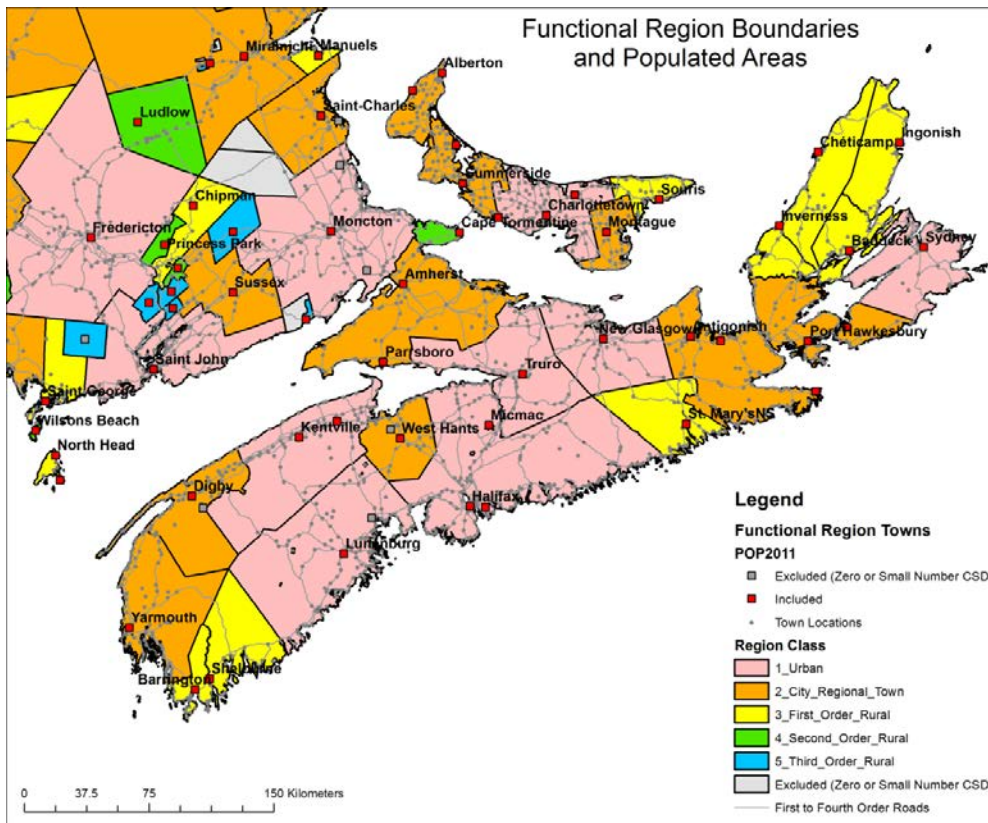
Rural 3 – There are 149 third order small rural regions in Atlantic Canada². These regions are comprised of either one or two CSDs. They have total regional populations of less than 600 with settlement sizes ranging from 15 to 583, and very weak economic activity. A majority of these regions are remote, but there are single CSDs that are relatively close to higher order regions, but are outside the local labor market of the larger region. Residents in these regions travel to other regions to obtain virtually all goods and services because very little is available locally. These regions have the highest variability in condition. Some have a small but relatively productive local economy while others have almost no earned income from the private sector. Some face imminent extinction because they are dominated by people too old to work, while others have a growing population. In all these regions, a common element is the lack of critical mass to assemble a strong local economy.

Maps 2a, 2b, 2c, 2d, 2e show the distribution of regional types by province. Nova Scotia and Prince Edward Island have no Second or Third Order Rural Regions, while these two types are common in Newfoundland and Labrador. These maps also show the major road network in each province, and road density is clearly higher as the degree of urbanization and population size of regions increases.

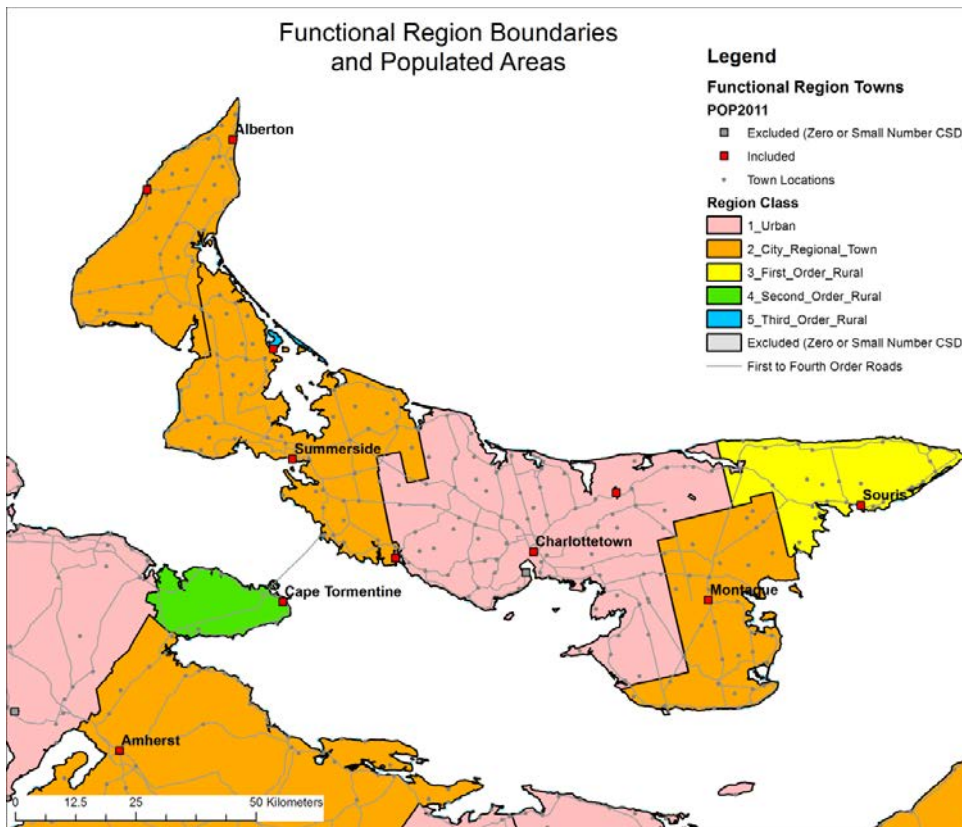


Map2a New Brunswick Functional Region Class

² Note that 38 CSDs have populations of zero or less than 10 people and are not included in the analysis.

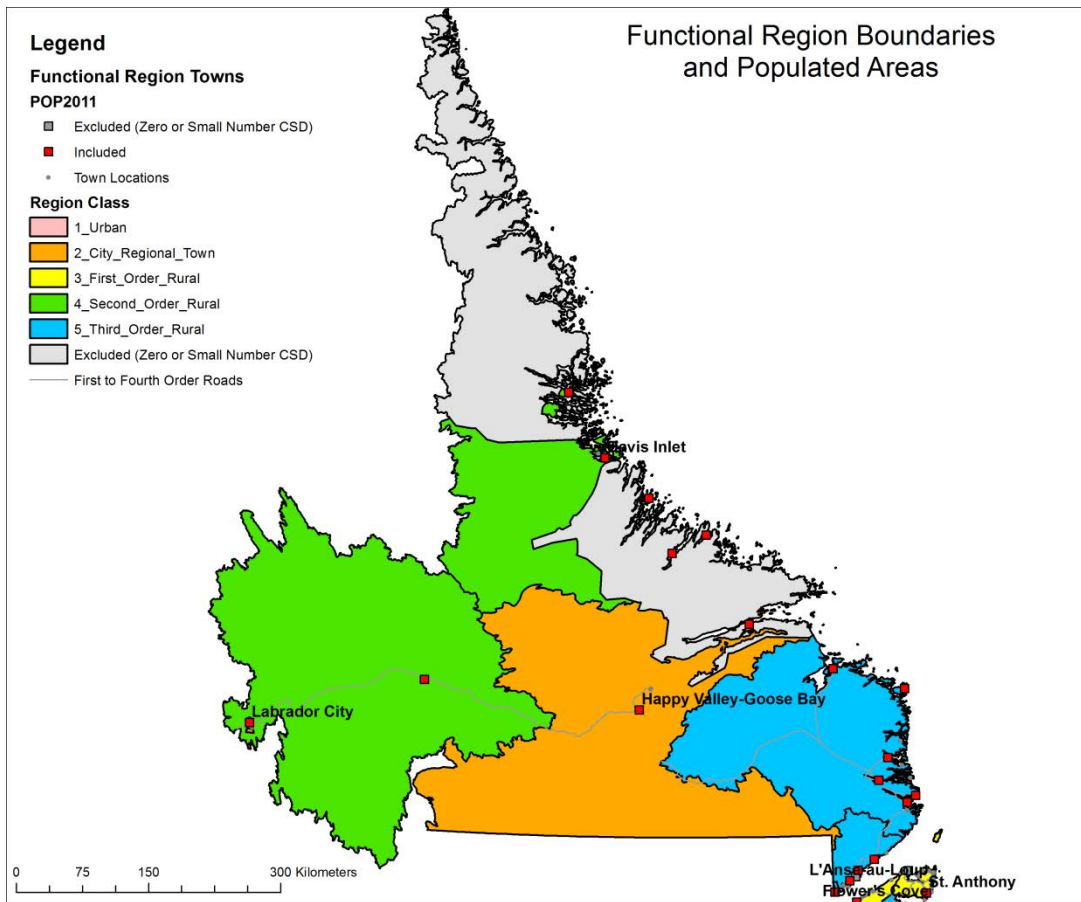


Map2b Nova Scotia Functional Region Class

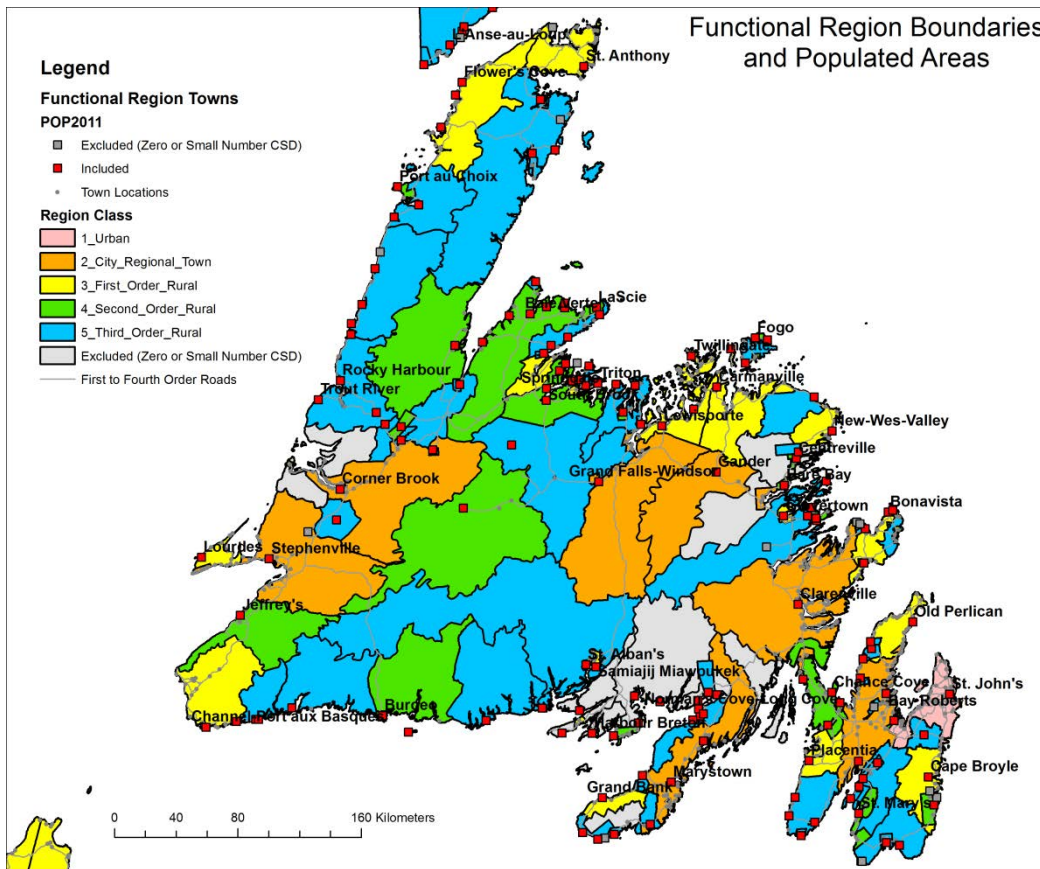


Map2c Prince Edward Island

Functional Region Class



Map 2d Labrador Functional Region Class (Note Labrador City is classed as city regional town)



Map 2e Newfoundland Island Functional Region Class

Augmenting the Basic Regional Typology

Given these five regional types, the main objective of the analysis is to provide additional information on the characteristics of the five categories that can help guide development strategies both for stakeholders within each functional region, and for policy formation by the provincial and federal governments. Moreover, there is a significant degree of variability within each regional type, although for most indicators internal variability within categories is generally smaller than variability among the various categories of region. This suggests that although policy can be broadly framed by size of region using the five categories, there is enough variability within each of the categories to require nuances that recognize these secondary differences.

As a next step, three secondary dimensions, or axes, are introduced into the analysis:

1. *Population Change Ratio*, which captures how the population of a region has evolved between 2006 and 2011. A falling population suggests a shrinking workforce and lower future economic activity. We also examine how the age structure of the population is changing to see the impact on the potential work force.
2. *Education Diversity Index*, which provides a measure of the mix of different levels of educational attainment in the region relative to Halifax, the region with the greatest educational diversity. Regions that have a good mix of higher and lower education levels in their population can engage in a broader variety of occupations which allows more possibilities for increasing productivity,

greater opportunities for growth and more balanced growth. The index ranges from 0 to 1 where 0 is low diversity and 1 is maximum diversity.

3. *Proximity Score*, measuring the distance of that region from a region that is higher in the typology. The proximity score is a function of distance and the regional hierarchy. Thus, all functional regions classed as Urban will have a proximity score ranging from 7 to 5, where the largest center, the Halifax region, has the maximum score. High scores are associated with being near a large urban region, while mid-range scores are associated with being near a region in the middle of the hierarchy. Proximity is a mixed blessing since it allows access to goods and services not available locally, but it may preclude those goods and services ever becoming available locally. This is a continuous variable that ranges from 1 to 7 with road distance from a higher order region's centre affecting the score.

The three measures have limited correlation with each other and while there is a tendency for members of the same size category to score relatively close to each other, this tendency declines rapidly as we move down the urban hierarchy from urban centre to Rural 3. Below, we examine how the five levels of regional type score across the three variables. Box 2 provides a basic guide to interpreting box and whisker plots. Visual inspection of the various figures shown below suggests that there are significant differences among the five types of region. This is confirmed with statistical tests to see if the medians of the three measures are in fact distinct, with results shown in Table 1.

