Rural Canada in the Knowledge-Based Economy

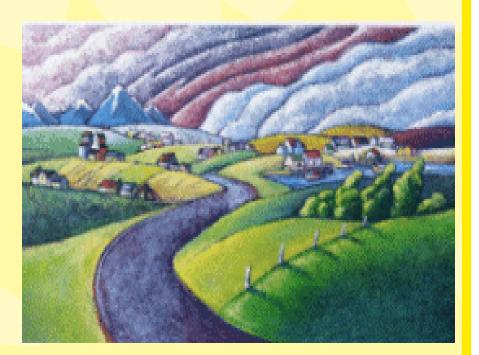
Introduction

The Canadian economy is fast becoming a knowledge-based economy (KBE). This report provides a profile of rural Canada and assesses its degree of integration into the KBE. Rural Canada is examined along dimensions important to the KBE such as human capital, connectedness and innovation.

This report was developed in consultation with the Rural Secretariat, which is a focal point for rural policy development and for other federal rural activities.

What do we mean by rural Canada?

- No universal definition for "rural" exists.
- Some would argue that the most significant benefits of the Knowledge-Based Economy (KBE) can be realized only in very large urban centres. Everything outside the commuting zone of metropolitan centres could be considered "rural" in that sense.
- People in low population areas face additional challenges, so a low population threshold could also be used to define "rural".



Definitions used in this report:

METRO: Metropolitan areas (based on Statistics Canada's Census Metropolitan Areas, or CMAs). These are centres with a population of 100,000 or more and their surrounding commuting zones.

NON-METRO: all areas which fall outside of this definition.

This can be broken into:

SMALL CITIES: areas with a population of at least 10,000 which fall outside the definition of METRO. These are Statistic Canada's Census Agglomerations, or CAs.

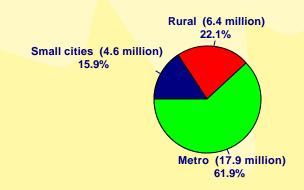
RURAL: areas with a population of less than 10,000 which are outside of commuting zones for small cities or CMAs.

A profile of rural Canada

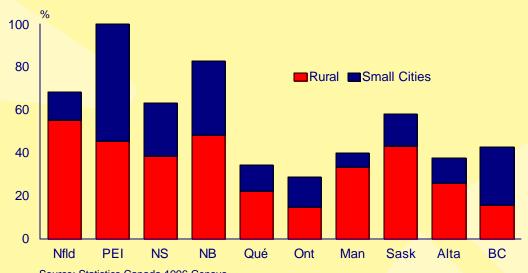
Rural Canada is large...

- 6.4 million Canadians live in rural areas. A further 4.6 million live in small cities.
- Rural/urban distribution varies across provinces.
 - The Atlantic provinces and Saskatchewan are the most rural.
 - While Ontario and Quebec are mostly urban, they account for about half of Canada's rural population -- 3.2 million.

Population shares, 1996



Rural and small cities population shares, 1996



...and growing...

- Canada's rural population is growing but generally more slowly than in Canada's urban centres.
- The share of non-metro population has been steadily declining over the last decades.

Population Growth 1991-1996



Non-Metro share of population



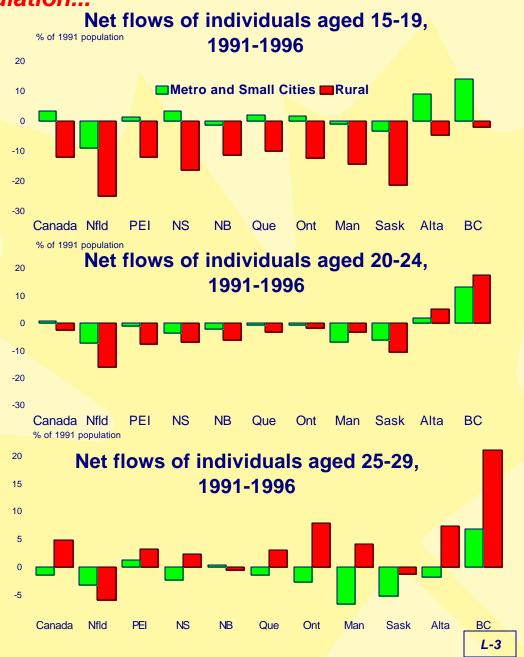
Source: Statistics Canada 1996 Census and Canada Year Book, various issues

...with a highly mobile youth population...

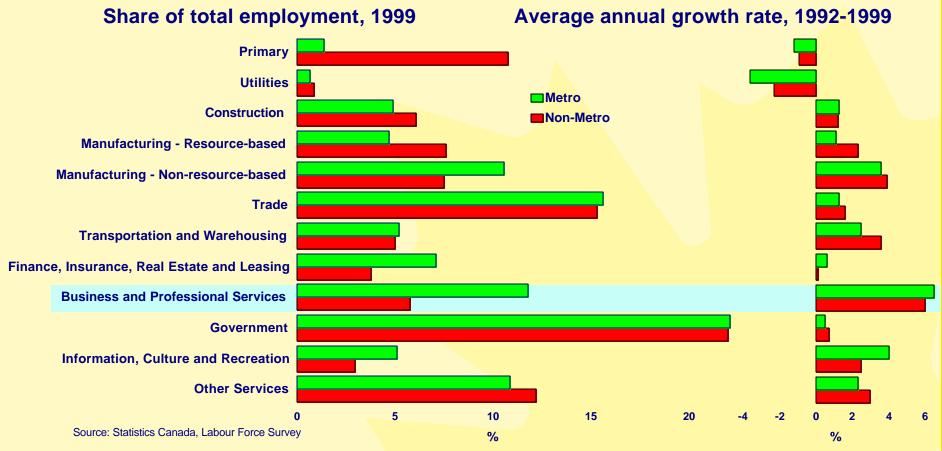
- From 1991 to 1996, rural communities in all provinces experienced a net loss of youths aged 15 to 19. The most substantial losses were in Saskatchewan and Newfoundland.
- Only rural Alberta and BC had net increases of individuals aged 20 to 24.
- In most provinces, rural areas had net gains of individuals aged 25 to 29.
- A study on population flows over a much longer period (1971-1996) confirms a net exodus from rural areas in all provinces of those who were under 19 years of age in 1971.

Overall, Atlantic provinces and Saskatchewan seem to face the greatest challenge in retaining rural youth.

Source: 1991-96 Tax Data (from Dupuy, Mayer, and Morissette, 2000), and Census of Population 1971 and 1996 (from Tremblay, 2001).





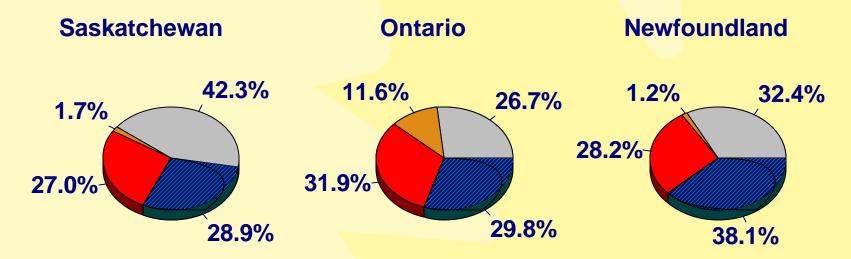


- Non-metro employment is diversified, but more heavily concentrated in the primary, resource-based manufacturing and construction sectors than is metro employment. These industries have had slow growth over the 90's.
- Business and professional services, finance and real estate and non-resource-based manufacturing account for a relatively larger share of metro employment. The largest gap is in business and professional services, the fastest growing sector.

...with considerable variation across regions

Rural Employment by industrial sector, 1999

- Resource (Manufacturing, Primary, Construction)
- Manufacturing Non-resource-based
- Commercial Services
- Government (inc educ. and health)



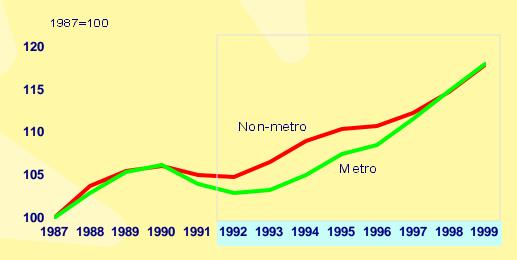
Source: Statistics Canada, Labour Force Survey

- Industrial concentrations vary across provinces.
- Resource industries account for a higher share of employment in western provinces, particularly Saskatchewan. Central Canada has the highest incidence of employment in non-resource based manufacturing. Eastern provinces have a relatively large share of employment in government.