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The medians of Proximity Score are the same across categories of Functional Region Classification.	Independent-Samples Median Test	.000	Reject the null hypothesis.
2	The medians of Population Change Ratio 2006 - 2011 are the same across categories of Functional Region Classification.	Independent-Samples Median Test	.000	Reject the null hypothesis.
3	The medians of Education Diversity Index are the same across categories of Functional Region Classification.	Independent-Samples Median Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 1: Results of difference of medians test for proximity, population change and education diversity

Population Change: Overall Atlantic Canada is experiencing a significant aging and shrinking of its population which is projected to continue into the future. A few regions are experiencing demographic increase, others are essentially stable, while a significant number are experiencing a rather rapid aging of their workforce and large percentage declines in population. This trend will have a great impact on the size of the labour force. It effectively means that, for Atlantic Canada, economic growth cannot come from expanding employment, but will have to come from improvements in worker productivity. Only in the set of the largest urban regions is there average population growth. However, population decline is not uniform across all functional regions (Figure 1a). The greatest variability in growth and decline occurs in the rural regions, where the change ratio ranges from -0.79 to 0.56. The high growth in some lower order rural regions can be attributed to large development projects, such as in Long Harbour NL, where the population has almost doubled during the construction phase of the nickel-processing project. On the

other hand, some of the rural regions experienced such rapid percentage declines in population, from an already low base, that they face imminent collapse.

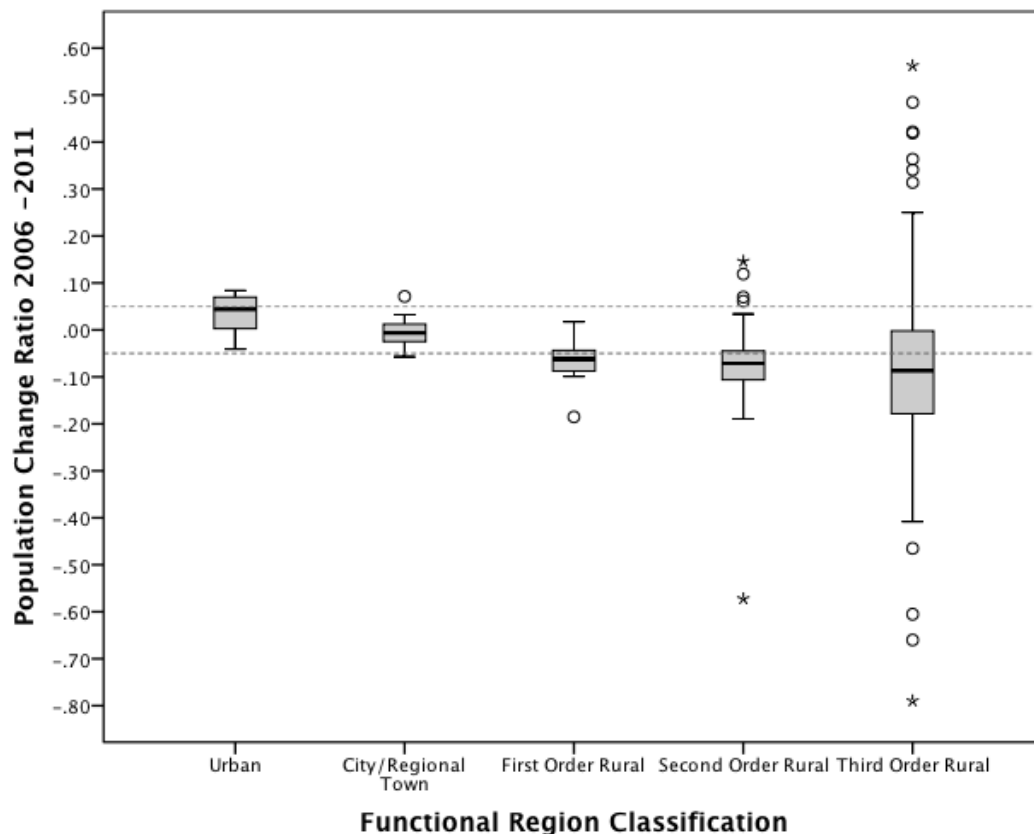


Figure 1a: Population Change Ratio 2006 – 2011 by Functional Region Type

BOX 2: Interpreting Box and Whisker Plots

These plots summarize the distribution of a data set. The box is centered on the median (middle) value of the data. The upper and lower bounds of the box are the first and third quartiles (50% of the data points are in the box). The lines extending from the box (whiskers) show how the upper and lower 25% of the data are distributed. The end of the whisker is determined by multiplying 1.5 times the inter quartile range (the difference between the value that defines the top of the box and the value defining the bottom of the box). These two bounds roughly correspond to the range where we would expect all the data to lie in a “well-behaved” distribution. Any additional extreme points shown beyond these two values indicate that the data is characterized by unusually large outliers.

Age Structure: In terms of the age structure of the workforce, the larger metropolitan regions have the best demographic performance as a group, while the other four categories show far more variability in demographic conditions, particularly in the smallest rural regions. Figure 1b shows the various age cohorts by category of region. It indicates that the labour force is ageing in all regions, but more rapidly in the rural areas. These areas also have the highest degree of variability amongst the cohorts. Only in the Urban Centre category do we see a strong representation of younger workers, while in the most rural regions, older age cohorts are dominant. This confirms that not only is the population shrinking across most regions of Atlantic Canada, but that the workforce is shrinking faster as the average age increases.

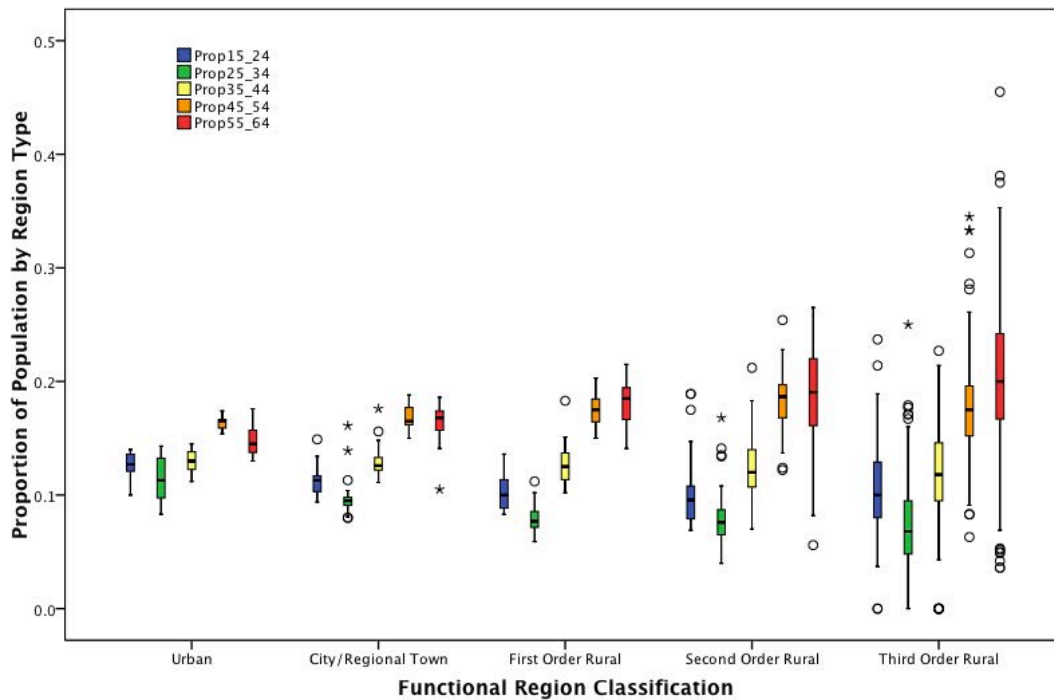


Figure 1b Labour Market Demographics by Functional Region Type

Educational Diversity: The Educational Diversity index measures how well balanced the region's workforce is in terms of having people with a variety of levels of educational attainment. It is increasingly clear that in the industrialized nations, economic growth is closely associated with improvements in human capital. To offset the challenge of competition from lower wage developing countries, industrialized countries must increase worker productivity to offset higher cost labour. In Atlantic Canada, the challenge of increasing labour productivity is especially important because of the shrinking workforce. While productivity can be increased in multiple ways, almost all of them hinge on the presence of a well-qualified workforce. It is increasingly important that regions are able to provide a mix of skills, so more than a high share of university graduates is needed. (Figure 1c). Across the functional region types, the lowest education diversity scores are in the most rural regions.

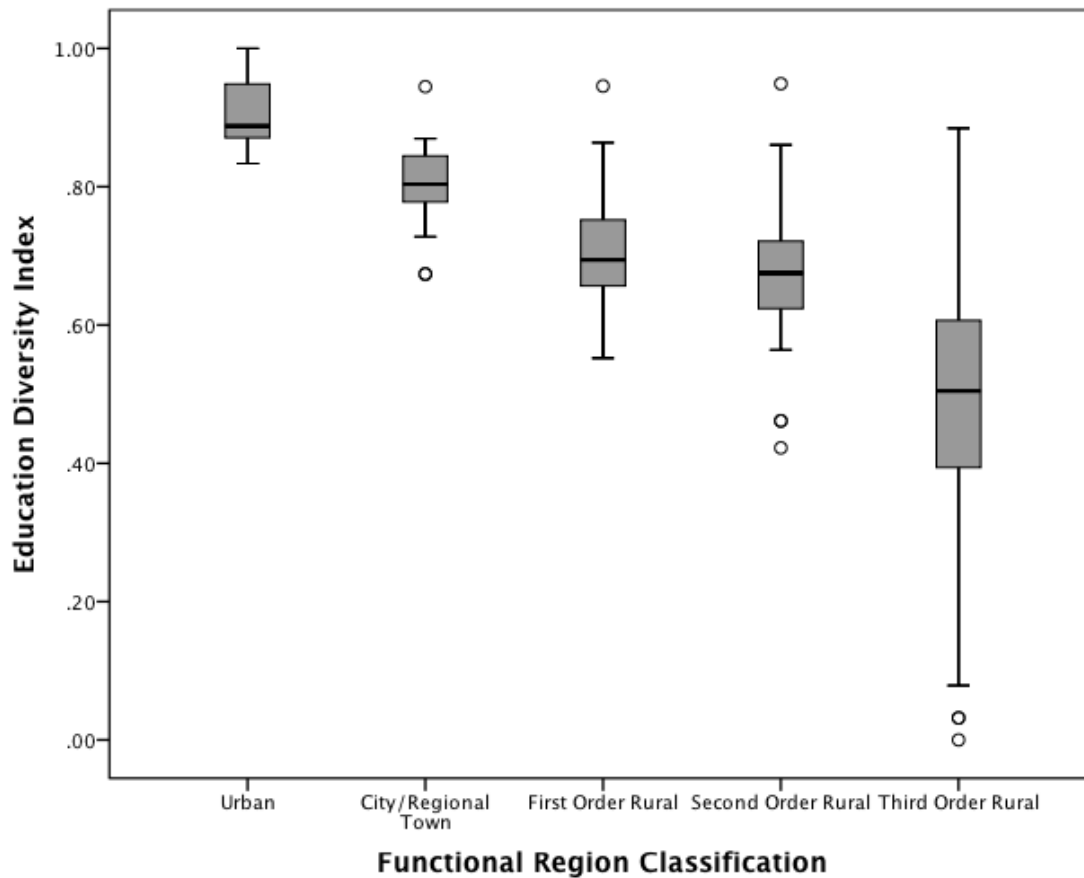


Figure 1c Education Diversity by Functional Region Type

Proximity: The proximity dimension measures how close each functional region is to a region with a larger population. By this measure, the largest urban regions have the highest scores. Currently, each functional region is defined as a self-contained local labour market, because commuting flows are strong within the region and weak outside the region. However, this may not hold in the future. In particular, proximity to a larger place offers the potential for stronger future commuting flows across the current boundary and potential integration into a single geographically larger region (Figure 1d). For proximity scores, the minimum for the Urban class is 5, while the Third Order Rural ranges from 1 to 7. This indicates that these rural places can be remote or urban adjacent. The median proximity scores for both second and third order rural is 2.00, suggesting that half of these region types are not urban adjacent and therefore have local economies that are dependent on local resources or government services.

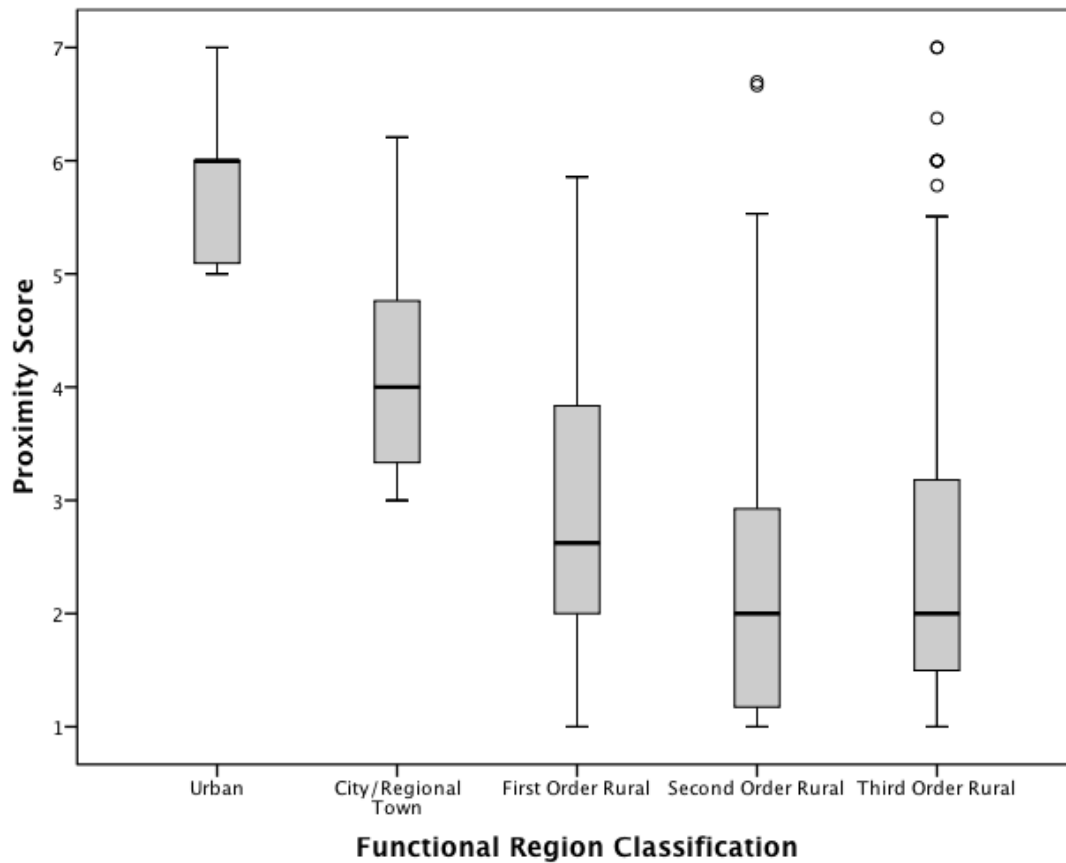


Figure 1d Proximity Score (1 = Remote and 7 = Urban Adjacent) by Functional Region Type

Figure 2 provides an overview of how the three key attributes vary across the 259 functional regions of Atlantic Canada. It clearly shows the segmentation among the five types of region. In general one can interpret the figure as showing regions that perform better being further away from the origin which is the back intersection of the three axes. For example, in the Figure 2, the red squares that represent the 11 urban centres are, as a group, furthest away from the origin, because they perform best on all three measures. The other key observation is that the degree of clustering decreases rapidly as the size of the category declines. Urban Centers are tightly clustered, while Third Order Rural regions are widely dispersed. The high degree of dispersion of the rural regions makes it clear that policy for these regions has to have sufficient flexibility to deal with a large range of conditions and opportunities.