Employment is less cyclical in non-metro areas...

- Non-metro areas have generally been less affected by recent recessions.
- Almost 70% of job creation since 1992 has occurred in metro areas, but growth rates varied across provinces.

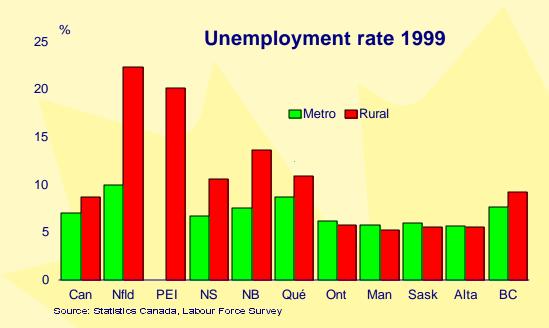
Canada's employment growth, 1987-1999



Source: Statistics Canada, Labour Force Survey

...and unemployment is higher and more stable

- In 1999, rural areas had a higher unemployment rate at the national level (8.7%, compared with 7% in metro areas).
- In Atlantic Canada,
 Quebec and British
 Columbia,
 unemployment rates are
 higher in rural areas.
 Rural unemployment
 rates in Ontario and in
 the Prairies are slightly
 lower.
- The unemployment rate gap between metro and non-metro areas tends to narrow during recessions and to widen in expansion periods.



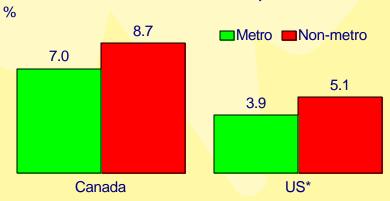


*As the CMA / non-CMA breakdown is not available for data prior 1987, the metro / non-metro rates are represented by Self-Representing Unit (SRU) and Non-SRU, concepts which corresponds closely with our definitions of CMA / non-CMA. Source: Statistics Canada (Labour Force Survey)

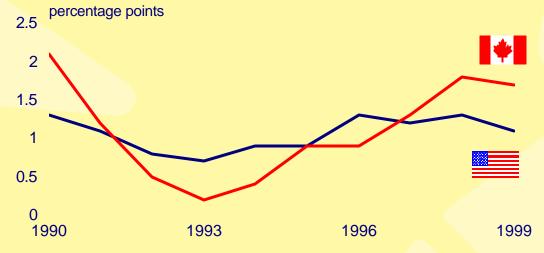
Non-metro unemployment rates are also higher than in the U.S.

- Unemployment rates are higher in Canada than in the U.S. -- in both metro and non-metro areas.
- In 1999, Canada's non-metro unemployment rate was 1.7 percentage points above the metro rate, compared to a gap of 1.2 points in the U.S.
- The metro-non-metro unemployment gap is not always higher in Canada. It tends to be higher in expansions, smaller in recessions.
 - U.S. metro non-metro gap is more stable.

Unemployment rate, Metro and Non-Metro, Canada vs U.S.,1999



Unemployment rate gap Non-Metro - Metro



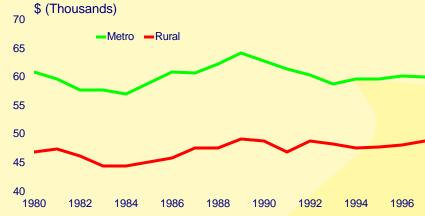
Source: Statistics Canada, Labour Force Survey and USDA, Rural Conditions and Trends, vol 11,no 2.

Metro areas are defined as those containing core counties with one or more central cities of at least 50,000 residents or with a Census Bureau-defined urbanized area (i.e. densely settled area) and a total metro area population of at least 100,000. As in the Canadian definition, adjacent counties which are economically integrated to the core counties are also included in the definition of Metro.

Incomes are lower in rural Canada...

- The rural-urban income gap is smallest in British Columbia and Alberta.
- The gap has been relatively constant over the last two decades.
- Government transfer payments represent a larger source of income for rural Canadians.

Average incomes for 2+ families, (1996 dollars) Canada

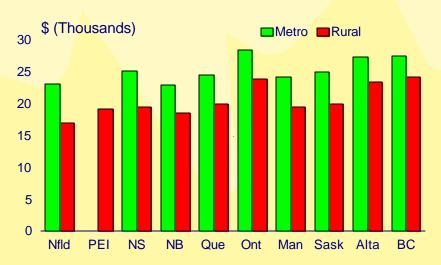


*The definition of "rural" here refers to individuals living outside centres of 1,000 or more and who live outside the commuting zones of urban centres of 10,000 or more. "Metro" describes individuals living in areas with a population of 100,000 or more. These definitions correspond very closely with those used elsewhere in this report.

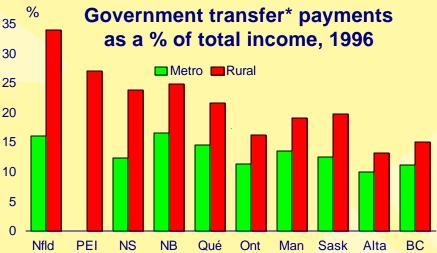
Source: Rupnik, Carlo, Margaret Thompson-James and Ray Bollman, 2001

Measuring Economic Well-Being of Rural Canadians Using Income Indicators

Average income of population 15 years and over*, 1996



*average income of persons aged 15+ who declared an income in 1995. Source: 1996 Census of Population, Statistics Canada



*refers to total income from all social transfer payments received from federal, provincial or municipal governments.

Source: Statistics Canada, 1996 Census

L-9

...but so are rural living costs

Low income cut-offs (LICO) are used to delineate families and unattached individuals into low income and other groups.

A LICO is an income threshold* below which a family will likely devote a larger share of its income to the necessities of food, shelter and clothing than would an average family.

- The proportion of the population living below the low income cut-off is significantly higher in metro areas.
- Furthermore, evidence** shows that income is more equally distributed within rural areas.

Low income after tax cut-offs, 1998* (annual income, in \$)

	Size of area of residence (in thousands)					
	500+	100-499	30-99	10-30	<10	
1 person	14,510	12,223	12,034	10,995	9,514	
2 person	17,705	14,913	14,682	13,418	11,608	
3 person	22,392	18,863	18,571	16,970	14,681	
4 person	27,890	23,493	23,129	21,136	18,285	

^{* 1992} base

Source: Statistics Canada, Catalogue 13F0019XPB

Share of population with low income, 1998



Source: Statistics Canada, Survey of Labor and Income Dynamics, 1998

*Thresholds are based on 1992 family expenditure data, which indicated that Canadian families spent, on average, 44% of after-tax income on basic necessities. Statistics Canada estimated that families spending 64% of their after-tax income on these basic necessities would be in straitened circumstances. With this assumption, low-income cut-offs were established for seven different sizes of families and five urbanization categories. Cut-offs have been adjusted by changes in the Consumer Price Index.

**Rupnik, Thompson-James and Bollman, (2001) show that the Gini coefficient was 0.39 in rural areas compared to 0.43 in urban centers. A difference of 0.01 or more between two Gini coefficients is considered statistically significant.

The Knowledge-Based Economy

What does it take to succeed in the KBE?