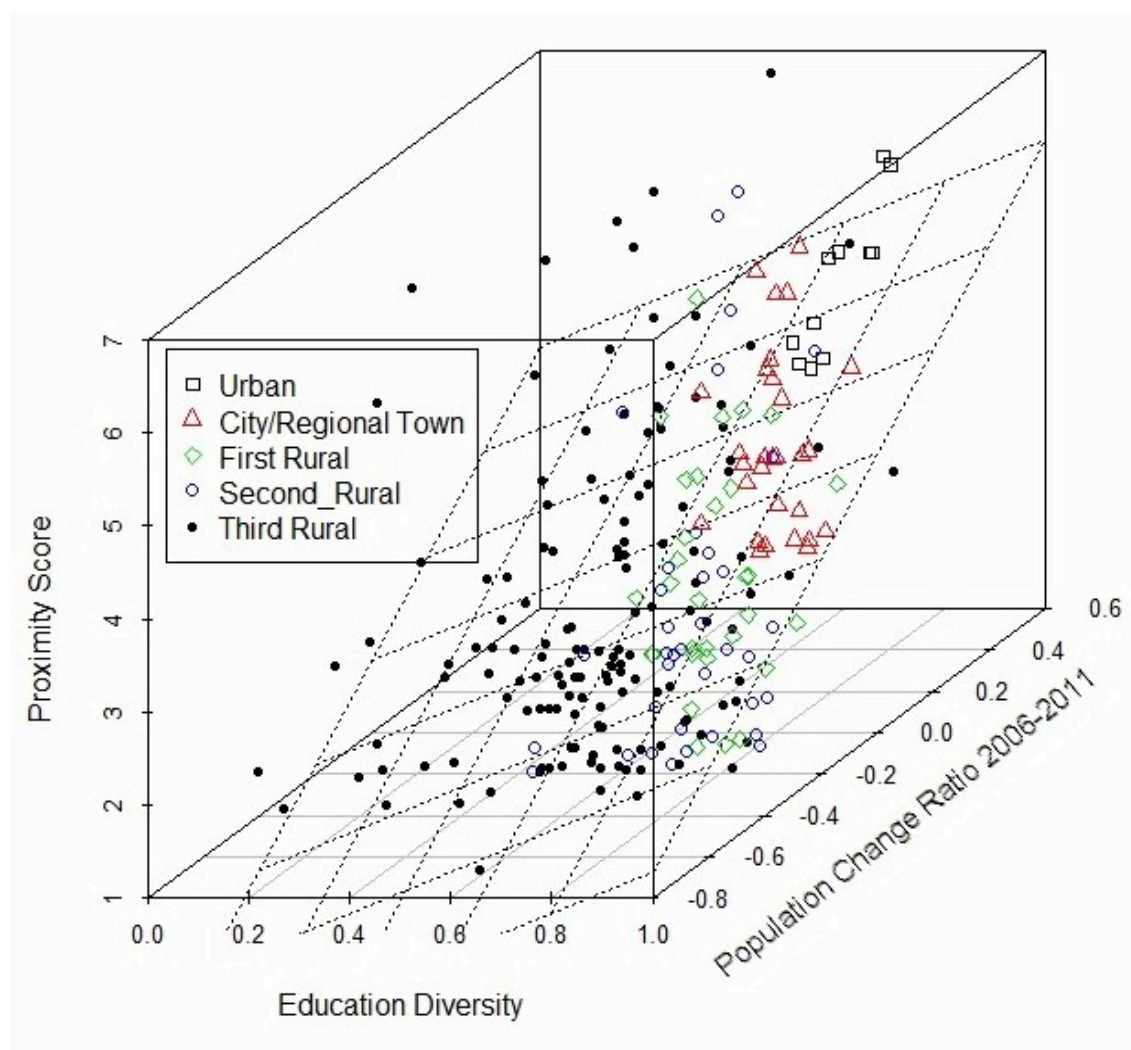


Figure 2: Functional Regions by Proximity, Educational Diversity and Population Change

Figure 2 provides a visual demonstration that conditions in Atlantic Canada cannot be simply explained by size of regions. Certainly the largest regions perform better on average, but some very rural small regions also have comparable performance. This reinforces the basic OECD message that economic growth can occur in any size region, and that it is important to understand the factors that enhance and limit growth in different size regions. While local labor markets are a useful way to identify a coherent geography for improving economic growth, the logic of the urban hierarchy, as developed by Christaller and Pred, makes it clear that growth and economic function have to be understood in a larger context than a single functional region.

The Analytics of Consistency and Divergence within the Regional Typology

In this section we examine the underlying socio-economic structure of the functional regions in greater detail. This detail will provide the basis for identifying policy options for federal and provincial governments, and for showing how stakeholders in specific functional regions can identify peers that are both their closest competitors, and that offer the best models for understanding their current position and future opportunities. While each region is unique in terms of its geographic location and current conditions, there is considerable value in identifying common themes for groups of regions. In some cases these can correspond to the five levels of the typology, but in other cases there are enough differences within a category that a smaller number of regions can be identified as a meaningful subset.

The starting point for the analysis is the examination of productivity at the functional region levels and the factors that influence it. Several years ago Paul Krugman famously wrote:

Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

Krugman, 1990

While Krugman writes of nations, his point is even more important for regions because regions are in competition with each other and higher productivity conveys a competitive advantage, as well as raising the local standard of living. Within each level of the hierarchy there are regions that perform better than others. While we present the hierarchy as a snapshot at a point in time the dynamics of a specific region's place can lead to a shift in where it fits in the distribution. If a region loses part of its market it will decline and eventually move from one level in the hierarchy to the next level down. Similarly, regions that are high performers can be expected to grow over time, and this growth will result in them taking on additional functions that can lead to moving up in the hierarchy of regions. While it is conceptually possible for all regions to grow, the fact that some regions will grow at a faster rate than others is sufficient by itself to alter the distribution in the hierarchy.

Productivity is difficult to measure at the regional level, especially for small regions where the local economy is idiosyncratic and small changes in employment and output can significantly alter productivity. In addition, the preferred measure of productivity - value added per hour worked - is not available at this level of spatial disaggregation. Instead we employ two measures, the first is GDP per worker and the second is total employment income divided by total workforce employed. The first measure is in some sense an upper bound on productivity because it is a ratio of output per worker uncorrected for the fact that only part of the value of output can be attributed to labor. The second measure is an average wage and can be thought of as a lower bound on productivity because while the maximum wage a worker can earn is determined by the marginal revenue product of the last unit of labor employed there is no necessity that workers be paid at this rate. Imperfections in the labor market can easily lead to workers earning less than this amount. And, supposing workers are paid the same wage the first workers hired inevitably earn less than their Marginal Revenue Product.

From Figure 3³, we see that average productivity declines as the size of the regions declines and that the median values for rural regions is somewhat less than for the two more urbanized regions. But the highest levels of GDP per worker are found in the two smallest region types, as are the lowest levels. This suggests that, while on average productivity is larger in more urban regions and variability in productivity is fairly small, small rural regions can have very high levels of productivity that considerably exceed those of urban regions.

³ In this figure 100 represents the average GDP per worker for Atlantic Canada.

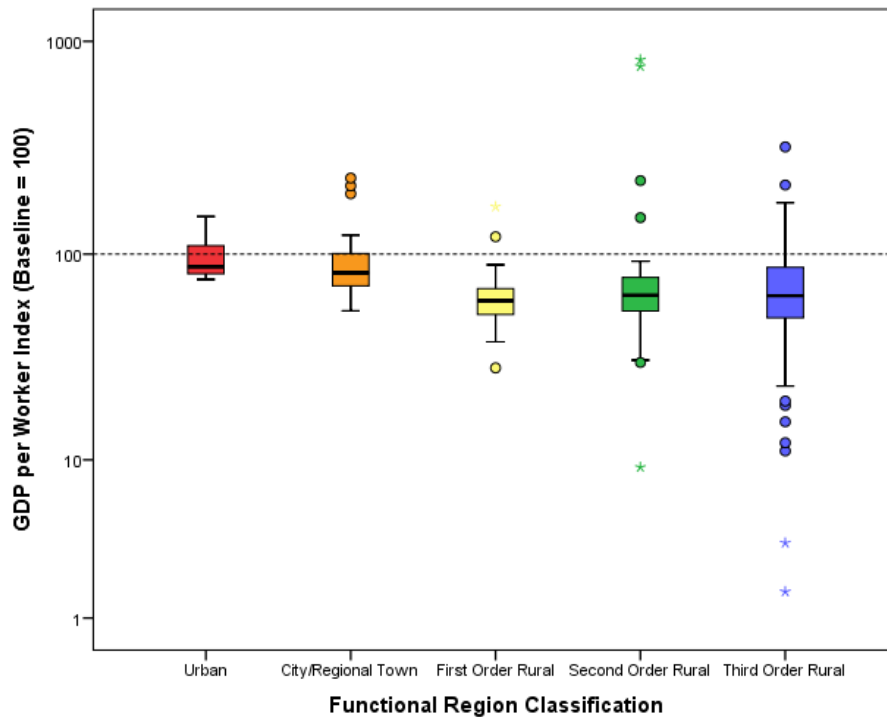


Figure 3: Atlantic Canada GDP per Worker Index by Functional Region

In urban regions GDP per worker is highest in the four provincial capitals, with noncapital urban regions having GDP per capita falling in the \$60,000 to \$80,000 range. Average GDP per capita remains in this range for the small city and regional town category but there is far more diversity. Bathurst NB, Clarenville NL and Labrador City NL have remarkably high levels of GDP per capita. Conversely, Saumarez NB, St. Charles NB and Shipagan NB have GDP per worker at or under \$50,000. First Order Rural regions have GDP per worker levels that are about \$50,000 on average but with even greater diversity. Second Order Rural regions have GDP per worker levels that average somewhat under \$50,000, but with very high values for Buchans NL and Churchill Falls NL. Both of these regions are highly specialized, with mining and electricity production, and with very small workforces producing valuable commodity outputs. Looking at Third Order Rural Regions we see that for those regions close to large urban regions the level of GDP per worker is bimodal. Some have levels comparable to the nearby urban region while others are very low. Many of the low levels are associated with First Nation Reserves, which have weak attachment to nearby labor markets. Many of the Third Order Regions near mid-size regions have GDP per worker levels that are either similar to, or higher than, those for First Order Rural or City and Market Town regions. Finally the majority of the most remote Third Order Regions have GDP per worker levels around \$50,000, but with some considerably higher than this.

The analysis suggests that on average, productivity, as measured by GDP per capita, does not vary a lot by category of region. While there is a clear benefit in being a provincial capital, this is not an option that is available to all regions. Notably, the number of smaller regions with GDP per worker well above the mean level for larger urban regions is quite high, suggesting that this measure of productivity is highly specific to conditions in particular regions. If we turn to productivity as measured by the average wage per worker the results are only somewhat different with the Third Order Rural category diverging from the other four.

Not surprisingly, average wages are considerably lower than GDP per worker. For larger urban centers the results show far less dispersion and the advantage of being a provincial capital disappears. Instead average wages seem to decline somewhat as regional population declines, with an average around

\$33,000. In the City and Regional Town categories average wages are somewhat lower than for urban centers, but the average wage for the larger regional centers is very similar to the average wage for the smaller urban centers. More interestingly, the variability within the category is much higher for the smaller regional towns, with the two smallest members of the category, Happy Valley Goose Bay and Labrador City, having the highest average wages. The distribution for First Order Rural Region average wages shows considerable variability with an average in the \$25,000 to \$30,000 range, but with no major outliers. For Second Order Rural there is considerably more variability with 7 of the 39 regions having an average wage above \$40,000. Once again variability is much higher for the smallest members of the category than for the larger. Average wages are not available for many of the Third Order Rural regions because of disclosure problems associated with small numbers of workers. By this measure those Third Order Regions close to large urban centers are more likely to have low wages and those that are most remote have high average wages that exceed averages in the most urbanized regions.

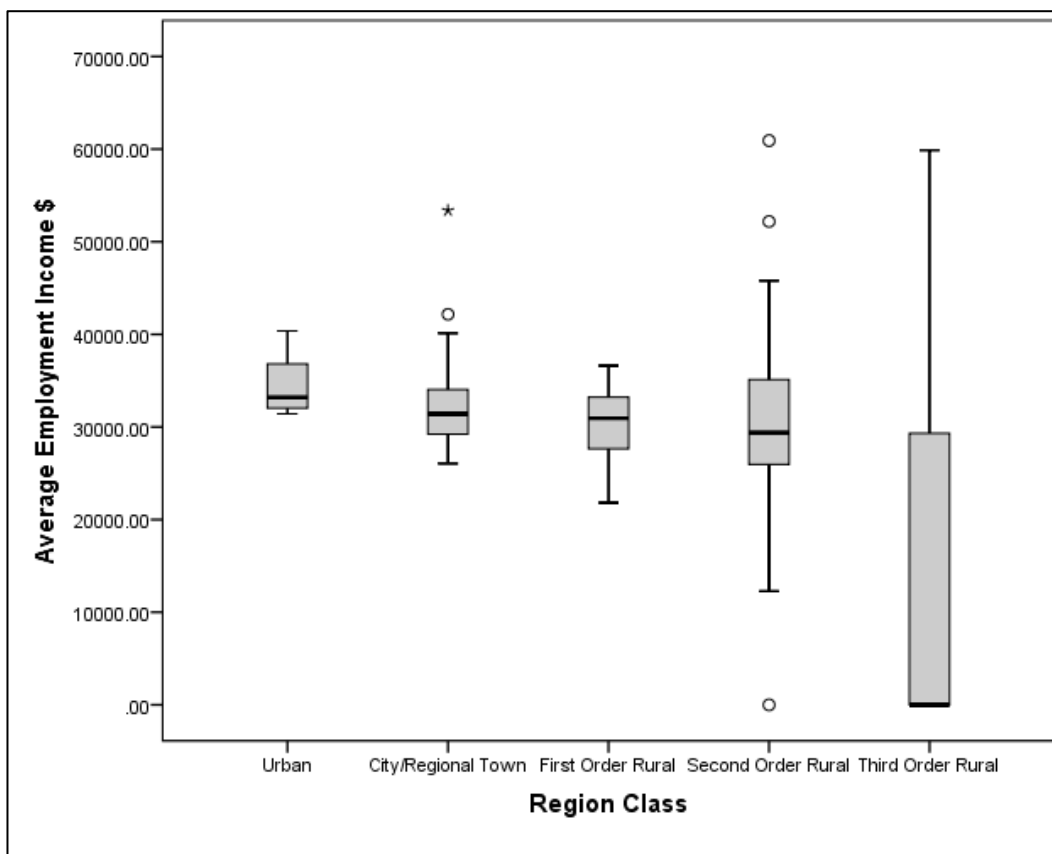


Figure 4: Average Income per Worker by Functional Region

When the two measures of productivity are compared the main finding is that the GDP per worker results are systematically higher and less variable than the results using the average wage. While there is some change in the relative levels of productivity within classes, the larger result that average productivity declines only modestly as size category declines holds with both measures. This suggests that the development problem of smaller regions in Atlantic Canada is not simply a problem of much lower productivity relative to metropolitan regions.