The next section examines how rural Canada is doing in terms of education, training, connectedness, and innovation

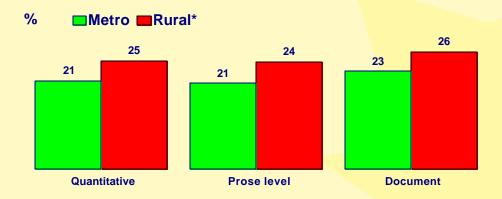
These factors are related to success in the KBE

Education

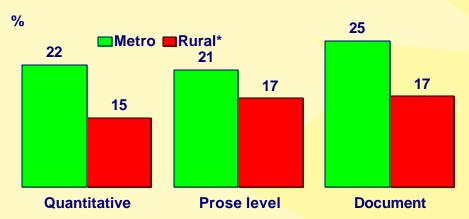
Rural Canada has lower literacy

IALS Canada 1997

Share of population at level 1 (lowest level), difficulty reading and using basic written instructions



Share of population at level 4 or 5 command of higher-order information processing skills



*Defined in this survey as areas with populations up to 15,000. The definition for Metropolitan in this survey is consistent who those used in other sections of the report.

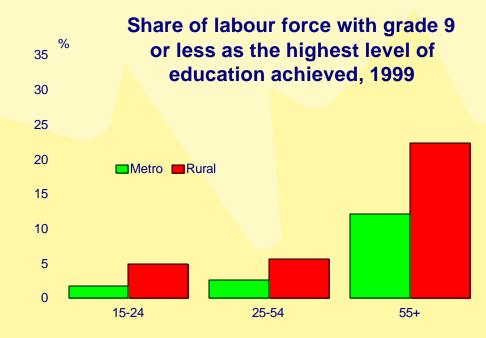
Source: IC calculations based on Statistics Canada data (IALS)

- Rural regions have a larger proportion of adults with very low literacy skills.
- Rural regions also have a relatively low proportion of adults at the highest level of literacy.

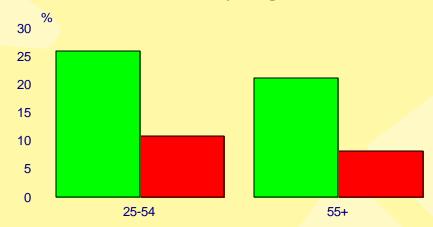
The International Adult literacy Survey (IALS) measures three domains of literacy skills among the adult population: prose (text), document (such as maps, payroll forms, transportation schedules) and quantitative (basic numeracy, such as balancing a chequebook).

Rural / urban education gaps exist at all age groups

- On average, Canadians in rural areas are less educated than those in metro areas.
 - Rural Canada's population tends to be older. Since an older population tends to be less educated, this may explain some of the rural-metro education gap.
 - However, it is not the sole factor. Education gaps are pronounced in all age groups.
- Educational attainment is higher among the young in both rural and urban areas.

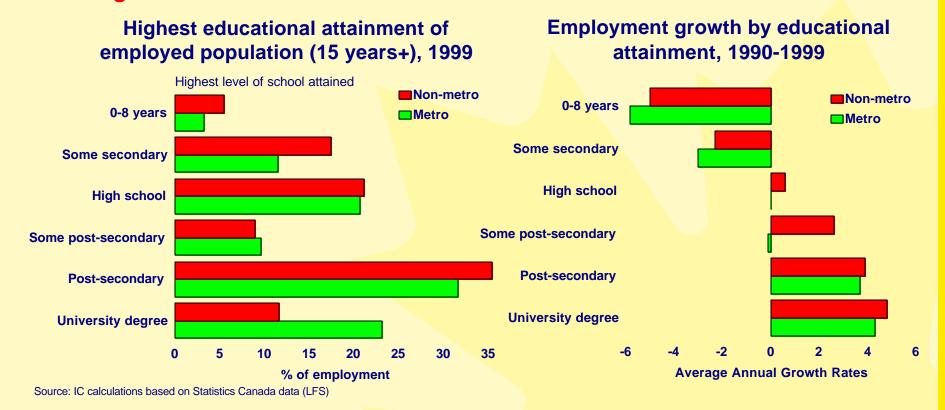


Share of labour force with a university degree, 1999



Source: IC calculations based on Statistics Canada data (LFS)

Both metro and non-metro employment is becoming more knowledge-intensive...