Finally, we look at changes in productivity over time, as measured by the change in GDP per worker between 2003 and 2007 (Figure 5). In regions where the measure is increasing we could expect that

productivity is increasing and these regions are increasing their competitiveness, or at least catching up. In the most urbanized regions the average increase is about \$3,000, with all the provincial capitals but St. John's having increases of \$5,000 or more. In the City and Regional Town category the average increase is above \$3,000, but with more variability. Of the 29 members of the category, 11 had increases in excess of \$5,000 while 2 had decreases, or declines in productivity. First Order Rural regions had even more variability with 7 regions having declines or no growth, and 3 having growth in excess of \$5,000. Second Order Rural results are clouded by a huge increase in Buchans NL over the period reflecting a major mine expansion. But, for other members of the group, the majority experienced increases of less than \$3,000 or declines. Third Order Rural Regions had the greatest variability. For those close to a large urban region where data is available, about half had increases and half had decreases in GDP per worker. Autonomous CSDs near medium size regions performed well on average with about one third of them having increases of over \$4,000. Similarly, the most remote single CSDs were about evenly split between those with modest increases in productivity, those with declines in productivity and those with large increases in productivity.

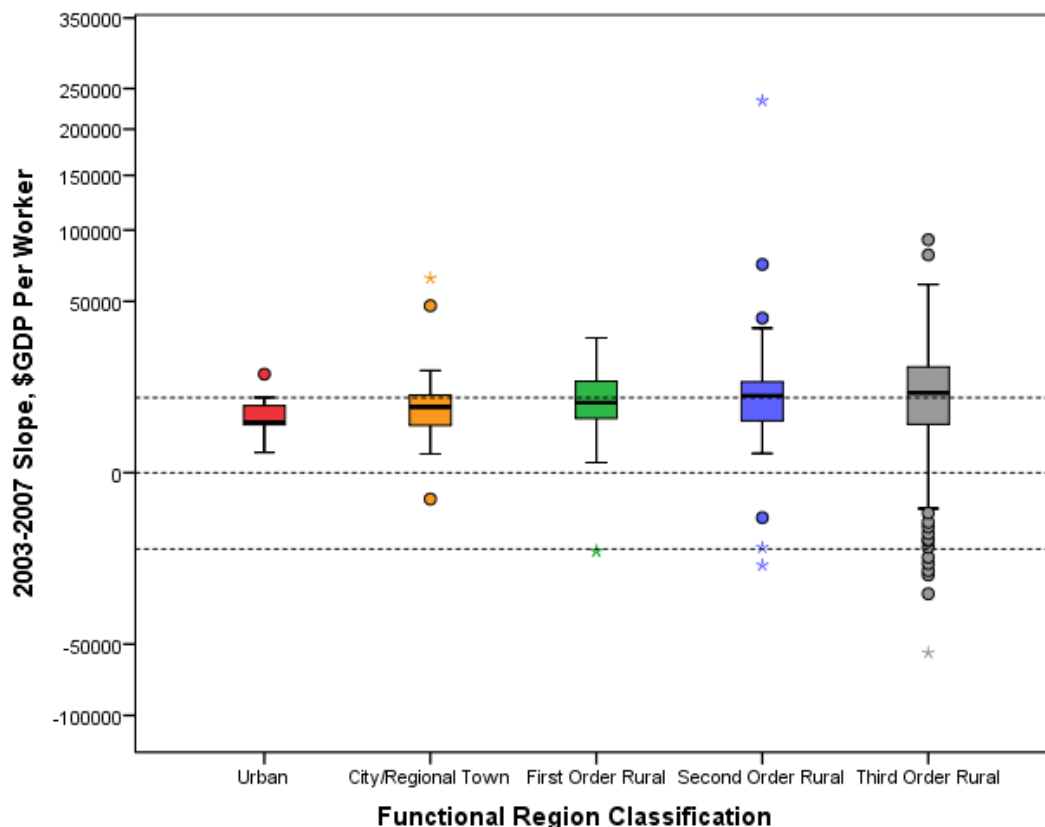


Figure 5: Change in GDP per worker 2003-2007 by FER Category

These three sets of data, each showing a different measure of productivity, suggest that while productivity is highly variable in smaller regions it is not uniformly poor. By Krugman's measure of viability this suggests that there is an ongoing economic role for many of the smaller regions in Atlantic Canada and that on a per capita basis these regions can outperform large urban regions. Of course the number of jobs in a small region is miniscule when compared to even a small urban region, such as New Glasgow NS FER. The next step in the analysis is to try to identify the factors that lead some smaller regions to have high levels of productivity while others do not.

A number of plausible factors could explain differences in productivity. The first is a relatively small number of workers in the regional population. In small places there can be a high number of retired workers who have retirement earnings that stimulate local economic activity even if transfer payments are not part of GDP. Second, productivity in the natural resource sector is typically high as capital is substituted for labor in agriculture, forestry, mining, energy production and the fishery. While some resource based regions have experienced significant declines in recent years, these might be expected to be the least productive with those remaining having higher productivity. Third, seasonal employment is also high in rural Atlantic Canada and this may depress average wages, because of the short work interval, by more than it depresses productivity. Fourth, small size may be an advantage in increasing productivity if there is an entrepreneurial culture. In a small economy, individual actions can influence the aggregate outcome. If a small number of people introduce new activity this could have a considerable impact on local results. Only some of these potential sources of productivity gains can be measured with existing data sources. In the following paragraphs we address some of the underlying influences on productivity.

Seasonal Work: Atlantic Canada has a high incidence of seasonal unemployment, especially outside the large urban agglomerations. This reflects the large role that resource based sectors, including outdoor tourism, play in local economies. High seasonal unemployment rates both reduce household income and negatively affect productivity. Using the GDP per worker measure, if output is only produced in part of the year this will bias down productivity. Similarly, if average wage is calculated as total wages divide by the number of workers, the inclusion of seasonal workers will lower total wages, lowering average wages overall. If productivity could be measured in terms of output per hour worked this problem would be reduced.

The influence of seasonal unemployment can be captured by looking at the average number of weeks worked in each functional region. Figure 6 shows that average weeks worked declines as rank in the regional typology falls. In addition, variability within each category increases as rank falls. Importantly, other than the very largest regions there are many regions where the majority of workers are not employed full time (more than 40 weeks a year).

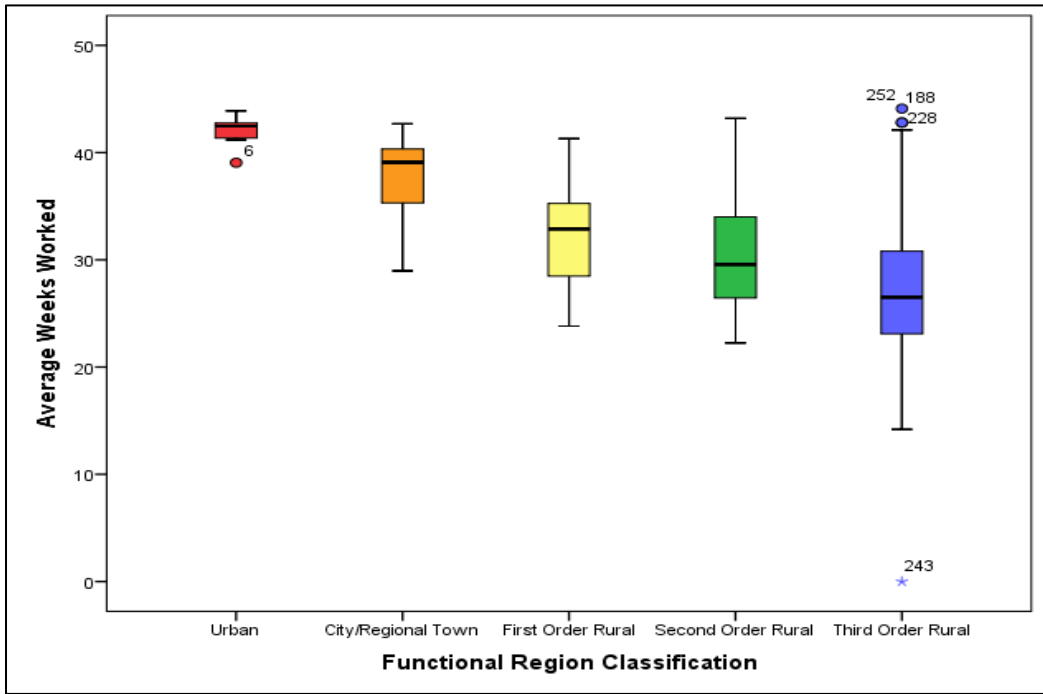


Figure 6 Average Weeks Worked (2007) by FER Category

Detailed analysis for the different categories of region shows that in the large urbanized regions the majority of workers are full time, except in Charlottetown PE, Lunenburg NS, New Glasgow NS and Cape Breton NS. In particular, the Cape Breton region has a very high incidence of seasonal workers. In the City and Regional Town category only 5 regions have average weeks worked above 40, but all but 1 have an average greater than 30. For the Rural 1 category only 2 regions have an average above 40 weeks, with the majority near 30 weeks and a considerable number at or below 25 weeks. In the Second Order Rural Regions the average falls to below 30 weeks, but with only 3 regions at or below 25 weeks. Third Order Rural Regions close to a major urban region are fairly diverse, with most having less than 30 week averages, but some at or above 40 weeks. Third Order Rural Regions near medium size regions and those that are remote have the lowest average weeks worked, with some experiencing averages below 20 weeks and the majority between 25 and 30 weeks. Clearly opportunities for full time employment are stronger in larger regions, and in regions near to larger regions.

Primary Industry Dependency: Seasonal work in Atlantic Canada is associated with natural resource based industries, particularly agriculture, fishing and tourism. Other resource based industries, mining, energy and forestry are somewhat less seasonal in nature. In general, productivity in the resource sector is high, but there are clear exceptions for small scale firms in fishing, agriculture and tourism where output per worker is low. Larger firms tend to achieve high levels of productivity by adopting new technologies that substitute capital for labor. The consequence is falling employment even as output increases. Whether workers capture the returns from increased productivity depends on the nature of the local labor market. If skills do not depend on formal levels of education and training, and if there is an excess supply of local labor then average wages can be low relative to GDP per worker.

Regions dependent on primary industries face intense international and national competition and cyclical demand. High levels of productivity are required for economic growth to occur, since firms in these industries compete directly on price. Moreover, regions more remote from markets face the burden of absorbing higher transport costs, since prices are set at the delivery point and producers effectively absorb freight charges. Resource based industries can face problems of depletion that increase the cost of production or reduce the available quantity or quality of the resource. This is clearly true for minerals, but can also be true for fishing (species depletion), forestry (slow growth rates and high hauling costs) and tourism (worn out facilities).

Figure 7 shows degrees of dependency on the primary sector. The median level of primary sector dependency first increases and then decreases as rank in the regional typology falls. First Order Rural Regions have on average the highest degree of primary industry dependency, but extreme values for dependency are highest in the two lower order rural regions. In addition, variability in dependency within each category increases as rank falls.

Detailed results for the different categories of region show that in the large urbanized regions dependency on the primary industries is low, less than 8%, for the largest members of this category, those with regional populations over 100,000 (plus Charlottetown PE). But the four smaller regions in the category depend on the primary sector for more than 10% of their GDP. In the City and Regional Town category five regions have a primary industry dependency ratio in excess of 25%, but almost as many have a ratio near 5%, and the majority of regions lie in the 10% to 20% band. For the First Order Regions, five regions have a dependency ratio above 50%, yet six have a ratio near 5%, with the majority clustered near 25%. In the Second Order Rural group there is a bimodal distribution with about half of the regions having a low primary industry dependency, about 55%, and half being highly dependent, about 40%. Limited results are available for Third Order Rural regions, but those close to a major urban regions show no real pattern with primary industry dependency varying from 55% to almost 100%. These results also hold for Third Order Rural regions near medium size regions and those that are

remote. This suggests that resource dependency is highly variable, and perhaps bimodal, in the three rural categories. It is also quite variable in the two urban categories but with much less dispersion.

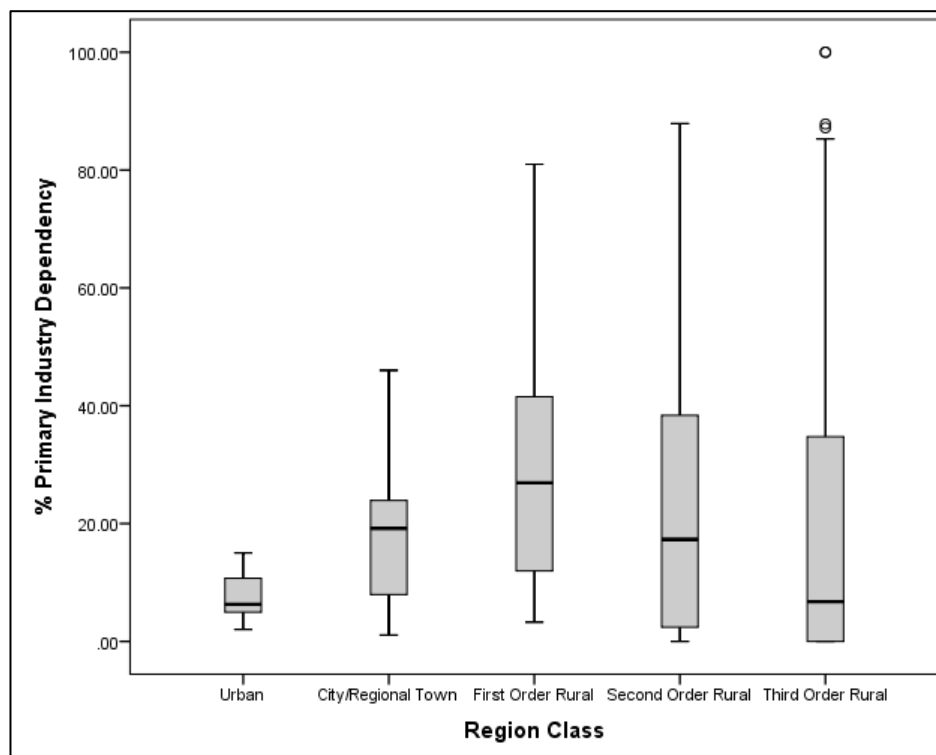


Figure 7: Primary Industry Dependency Ratios by FER Category

Industry Diversity: The converse of resource specialization is a diversified economy. The logic of the urban hierarchy is that economic diversity increases with the size of a region because it has both a large home market while proximate regions provide an additional source of demand for many of its more specialized goods and services. The formal logic of the hierarchy implies that all regions of a given population should provide a similar mix of services, but this logic assumes that the population and urban places are regularly distributed across a featureless plain. In reality, especially in Atlantic Canada, population is distributed in a highly irregular way, transport networks are incomplete and distances between settlements can be large. As a result, places of similar size can have very different mixes of industries and considerable diversity in the range of goods and services that are available locally. In particular, because there is some minimal set of public services that governments provide to virtually all citizens, there are remote, small population regions that have much larger service center functions than their internal population would require.

We form an index of industrial diversity that uses the set of goods and services available in the Halifax FER as a reference point. The set of goods and services in all other regions in Atlantic Canada is compared to this reference point and a ratio is formed that captures the relative availability. The Halifax region is given a score of 1, with other regions ranging from close to 1 to below .1, for the smallest places that offer only limited goods and services. In these places people may have access to other goods and services but people have to leave the region to acquire them.

Figure 8 shows that the average range of goods and services declines fairly rapidly as the rank in the urban hierarchy falls. The median level of goods and service in a category is well below the median for the next highest category. But we see that there are regions in the rural categories that provide a similarly complex mix of goods and services as regions that are one or two levels higher in hierarchy.

Similarly, there are larger rural regions that provide far fewer goods and services than is common for their size group. This suggests that economic function can vary considerably among regions of roughly similar size.

In the large urbanized regions, diversity is high with all but the smallest region, New Glasgow NS FER, reaching 90% of the complexity level of the Halifax region. In the City and Regional Town category, diversity scores decline steadily as the population falls, from almost 90% in the largest to about 70% in the smallest region in the category. Since population falls from about 40,000 in the Saumarez NB FER to about 10,000 in the Labrador City NL FER the steady decline is not surprising. What may be unusual is that through local provision a region with 10,000 people can achieve 70% of the level of goods and services available in a region with over 400,000 people. Within the First Order Rural Region category, a few regions have a diversity score above 70%, but these are not the largest population regions. The majority of the regions score in the 60% to 70% band, with only a few below 50%. In the Second Order Rural Region group there is greater diversity with some of the larger population regions at or near 60%, but with the smaller population regions clustering below 40%. Third Order Rural regions close to a major urban regions show no real pattern with primary industry dependency varying from 55 to almost 100%. These results also hold for Third Order Rural Regions near medium size regions and those that are remote. This suggests that resource dependency is highly variable, and perhaps bimodal, in the three rural categories. It is also quite variable in the two urban categories but with much less dispersion.

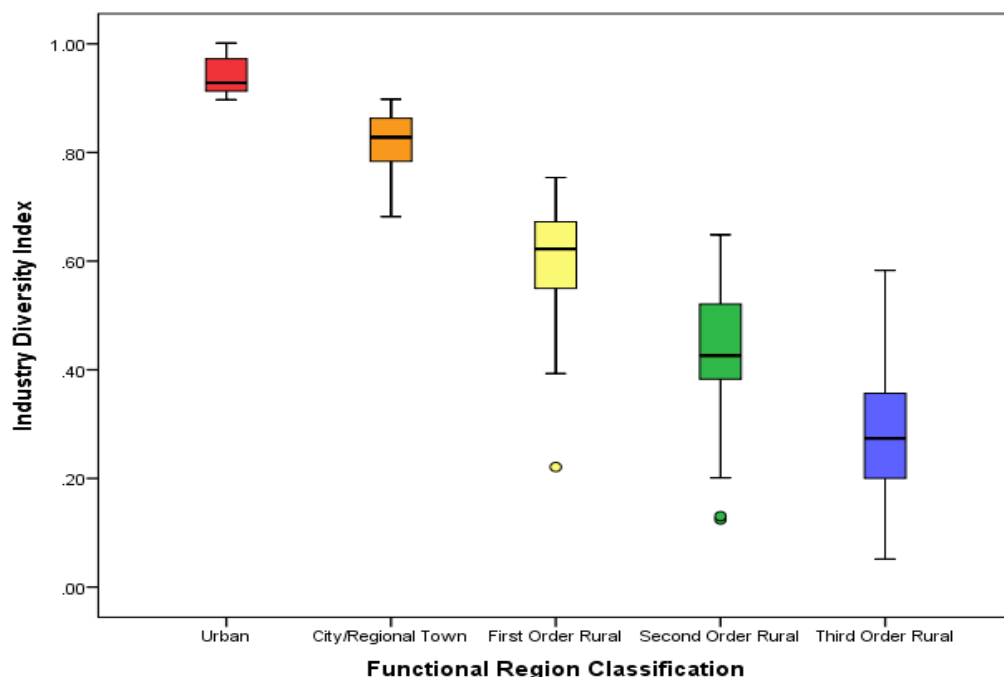


Figure 8 Industry Diversity Index by Category of Functional Economic Region

New Business Formation: It is generally thought that economic growth is associated with a high rate of new business formation. New businesses are associated with high rates of entrepreneurship and the growth of local demand. In regions where there is an increase in the number of businesses there is likely to be a more positive trend in economic conditions, reinforced by the increased number of firms. To control for differences in the size of regional economies we express business growth from 1997 to 2007 as a percentage of the initial number of businesses in 1997. For the smaller rural regions, the percentage changes are difficult to interpret because the base number of firms in these regions is so small that a small increase or decrease has a large effect.

Figure 9 provides an overview of growth in the number of businesses by category of region. In general net business formation in the regions of Atlantic Canada has been weak over the period, most likely due to the length and severity of the global recession. In terms of median values the largest regions performed better than smaller regions over the period, with lower median values occurring as rank in the hierarchy declines. However, variability in performance increases as rank declines and all ranks but the largest urban centers contain members that have experienced large percentage increases in the number of businesses in their region.

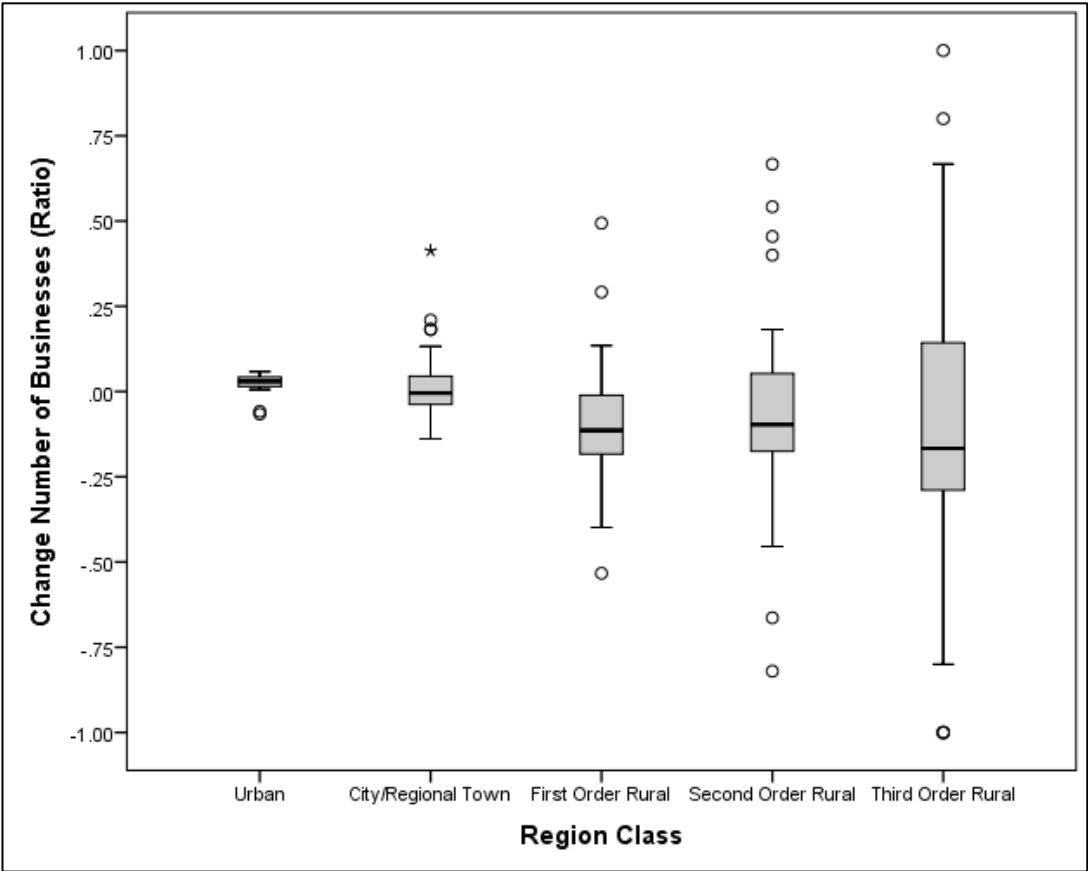


Figure 9: New Business Formation by Functional Region Category

In the large urbanized regions, the growth of new businesses is relatively small, reflecting the large number of existing businesses at the start of the period. Growth rates mostly lie in the 2% to 4% range. However, business numbers grew at less than 1% in the Halifax region and declined by about 6% in both Charlottetown PE and Truro NS. In the City and Regional Town category the number of businesses fell in almost all the larger members of the category, while in the smaller half of the category, numbers either decreased slightly or increased significantly with some regions experiencing 20% or more growth. In the First Order Rural category, the majority of regions experienced modest declines in the number of firms. In the Second Order Rural group declines of around 20% were common, but there are regions with significant growth. Data is limited for Third Order Rural regions but those close to major urban regions show no real pattern with most experiencing small gains or small losses and with a few having relatively strong percentage growth. Third Order Rural Regions near medium size regions largely experienced a decline in business numbers, with about a third of the group showing some increase. Finally, the most remote Third Order Rural Regions also had declines in about two-thirds of the members and growth in one third.

Labor Force Participation Rate: Another way to assess how well the regional economy is performing is to look at the labor force participation rate. This is especially useful when regions are defined in terms of local labor markets. If the regional economy is in good health there should be a high rate of participation. Conversely, if the region is performing poorly, or if firms are increasing productivity by replacing labor with capital, we would expect to see low participation rates. Typically, participation rates are higher in larger labor markets because the larger variety of employment opportunities makes it easier to match worker skills with job requirements. In addition, the large size of the market makes it easier for job seekers to find work close to where they live. Countering this is the phenomenon that in smaller remote regions with inhospitable climates and few amenities there can be a strong incentive for unemployed individuals to relocate. This too would lead to a high labor force participation rate. Notably this measure does not address the role of those either too young or too old to be included in the labor force.

Figure 10 provides an overview of labor force participation by category of region. The median level of participation declines as the size of region shrinks with the large urban region having the highest participation rates. The small size of the boxes indicates that 50% of the regions in each category are relatively close to the median in terms of participation rates. However as the size of region declines variability increases and for the smallest category, Third Order Rural participation rates range from virtually 0% to around 90%.

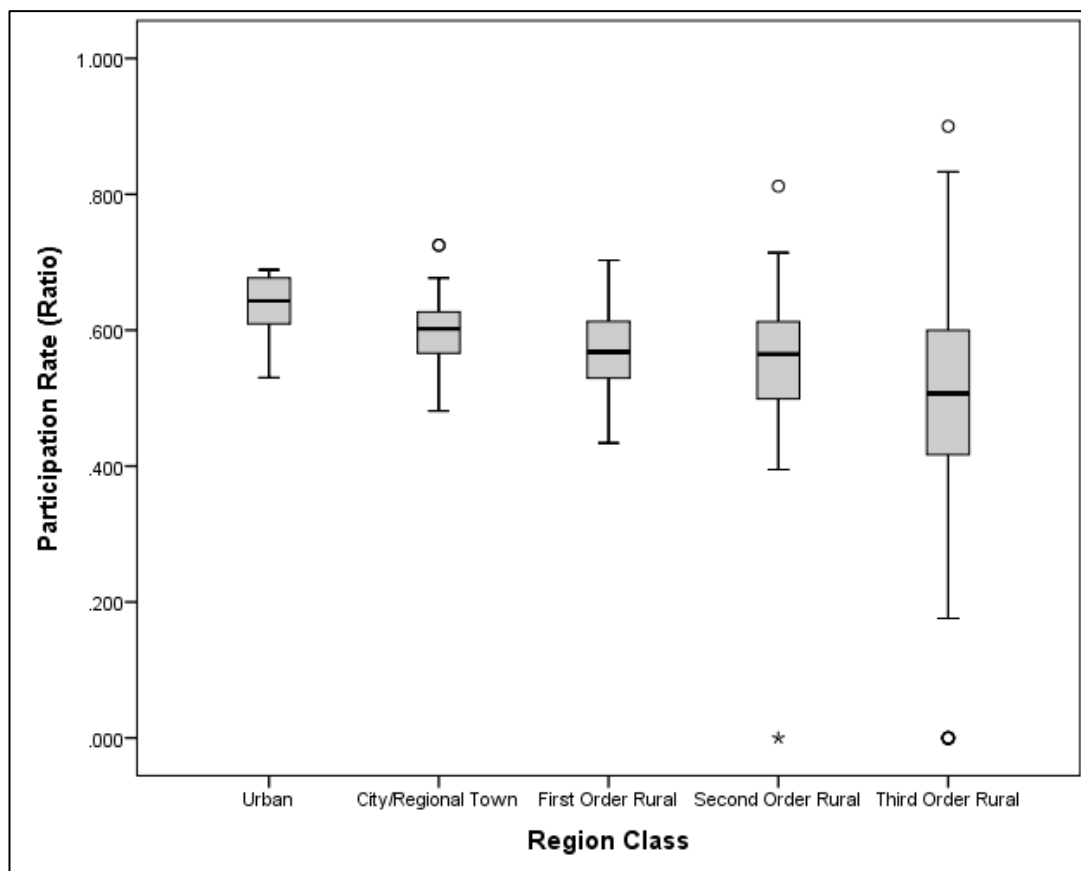


Figure 10: Labour Force Participation Rates by Functional Region Category

More detailed results for the different categories of region show that in the large urbanized regions participation rates approach 70%. However, in the Cape Breton region it is close to 50%. In the City and Regional Town category, the majority of participation rates are near 60%, with only one region,

Stephenville NL, under 50% and the two regions in Labrador, Happy Valley Goose Bay and Labrador City, over 70%. For the First Order Rural Region category participation rates are mostly over 50%, but typically below 60%. In the Second Order Rural group the degree of variability in rates increases with a few near 70%, but the majority in the 50% to 60% range, and some as low as 40%. Third Order Rural Regions close to major urban regions have higher participation rates than others in the Third Order Rural Region category. In particular four regions in Prince Edward Island have very high rates of 80% and higher. Third Order Rural Regions near medium size regions have participation rates that mainly lie in the 30% to 50% band but with a considerable number of outliers. Finally the majority of remote Third Order Rural Regions have participation rates above 50%, with very few below 40%

Synopsis: In aggregate, these indicators suggest some important things about the distribution of economic conditions across the local labor markets of Atlantic Canada. The first is that productivity does not vary greatly by size of region. However, productivity is on average lower in smaller regions and to the extent that they are more export dependent and have to absorb freight costs this may be an impediment to economic development. Second the high rate of seasonal employment outside the major urban regions of Atlantic Canada is problematic both for the standard of living of those who only have seasonal work and because it can lead to lower productivity. Clearly, a contributing factor to the high level of seasonal employment is the dependence of some regions on primary industries that are inherently seasonal. However, while primary sector dependence increases as the rank in the urban hierarchy declines, there are numerous regions in the three rural categories that have a low reliance on the primary sectors and conversely there are some regions in the two more urbanized categories where primary industries remain important.