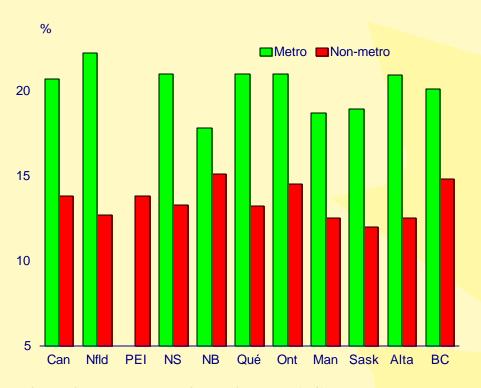


- Employment growth among the highly educated has been somewhat faster in non-metro areas than in metro areas.
- Still, non-metro Canada has a much smaller share of workers with a university degree and a larger share of workers with less than high school graduation.
 - Job growth trends over the 1990-99 period demonstrate the influence of education on employment. Employment growth was faster for those with university and post- secondary education.

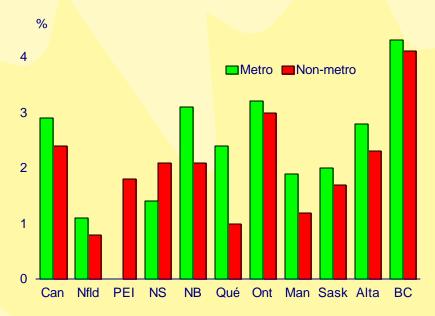
...but non-metro has fewer knowledge and management workers

Knowledge and senior management occupations as a share of labour force, 1999

Labour force growth of knowledge and senior management occupations, (1987-1999)



Source: IC calculations based on Statistics Canada data (LFS) and occupational classification system based on M. Lavoie and R. Roy, "Employment in the Knowledge-Based Economy: A Growth Accounting Exercise for Canada", HRDC, 1998. Annex B contains a brief summary of this schema.

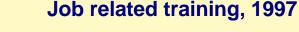


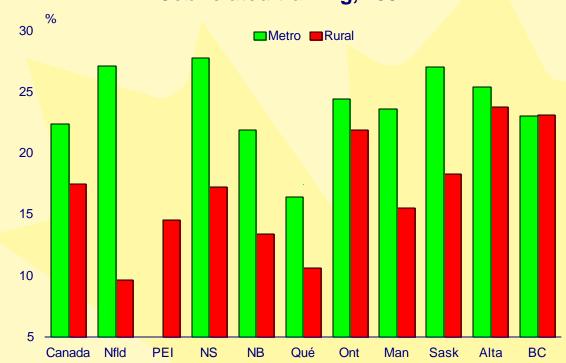
- Metro areas have a larger pool of workers in knowledge and senior management occupations.
- The high-knowledge/ management labour force is increasing in all areas, but at a slower rate in rural Canada.

Training

Training rates are lower in rural Canada...

- Education and training activities play an important role in enhancing skills in the rapidly evolving new economy.
- In all provinces except
 British Columbia, a
 smaller share of rural
 adults took part in a job
 related training activity in
- The urban-rural gap is largest in Newfoundland, New Brunswick, and Nova Scotia.



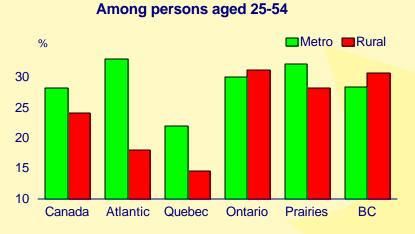


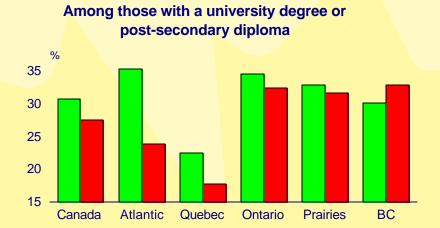
In this analysis, job-related adult education is defined as organized, structured programs of education offered full-time or part-time by public or private institutions, employers or any other providers, that individuals declare they have taken in 1997 "for a current or future job" as the main reason.

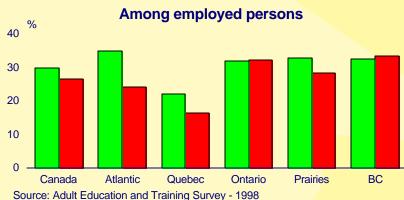
The population is defined as people 17 years of age and older. However, in order to retain a focus on learners no longer in initial education, all full-time students were excluded except those sponsored by an employer, those over the age of 19 enrolled in an elementary or secondary education program and those over the age of 24 enrolled in a post-secondary education program.