This last point is reinforced by looking at the industry diversity index. As the urban hierarchy requires the median degree of diversity declines as you move to smaller regions. But, just as Pred describes, there is considerable horizontal trade among regions and some small regions have a high degree of diversity in their economic structure. This phenomenon is reinforced by large distances and low densities, especially in Newfoundland and Labrador and New Brunswick where small places can take on higher order functions that cannot be provided by a higher rank region because of distance constraints. In all of Atlantic Canada there has been limited new firm formation between 2007 and 2011. This problem is pervasive across the entire typology with examples of regions in each category experiencing significant declines in firm numbers. However, in relative terms the better performing regions in the smaller size classes are doing as well or better than the larger urban regions. Finally, abstracting from the existential problem of an aging population and a shrinking work force in all of Atlantic Canada, if we examine labor force participation rates we see that they decline steadily with size of functional region/local labor market. This suggests a clear matching problem; and perhaps the effect of low wages and seasonal work, both of which reduce the incentive to be in the labor force. Notably average participation rates are not that much lower in small regions, although there is considerably more variability.

Forming Policy for Functional Regions

The Policy Context

Within Canada the four provinces of Atlantic Canada are typically seen as a one of five large sub-national regions (six when the northern territories are included), each of which requires some spatially differentiated policy treatment by the federal government. ACOA and the other federal regional development agencies reflect one way that the Government of Canada has carved out region-specific policy. Within Atlantic Canada, each of the provinces is a distinct political unit having specific rights and responsibilities under the constitution. This leads to policies that have a distinct provincial focus. Below the provinces are various administrative regions that have been defined by each province to organize

local government, or to deliver specific public services. In all of these instances there is the recognition that space affects the ability of a government to deliver policy to the target audience, and that differences among regions can necessitate differences in policies, or in policy delivery mechanisms.

To facilitate policy delivery, national and provincial governments typically use only a small number of policy subcategories, on the grounds that this results in more uniform treatment and allows fixed administrative costs to be spread over a large base. In some cases these policy subcategories are in the form of different policy options for some of the target groups. In other cases the same policies are provided to all, but delivered through regional service centers. The basic problem with this approach is that it can result in ineffective policy, either because the wrong programs are on offer or because the administrative boundaries of the region do not correspond to how people and firms interact across space.

Functional Regions as Policy Units

Typically governments rely upon regions defined by administrative boundaries when developing regional policy. These can be: counties, cities and towns, school districts, health service regions or specialized economic development zones. In all cases a unit of government establishes lines on a map that define the space that is within a specific region. For some purposes the specific location of the boundary lines on the map is more a matter of convenience. For example, in the case of a health service district if someone arrives at a hospital but lives one kilometer outside the district boundary they are not refused treatment. In other cases the administrative boundary may correspond to a useful natural boundary. For example, watersheds make natural units for managing water quality.

In the case of economic development policy it can be difficult to define appropriate administrative boundaries. For large cities the boundary of the city is too small a unit to capture the integrated nature of the metropolitan region. For example, in the case of Halifax the urbanized portion of the city is only a part of a larger integrated economic unit that stretches across much of the central part of the province. Most importantly, the extent of the economic reach of Halifax varies over time. New or improved roads allow people to commute more easily into Halifax to work or shop. Conversely, higher gas prices make long distance travel less attractive. A stronger regional economy in nearby Truro could draw people away from Halifax, but conversely, more development on the periphery of the city of Halifax would likely extend its economic reach making the Halifax FER even larger. While it is easy to see that the economic development region of Halifax does not follow any administrative boundary, the more important question is how to define a useful territory for economic policy purposes.

Similarly, at the other end of the size spectrum, in more rural parts of Atlantic Canada, the boundaries of individual communities are easily determined because, except for Prince Edward Island, few people live in the open countryside. Instead, the local population is clustered in small settlements with mostly uninhabited territory separating them. However, while these settlements might have a high enough population density to be considered urban places, they have few, if any, of the characteristics of what is normally associated with a city.

In many cases the main economic activity in these settlements requires a considerable portion of the labor force to leave the community to work in a rural area. Notably, communities based on fishing, forestry and mining have their main economic activity outside the settled area. In addition, many of these communities are too small to be viable independent economic units. The population in an individual community may be too small to support the labor requirements of local firms, or for the efficient delivery of local public services, like schools, hospitals, police and solid waste management.

For these rural places the problems of economic development demand the aggregation of multiple communities into some form of collaborative structure. This may involve formal amalgamation of local governments, but various forms of cooperative behavior can typically deliver equivalent benefits without

the political controversy that comes with forced amalgamation. An alternative to administrative regions with their formal boundaries is the functional region based upon self-organizing behavior (Krugman, 1996). Instead of an external government agency drawing the boundary to define the region, boundaries are developed from observing the spatial behavior of individual agents.

A common way of introducing self-organization is to look at worker commuting patterns to identify local labor markets as functional regions. Regions based on local labor markets are useful in describing the spatial boundaries of a local economy. These regions are also useful for policy development because they aggregate nearby communities into a region. Five distinct types of regions have been identified in the analysis, and while there is variability within each region type the internal differences within each category are less than the differences between categories. Notably, the five categories provide the opportunity to develop a manageable number of policy regimes that provide more flexibility than generic policies, but less complexity than tailoring policies to the unique needs of individual regions. But just as importantly regions that are functionally similar can learn more from each other than they are likely to from nearby regions that have different economic specializations.

A clear advantage of adopting an Atlantic Canada wide approach is that there are few large and medium size regions in each province, so a provincial approach to defining policy makes it hard to identify peers. Importantly the regional categories transcend provincial boundaries. This allows policy makers to compare regions in one province that are more similar to regions in another province than they are to adjoining regions within the same province. For example, the problems facing regions with a historic dependence on a large pulp and paper mills for employment are fairly common across Atlantic Canada. However, the number of regions with this specialization is small in any one province, while more numerous for the entire Atlantic Canadian region. This allows the possibility of developing sets of economic development policies that are tuned to specific types of region across Atlantic Canada.

The main contribution of the analysis in this report is to identify differences among various regions within Atlantic Canada that have been constructed on the basis of self-organizing behavior, not on the basis of administrative boundaries. By using local labor markets to construct regions we capture the spatial extent of an important part of local economies. As economic structure changes and job opportunities are created or destroyed these local labor markets will change their shape as workers adjust their commuting flows to find alternative employment opportunities.

But it must be recognized that for some forms of public policy, such as the delivery of health care or police services, the nature of the local economy and its geographic extent are not especially important in shaping service delivery boundaries. But where governments are engaged in efforts to expand levels of economic activity through development strategies and policies the nature and boundaries of local economies becomes crucial. But the fundamental principle that policy has to be sensitive to spatial differences is true whether administrative or functional regions are used to differentiate space.

Why Regions of Unequal Size?

Atlantic Canada has been divided into 259 distinct regions, each of which comprises a local labor market. Within each region, the majority of those employed both live and work in that region. These regions differ greatly in geographic size, population and economic function. The largest region, centered on the city of Halifax, has 412,000 people and stretches across Nova Scotia to the Bay of Fundy. The major part of this region is the Halifax Regional Municipality (HRM), which itself represents an extended territory greater than the urbanized portion of the city, which has 390,000 people. The urbanized portion of the HRM, the former cities of Halifax, Bedford and Dartmouth, has a population of 298,000. While the former cities account for the majority of the population and economic activity of the Halifax functional region, there is still a considerable number of people and degree of economic activity in more rural territory that is strongly connected to the urban core.

On the other hand, the smallest regions have populations of less than 200 and are found along the coast of Newfoundland. They contain very small settlements with weak local economies and very low levels of employment and very little activity or population in open territory outside the small communities. The use of small regions is a distinct feature of the analysis. Typically regional analysis aggregates small rural regions into large units in order to construct regions of similar size. The belief is that this results in regions that can achieve “scale” effects. But where the resulting region is only weakly integrated economies of scale will not be achieved. Certainly an important policy objective is to build regions that are as efficient as possible, but when local labor markets are small and poorly connected it is only possible to construct larger regions if the local labor markets become better linked.

Importantly, the set of regions that have been developed is consistent with the logic of the urban hierarchy especially as it was described by Pred. Regions have different sizes because they have different functions. But if the relationships among regions only followed the vertical flows described by Christaller it would be possible to only consider a small number of large regions centered on the largest urban places. These places would have unique hinterlands made up of lower order regions. But Pred recognized that the simple vertical hierarchy is too restrictive and regions can form complex relationships that flow horizontally. This means that policy also has to recognize the existence of more complex relations among the different levels of the urban hierarchy.

The large number and high degree of diversity in the size of regions is especially important for policy formation. No government can design individual policy responses for this many regions. What is needed is some mechanism for grouping regions into a small number of groups that have similar members. The government can then offer a tailored policy menu to each group. While geographic proximity has typically been used by governments in forming its groups we believe this is not the best approach for economic development policy. Places near to each other can experience very different economic circumstances and have different development options.

We use size of region, as measured by population as the starting point for defining a small number of distinct policy regimes. Size of population is highly correlated with the size and complexity of the regional economy. It is also highly correlated with the level of workforce skills, the quality of public services and the degree of connectivity (roads, airports, internet access, etc.). Importantly, the local development capacity is much stronger in larger regions both because they have more local staff engaged in the topic, but also because they have stronger skills and more resources. Support for economic development initiatives can be more effective by explicitly recognizing that different size places have distinct opportunities.

As Figure 11 shows, the distribution of regions follows the common pattern given by Zipf’s Law - that the population of a region is inversely related to its rank in the size distribution. While the relationship is not exactly linear, this type of relationship holds with considerable regularity across nations. It is most commonly used to describe the relationship among city sizes. But it more generally shows that there is hierarchy of sizes of place/region with a small number of larger places that exhibit a fairly regular decline in population size that follows their rank in the distribution, and a very large number of small places/regions that have relatively small populations.

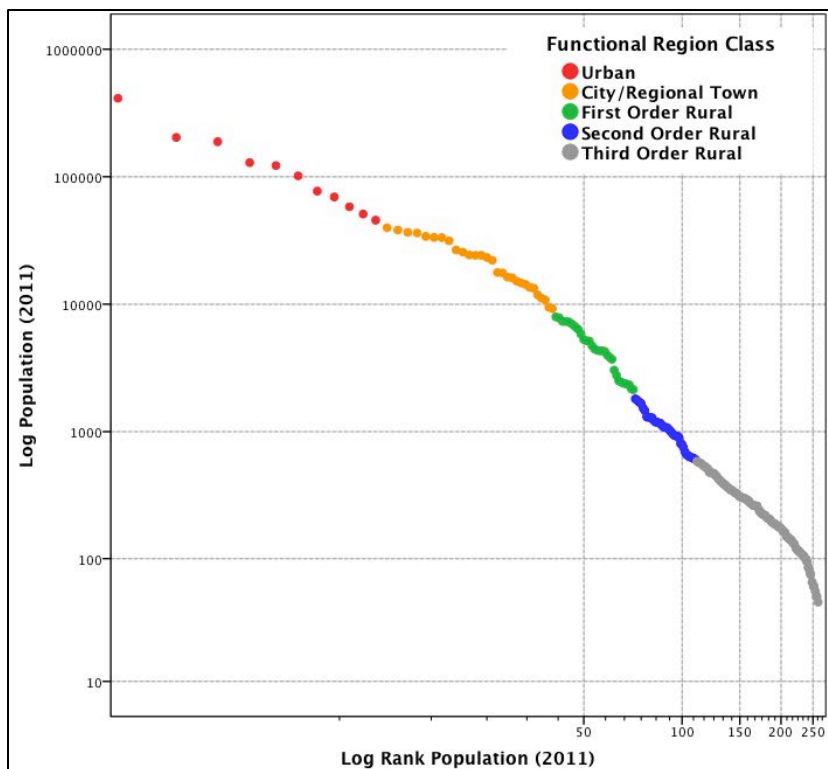


Figure 11: Size Distribution of Functional Regions

Economic Growth Opportunities Vary By Size of Region

An important lesson for policy from this distribution is that while a large share of national or provincial population and economic activity is found in a small number of large regions – those with the highest rank, the large number of smaller regions, in aggregate, also account for a considerable share of aggregate population and economic activity. The OECD has shown that between 1995 and 2007 the largest regions, 8% of the total number, accounted for 32% of economic growth in the OECD, but the remaining regions account for 68% of growth (OECD, 2011).

More recently the OECD has shown that regions can be usefully divided into those with above average growth and those with below average growth (OECD, 2012). Regions with an initial per capita GDP of 75% or less of the national average in 1995 are said to have Low Catching Up Potential (LCUP), while those regions with per capita GDP above 75% of the average, but below the average level of per capita GDP in 1995 are said to have Catching Up Potential (CUP) (OECD, 2012, pp. 38-39). Figure 12 reproduces OECD results for six types of regions. Importantly, while most growth comes from those regions with higher initial per capita GDP, it shows that lagging regions with faster growth can make significant contributions to growth over time. Further analysis of specific regions by the OECD suggests that developing integrated approaches to regional development are important in stimulating growth. For

Table 1.6. Distribution, contributions to GDP growth and population share for the six regional categories, 1995-2007

	Growing above average	Growing below average
Regions with large catching up potential (LCUP)	37 regions or 11% Population share = 8% Contribution to growth = 4%	15 regions or 4% population share = 3% Contribution to growth = 1%
Regions with catching up potential (CUP)	61 regions or 19% Population share = 18% Contribution to growth = 21%	103 regions or 32% Population share = 24% Contribution to growth = 17%
Advanced regions	54 regions or 17% Population share = 26% Contribution to growth = 39%	55 regions or 17% Population share = 20% Contribution to growth = 17%

Source: OECD Regional Database (2009).

lagging regions crucial bottlenecks take the form of: weaknesses in human capital, especially for those at the bottom if the skill distribution; low rates of labor force participation; weaknesses in innovation at the regional level; low levels of worker productivity; limited connections to larger markets; and, in some cases, the absence of infrastructure – if other growth impediments are not binding (OECD, 2012 pp. 60-61).

Figure 12: Distribution of Regions Analyzed in OECD, *Promoting Growth in All Regions*

Source: OECD, 2013, p. 39

In summary, the OECD analysis shows that national governments should be concerned with increasing growth in all regions, not just in large metropolitan agglomerations if they want to maximize the economic potential of the country. This includes regions where there are only small cities or market towns and regions where there is little urbanization. Some rural regions already exhibit a high rate of economic growth, in some instances more than all but the fastest growing metropolitan regions. The crucial issue for government is to identify policies that help facilitate growth in a variety of types of region. Because economic structure varies by type of region a key focus for government should be on increasing productivity, not on propping up weak firms or simply providing income support to under-employed workers.

The Importance of Focusing on Productivity

The second major innovative policy prescription in our analysis is that national and provincial support for local economic development should focus on increasing productivity. In the environment of shrinking workforces that characterizes Atlantic Canada, the main way that economic prosperity will occur is through higher levels of output per worker. In particular increasing levels of productivity will be the main

means by which people and firms in small and remote regions will survive. Our focus on productivity reflects the fact that we are dealing for the most part with small and very small economies in the majority of cases. In only the largest size category is the population large enough to be considered to have any endogenous growth potential. In all other cases the fate of individual firms largely determines the fate of the region in which they are located. Productivity is the largest factor influencing competitiveness that can be influenced by the firm. Distance to market, the behavior of competitors, the stage of the business cycle and macroeconomic policy are all important but the firm cannot influence them; however, it can influence productivity and regional economic development policy can help or impede the efforts of the firm.

In a series of studies, the UK government identified productivity as a key driver of economic growth (HM Treasury 2001, 2003 etc.). Yet, in the past, regional policy has tended to emphasize increasing the number of employed people as the main economic objective. The emphasis on employment was understandable in a period of high unemployment, a growing workforce and relatively strong job opportunities in natural resource extraction and first stage processing. But, going forward one of the crucial challenges for Atlantic Canada is a shrinking population and more importantly an aging and shrinking workforce. In addition, Canada is a relatively high wage environment when compared to developing countries, so future opportunities for the employment of unskilled, low productivity workers in tradable sectors will remain limited.

The choice of an appropriate measure of productivity is particularly important in Atlantic Canada because of the prevalence of seasonal labor in the natural resource industries. If productivity is measured by output per worker, then it implicitly assumes that all workers work the same number of hours. If value added, or GDP, is used as the measure of productivity then low levels of GDP in a region may reflect a seasonal industry, like tourism or fishing. The problem is minimized if productivity is measured in terms of output per hour worked, but then seasonal industries can appear more valuable than they are in reality, because they produce significantly less annual output and provide less annual income to workers. We use GDP per worker as the measure of productivity mainly because it is broadly available. But in smaller regions that tend to be dominated by the natural resource sector the resulting measure of productivity is biased downward because output of the firm is inherently lower than would be expected if it operated all year. On the other hand, the common reliance on seasonal employment insurance in seasonal industries provides an implicit benefit to low productivity firms because workers will accept low wages during the period of employment because the work provides them with transfer income for the balance of the year.

In any type of region productivity is enhanced: by improving the management and competitiveness of firms, by improving workforce skills; by increasing the rate of innovation; by fostering competition among firms in the region to improve efficiency; and by ensuring that adequate funds are available for investments by firms and for improvements to infrastructure (Figure 13). Specific opportunities for implementing these broad strategies will vary by type of region. In particular, smaller regions with low populations may face important challenges in some of these fields, especially introducing innovation, fostering competition and in ensuring adequate access to finance. But for regions that have small economies and population, productivity is vital, because they have virtually no home market and are only viable economically if they can produce one or two tradable outputs that can be competitively exported to other regions to generate revenue to support the local economy.

In the balance of this chapter we explore opportunities for developing policies that focus on expanding regional productivity. The rationale is simple: small regions can only survive if they have an economic

function, or if they are continuously propped up by transfer payments from higher levels of government⁴. Transfer payments may offer the appearance of regional viability, but the region provides no contribution to the larger economy and can actually reduce aggregate output by diverting resources into non-productive uses. By contrast, strengthening the economic function of small regions makes them net contributors to national economic growth. The art of policy formation lies in identifying the strengths of various types of region and in finding appropriate support mechanisms that enhance their contribution to the larger economy.

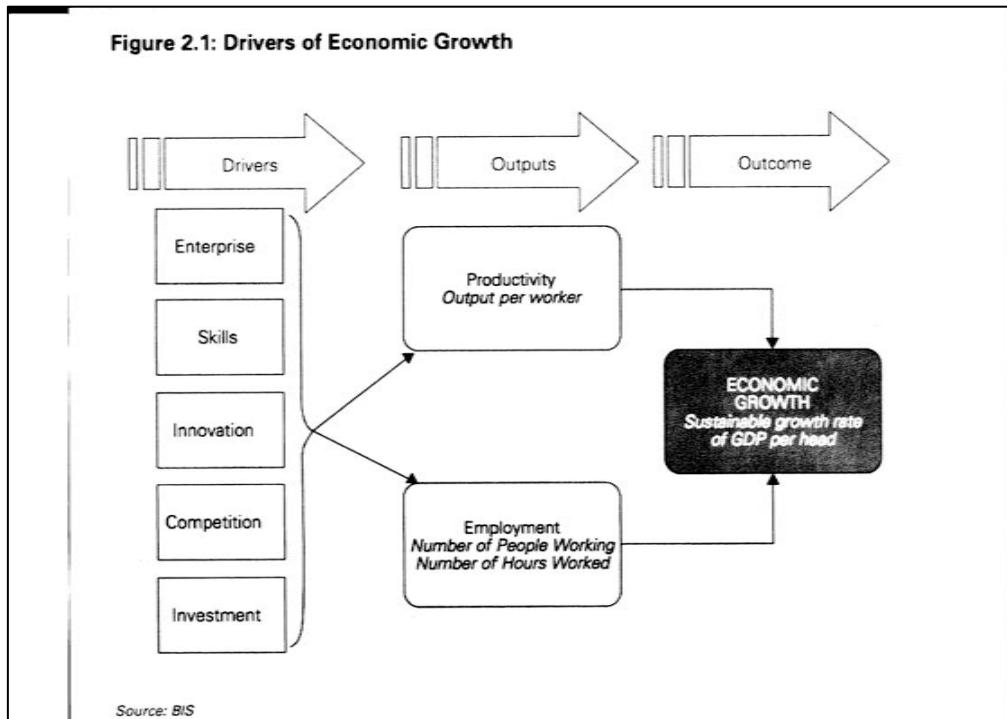


Figure 13 Drivers of Growth

Source: HM Treasury 2000

Differentiated Economic Development Opportunities

Opportunities for improving productivity vary considerably among regions. The five drivers identified by HM Treasury operate differently in a large metropolitan region that has opportunities for endogenous growth than in a small remote region that has a single employer and is essentially a company town. In larger regions the major urban center is the primary engine of growth and the hinterland mainly provides supporting functions that facilitate growth. In these larger regions a well-diversified economy ensures competition in most sectors, because there are multiple firms in the same industry; can generate most of the financial resources needed for investment internally; can support formal innovation activities in strategic areas; can take advantage of a range of skill development efforts, including local higher education facilities and practical workforce training programs; and can facilitate new firm formation.

⁴ By the usual standards for regional analysis, any region in Atlantic Canada, other than the Halifax region, is small. Typically, regional analysis presumes regions of at least 250,000 in size so there are opportunities for endogenous growth and a complex regional economy.

At the other end of the size spectrum, small remote functional regions lack the capability to do any of these things. Indeed in the smallest regions in Atlantic Canada the salient question is whether there is any meaningful opportunity to foster economic growth. In isolated regions with fewer than 600 people, the majority of whom are elderly, key impediments to growth and improved productivity are: a very small and unskilled workforce; weak connectivity to other settlements and regions; too few people to make the local market attractive to anything but the smallest retail establishments; and the absence of most public services, including schools, health care facilities, police and fire services, water and sewage systems. Many of these regions were initially settled to take advantage of local inshore fishing opportunities, but the fishing industry has changed, in part due to species depletion, but also as a result of technological changes that have left these regions and settlements with no economic function.

Between the large and the very small, there is a distribution of regions that have moderate sized populations and a diverse mix of economic functions. In this distribution the larger regions have some of the internal capabilities of the big urban agglomerations, but not all of them and with a considerably smaller degree of influence where they are present. For all of these moderate sized to smaller regions the importance of improving productivity is crucial to their ongoing survival and growth. Regions without a major urban core have a small home market and truncated economies. Economic growth in these regions comes mainly from satisfying external demand. By definition this means the region has to be a competitive producer of tradables and can only capture market share if it delivers higher quality or lower price goods and services than other regions that are targeting the same markets. Improving productivity is the best means for these export-oriented regions to achieve this objective.

An important, but often unrecognized difference between large and small regions when formulating economic development policy is considerable differences in the both the probability of successes in achieving economic growth, and more importantly the probability of not achieving growth leading to economic decline. Probabilities of growth and decline vary considerably by size of region. The largest urbanized regions in Atlantic Canada may only grow slowly, but they are unlikely to disappear. These regions dominate Atlantic Canada in terms of share of population and economic activity (Figure 1). They will continue to attract in-migrants seeking better employment opportunities and an improved life-style. Their economies are stable with a high share of non-tradable services, especially provincial and federal government agencies. And, any development investment they make is small relative to the size of the local economy so even if it fails the adverse consequences are manageable.

On the other hand, Figure 11, above, also shows that there are large numbers of smaller regions in Atlantic Canada. On average productivity (per capita GDP) declines with size of region, because bigger regions, especially metropolitan regions, can take better advantage of scale economies and other agglomeration effects (Fratesi and Senn, 2009). However, variability in productivity increases as the size of regions falls. The largest functional regions in Atlantic Canada, those centered on major cities, are relatively tightly clustered in terms of a variety of measures of economic activity and potential. By contrast, as the size class of regions decreases, so do averages for the various measures of economic performance, but variability increases. In the case of smaller regions the best performing members of each size class perform at the same level, or higher, as the average for the large city regions in Atlantic Canada. On the other hand, the worst performing members of these smaller size classes perform at very low levels.

Key Policy Lessons

Two policy lessons can be derived from these empirical observations. The first is that small size does not necessarily imply poor performance. This is a reformulation of the important OECD finding that rural regions are not synonymous with decline (OECD, 1994). Indeed, productivity in small remote regions has to be high if they are to be competitive in distant markets. The second is that policy for small regions has to recognize that only some regions will grow and others will decline. In most instances, the main

competition for small regions in Atlantic Canada comes from other small regions in Atlantic Canada. While competition fosters improved productivity, some of the improvement comes from a survivor bias. Only the most productive regions survive and capture export markets. Policy can provide support to competing regions to help facilitate their development - indeed the government should not pick winners, but there will be winners and losers in the competition. Ultimately some regions will be better placed to take advantage of support when it is offered and will leverage this support to grow.

Increasing the success rate within a category of regions, measured in terms of productivity or some other indicator, is the main objective of regional policy. Clearly, policy makers face a huge challenge in designing policy in this environment. Fairness suggests that support should be available to all regions. Reality suggests that if only some will ultimately survive, much of the support provided will not accomplish anything. A solution to this dilemma is to embrace the bottom-up approach of the New Rural Paradigm (OECD, 2006). National and provincial governments can make a variety of support mechanisms generally available, but regions have to apply for support and perhaps meet minimal qualification standards. This approach does not “pick winners” but it provides a self-selection mechanism that can reduce outlays for programs in places where they will not be useful. Clearly provincial and national governments should err on the side of providing somewhat more support, because so little is known about predicting success, especially in small places.

Second, it is also crucial to recognize that regions within a size category are often in competition with each other for economic functions. This is particularly true for smaller regions, but it is also evident for larger regions. The location of major federal government offices in Atlantic Canada is an obvious example, especially in New Brunswick where three major cities compete. At another level, large city regions that host major research universities are affected by the success of their universities in becoming centers of knowledge for particular types of research that can in turn spin-off, or attract, private firms that commercialize research. However, other than in New Brunswick where the functional regions associated with Moncton, Fredericton and Saint John are adjacent, the larger urban regions in Atlantic Canada are far enough apart that they are not in direct competition for the majority of the economic functions they provide.

For smaller regions competition is more intense because these regions tend to have more specialized economies that are focused on similar types of tradable products. Further, competition tends to be strongest among similar regions within a province. For example, regions that have a historical specialization in forest products face the consequences of declining demand for wood and pulp that is leading to the closing of mills. In this process the most productive mills in a province are more likely to survive longer. Similarly, reorganization of the fishing industry has led to the closure of most of the small fish processing plants that relied upon the inshore fishery. The surviving fish processing firms are larger, more efficient and more strategically located in terms of serving more widely dispersed fishing fleets. Even in the case of smaller regions, where direct competition may be more from nearby regions, it is important to recognize from a policy perspective that all the regions of this size in Atlantic Canada essentially face the same broad set of development issues.

An important implication of this competition is that a region's place in the hierarchy is not assured. Higher performing regions will grow, and growth will tend to move them up a rank in the hierarchy as they increase population and add economic functions. Conversely, poorer performing regions will decline as they lose population and economic activity. Although the absolute number of regions at any rank in the hierarchy is not fixed, there is a general structure given by the rank size rule that requires some losers to offset the winners, especially in a context like that of Atlantic Canada where aggregate population growth is not expected.

Policy Design for Functional Regions

In this section basic policy attributes for the various functional region types are identified. The discussion and policies largely reflect the conditions described in the first part of the report in the section that looks at productivity by class and the factors that influence it.

Regions with Large Urban Centers

The larger urban centers tend to perform on an above average basis for Atlantic Canada. This largely reflects their inherent advantages in terms of virtually all measures of economic performance. However, the smaller members of the category perform at a lower level than the other members of the group. These regions are deficient in some of the important factors that are thought to influence the competitiveness of large metropolitan regions (Figure 14). By international standards they are small and have less complex economies with fewer opportunities for higher skill workers. Several are less well connected in terms of major roads and access to an airport. Most do not have any indigenous research capacity in the form of a university and they are not well connected to major financial markets.

Figure 14 provides a sense of the local environment that these larger urbanized regions will have to construct in order to be prosperous. Clearly those regions that are provincial capitals have a clear advantage in this process because they capture important higher order functions and the associated workforce skills associated with this level of government. One of the indirect benefits of being a provincial capital is the presence of a large enough university to have significant research capability. Similarly provincial government locations also tend to have associated amenities in the form of public spaces and cultural facilities that similar sized non-capital regions lack.

For the most part, the regions in this category have the internal capacity to develop an internal strategy that is driven by local resources. This is the inherent logic of an endogenous growth process. However, for the small members of the group, especially those with low levels of productivity and a declining labor force, a major concern will be not dropping down to the next lower level category. The break point between the two types of region occurs when there is about 40,000 in population. Around this population level there seems to be a distinct shift: in the types of economic activity and the associated workforce skills, in the rate of population change, and in the ability of the urban center to capture inward commuting flows from the hinterland. If the urban center becomes weaker there is a tendency for more distant commuters to be attracted to alternative employment opportunities and the functional region shrinks in size.

Figure 14: Factors Influencing Regional Competitiveness

2-31

A Study on the Factors of Regional Competitiveness

TABLE 2.8: OVERVIEW OF REGIONAL FACTORS OF COMPETITIVENESS		
Infrastructure & accessibility	Human resources	Productive environment
<ul style="list-style-type: none"> • <i>Basic Infrastructure</i> <ul style="list-style-type: none"> - road - rail - air - property • <i>Technological Infrastructure</i> <ul style="list-style-type: none"> - ict - telecoms - internet • <i>Knowledge infrastructure</i> <ul style="list-style-type: none"> - educational facilities • <i>Quality of Place</i> <ul style="list-style-type: none"> - housing - natural surroundings - cultural amenities - safety 	<ul style="list-style-type: none"> • <i>Demographic trends</i> <ul style="list-style-type: none"> - migration of skilled workers - diversity • <i>High skilled workforce</i> <ul style="list-style-type: none"> - knowledge-intensive skills 	<ul style="list-style-type: none"> • <i>Entrepreneurial Culture</i> <ul style="list-style-type: none"> - low barriers to entry - risk taking culture • <i>Sectoral Concentrations</i> <ul style="list-style-type: none"> - balance / dependency - employment concentration - high value-added activities • <i>Internationalisation</i> <ul style="list-style-type: none"> - exports/global sales - investment - business culture - nature of FDI • <i>Innovation</i> <ul style="list-style-type: none"> - patents - R&D levels - research institutes and universities - linkages between companies and research • <i>Governance and institutional capacity</i> • <i>Capital availability</i> • <i>Specialisation</i> • <i>Nature of competition</i>

Source: Gardner, Martin and Tyler, 2004

Regions Centered on Small Cities and Regional Towns

The regions in this category also perform important economic functions in Atlantic Canada that extend beyond their boundaries. This reflects their role as secondary providers of goods and services to other smaller regions. While the largest urban regions in Atlantic Canada have the potential for endogenous growth, this is not the case for these smaller city and town based regions. Growth in these regions comes largely from three factors. The first determinant of growth is the capability of the local economy to provide goods and services to export markets, broadly defined. Some regions in the category have very strong primary resource sectors including first stage processing. For these regions the fate of their export sector is crucial in determining future growth conditions.

Second is the general level of economic and demographic condition in the surrounding regions. Because a considerable part of the local economy of regions centered on small cities and regional towns depends on demand for goods and services by firms and households in adjacent regions, the level of prosperity and population levels in these nearby regions alters the economic conditions in the small city and market town regions. The third exogenous factor influencing economic conditions is decisions by provinces about the location of key public service facilities, like schools and hospitals. Provinces establish

administrative service areas for essential public services and invest in major facilities to provide them. Typically the urban centers in regions in this category are prime locations. These facilities create additional direct jobs and income in the host location. Being selected as the site for a major regional hospital can greatly stimulate economic growth not just from the direct jobs, but because the regions is more likely to attract additional retail establishments that sell their goods to people within the service area visiting the hospital.

Productivity measured in terms of GDP per worker is highest in the resource based regions, especially those based on mining, but productivity measured by average wages is far less variable. This shows that workers, and the region, only capture a portion of the value of the output. A high level of industrial diversity means that most of the jobs in these regions have a relatively high share of full time workers, fairly strong workforce participation rates and are not seasonably dependent. A problem for most of these regions is the relatively low rate of new firm formation which suggests that the local economies are not identifying many new growth opportunities. Part of this reflects declining or slow population growth rates both in these regions but more importantly in adjacent smaller regions.

First Order Rural Regions

These are the largest of the regions that mainly have a self-contained local economy, other than the export of raw or semi-processed materials. Notably they play only a minor role in providing goods and services to adjacent smaller regions, except in unusual circumstances. Thus the economic development of these regions largely hinges upon what happens in terms of their local economy. In these regions there is a relatively high reliance on one or two firms/sectors that act as economic engines to drive the rest of the local economy. In most cases these are primary industries, some of which are highly seasonal.

The retail and service sectors are mostly focused on serving local demand and industrial diversity declines steadily as the population falls in the category. But there are important exceptions when the region is distant from any higher order region and becomes a hub for even smaller regions. It may be the only location with a hospital or high school for a long distance and this gives it a larger geographic influence. In these instances of higher order government services there is a clear bump in productivity and average income. More generally productivity is on average lower than in the two urban classes, but, where a high value primary resource is present, very high levels of productivity are observed. For most of these regions productivity increased slowly between 2003 and 2007.

These regions have reasonably strong labor force participation rates, although average populations are declining, and in some cases declining quickly. New firm formation is positive in only a few regions. Seasonal employment becomes more common and average weeks worked can be low in those regions specialized in a seasonal activity, like agriculture, fishing or tourism.

Second Order Rural Regions

The regions in this category consist of three or more CSDs and it is the smallest category that has meaningful commuting flows. Even though these regions form local labor markets, they are for the most part relatively weak local economies. This largely reflects their low population and the limited number and size of activities they are able to undertake. Notably, in some cases there are high levels of productivity in per capita terms, but these are strictly a function of a small high value sector that has limited growth potential. In these cases, the region may be able to maintain its current level of activity but will have difficulty growing unless a completely new high growth sector is identified.

More commonly, the regional economy faces steady decline, largely driven by shrinking populations and an inability to identify new economic functions. Only a few of the regions in the category are growing in terms of population. Seasonal work is quite common and average weeks worked clusters around 25 weeks. Labor force participation rates are about 50% on average, suggesting a lack of opportunity and

limited incentives for out-migration among those capable of work. Not surprisingly, dependence on the primary sector is higher on average than in the previous categories, although there are some regions with very weak connections to the primary sector.

While these are typically specialized economies with limited opportunities for diversification they can have relatively high productivity. Where the region centers on a single community with a strong mining or energy sector both GDP per capita and average wages can exceed levels in the metropolitan regions. More typically a surplus of labor leads to relatively low average wages. Productivity is also limited by low levels of human capital and small scale production. New business starts are rare in most regions but there is a significant share of regions with enough new starts to make a significant percentage change in the number of firms.

Third Order Rural Regions

This category contains the largest number of regions and they are found only in two provinces, Newfoundland and Labrador, and New Brunswick. Because each region consists of either a single CSD or a pair of CSDs, the local population and local economy are tiny. A considerable number of the regions in this category are reserves and they differ significantly from other Third Order Rural Regions. As autonomous nations reserves have a distinct governance structure and sources of support not available to other regions. They also tend to have high birth rates but relatively small employment opportunities. Policy for reserves is highly specialized and outside the scope of our expertise so we focus on non-reserve regions

Third Order regions are, by definition, not connected to any other labor market, yet their best opportunity for viability is to connect to some other region in order to be part of a larger labor force and local economy. As isolated labor markets they are almost certain to disappear over time as the local population ages and dies. For many of these regions connectivity is potentially achievable, because many are reasonably close to larger regions. The first question in this case is whether the economy of the nearby region will grow enough to attract workers, and the second is, whether the cost of commuting will be low enough to link the two regions. In both cases, there is relatively little that the region can do to improve the chances of connecting.

In other cases the region is clearly isolated and far from any larger region, so there is no potential for linking. These regions fall into two groups. The smaller group is made up of regions with relatively high labor force participation rates and with a relatively high number of average weeks worked. In these regions there seems to be at least one significant source of employment, even though it is small, that has high enough productivity that is strong enough to keep the region economically viable at its current level. In these cases there is some site specific resource that is valuable enough to justify a community. Notably even in these cases the region is too small to have many local services, either private or public, so these have to be obtained outside the regions. The larger group in the category is made up of regions with very weak employment opportunity, low participation rates and mainly seasonal work that provides low average wages. Population decline is endemic in this group.

Fostering Development at the Regional Level

The five types of region require different policy approaches because their conditions and opportunities are different. Dealing with this reality requires that government take its existing suite of policies and develop five subsets that target specific combinations of policy to each element of the urban hierarchy. This approach can provide a region with appropriate support without imposing large costs on the government of designing and delivering unique policy responses to every region.

Notably, we believe that in terms of pure economic development policy, the government should focus its efforts on the three middle categories. The large urban regions already have significant internal development capacity and each of the eleven members has an almost unique situation in terms of problems and opportunities. These regions are to a significant degree capable of at least some endogenous growth based on their own capability. This makes it virtually impossible to design a single policy strategy. Third Order Rural Regions offer limited opportunities for policy intervention for almost opposite reasons. In many cases there are no meaningful opportunities for economic growth. Moreover, in these regions there is little local government capacity to partner with. If growth occurs it is most likely to be idiosyncratic and driven by a single firm that identifies a specific opportunity. Finally while there are large numbers of Third Order Rural Regions, they are all very small, which makes it expensive to deliver any policy support.

By contrast the three medium size categories: Small Cities and Regional Towns, First Order Rural and Second Order Rural Regions, all contain a significant number of members having a relatively high degree of homogeneity. Moreover, these regions have large enough economies and populations that they can support growth, especially if it fosters further integration within and across regions. Local government in these regions lacks the resources to act strategically but has the capacity to partner with federal and provincial agencies. This capacity is crucial if federal and provincial agencies are to support development efforts rather than actually carry them out.

Importantly, by providing a suite of supports tailored to different needs and capabilities of regions of different size, government avoids the problem of picking winners. Regions with similar needs are offered similar support. Some will choose to take the support, others may not. Some that take the support will succeed, in part because of that assistance, but others will not. Federal and provincial governments are in essence betting on the pool of regions, and not on individual regions. Competition among regions is inevitable and growth cannot occur in all regions. What policy can do is level the playing field so that all regions have the opportunity to compete within the appropriate bracket.

Figure 15 provides a matrix showing types of policy support by position in the urban hierarchy. Some forms of support apply to all regions while others are restricted to a single rank in the hierarchy. The intent is to provide policy support that is tailored to the types of problem and opportunity most common in each level of the hierarchy. Clearly these are somewhat generic policies, but within a category each region can pick specific elements that are most useful to it. The types of support are indicative and not necessarily the best sets for each rank. They are intended to provide a starting point for developing actual packages of support based on the idea that regional development policy has to work at the level of specific regions but see these regions within a larger context that places them in an urban hierarchy.

Figure 15: Matrix of Hypothetical Policy Suites by Functional Economic Region Category

Type of Place	Larger Urban	Regional town - high productivity, stable or increasing population	Regional town - low productivity, declining population	Rural 1- high productivity, stable or increasing population	Rural 1- low productivity, stable or declining population	Rural 2 - high productivity, stable or declining population	Rural 2 -low productivity, declining population	Rural 3 - single CSD or 2 CSDs
Synopsis of conditions	Good to fair economic conditions, largely competitive and with stable to growing populations, presence of major public infrastructure	Places that are experiencing stable economic activity or modest growth. Often in a larger region that is economically prosperous	Towns that have weak economic functions. Main role may be a regional service center in a declining larger region.	small specialized economies with strong export industry. economy viability depends on maintaining or expanding this export base	small specialized economies with weak export industry. Current export base needs revitalization or replacement	highly truncated economies, but with one firm that is competitive by Atlantic Canada standards. Firm may be replacing workers with capital to remain viable	highly truncated economies, but with weak export potential. In clear danger of disappearing	very small places, low populations, some have a viable firm/sector, but most do not. Very few opportunities for growth and these depend on individual firms. Little , if any, local capacity to lead development
Number of Regions	11	5	24	5	26	9	30	149
Main Policy Objectives	Strengthen local economy by improving economic performance. Support regional innovation systems where possible. Support workforce skill development. Encourage agglomeration effects to support endogenous growth	Expand spatial reach of central place by improving connectivity. Support supply chain development. Tailored workforce skills. Support for new firms and new products/processes. Support for entrepreneurs.	Help identify new activities that can improve competitiveness. Strong business retention and expansion activity. Support for filling well defined infrastructure gaps. If necessary help in downsizing to a smaller size/function. Support for entrepreneurs.	Support for leading firms to increase productivity. Add supply chain links where possible. Identify new opportunities, but being careful not to harm existing firms. Support for entrepreneurs.	Try to revitalize leading firm and/or search for new opportunity. Limited subsidies for existing firm may be needed. Search for new administrative or public service delivery functions. Support for entrepreneurs.	Try to match labor supply to firm needs, but support replacement of labor with capital if this maintains productivity. Help firm with marketing and technical knowledge. Support for entrepreneurs.	Try to provide basic services for communities but with low facility investments (mobile services). Support for outmigration of residents. Support for social enterprise. Support for entrepreneurs	Provide support for individual firms, encourage volunteers, provide support for outmigration, ensure access to basic services but without investing in local facilities
Support Regional Innovation Systems	X							
Cluster promotion	X	X						
Firm Based Innovation		X	X	X	X	X	X	
Support Entrepreneurs	X	X	X	X	X	X	X	X
Broad Workforce Training Schemes	X	X						
Community Futures				*	*	*	*	
Tailored Training Schemes		X	X	X	X	X		
Business Retentions & Expansion		X	X	X	X	X		
Strengthen Supply Chain Links	X	X	X	X				
Road improvements			X	X	X			
Broadband					X	X	X	X
Incentives for local government collaboration				X	X	X		
Mobile Service Delivery						X	X	
Wage Subsidies (seasonal E! etc.)						X	X	X
Labor market matching efforts			X	X	X	X		
Support for Outmigration						X	X	X
Support for firm specific investment		X	X	X				
Shared Public Services		X	X	X	X			X
Support for volunteers to provide services				X	X	X	X	X
Support for Social Enterprise				X	X	X	X	

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