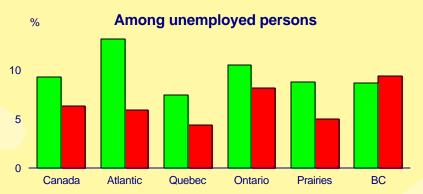
Source: Statistics Canada - Adult Education and Training Survey - 1998

...even after adjusting for age, education, and employment Job related training, 1997









- Training rates among those of working age (25-54) and highly educated individuals display an urban/rural gap in most regions.
- The disparity persists regardless of employment status.

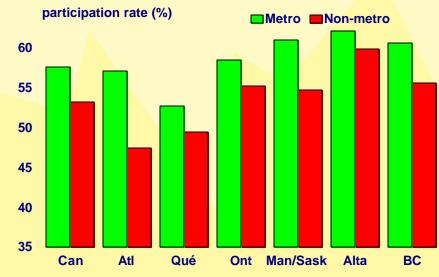
Connectedness

More than half of residents outside of metro areas are using computers

There is a wide gap in computer use in the Atlantic region between metro and non-metro residents.

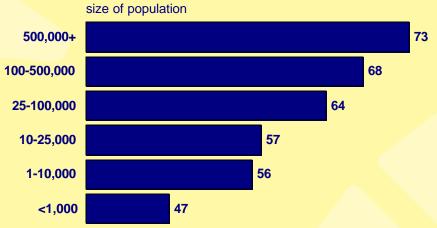
- Elsewhere, the share of residents in non-metro areas using a computer is closer to the urban share.
- The urban-rural gap can be large, however, for very small communities.
 - A person coming from a city of at least 500,000 people is roughly 1.5 times as likely to have used a computer in the last three months as someone coming from a town with a population of less than 1,000.

Computer use, 1998



Source: General Social Survey, Statistics Canada, 1998

Computer use by population size, 1998



% using PC in past three months

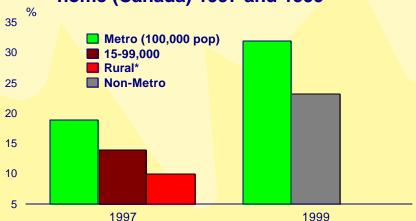
Source: Ekos' Information Highway and the Canadian Communications Household, 1999

Rural residents are more and more connected

The Household Internet Use Survey is the most recent survey of its size and scope in Canada. It counts regular-use households as those that responded yes to the question: "In a typical month, does anyone in the household use the Internet?"

- Use of the internet is increasing in rural and urban areas. But there is little evidence that the urban/rural gap is widening.
- The urban-rural gap in internet usage is larger than the gap in overall computer use. This is true in every region.
 - The vast majority of Canadians can gain access to the Internet through basic telephone services.
 However, high speed access may be an issue for Rural Canada.

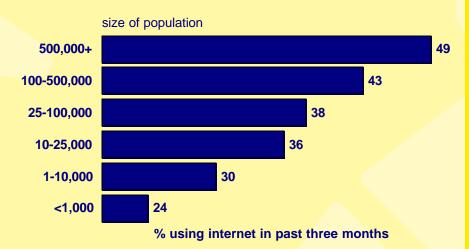
Regular use of the internet from home (Canada) 1997 and 1999



*in the 1997 survey, rural denotes population outside CAs/CMAs that fits Census definition of Rural

Source: Household Internet Use Survey, 1999

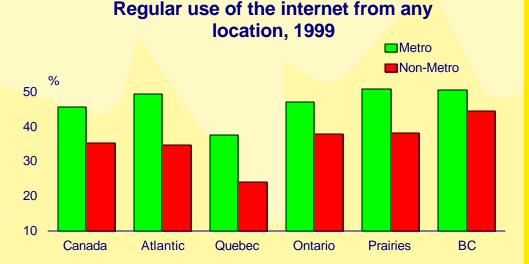
Internet use by population size, 1998



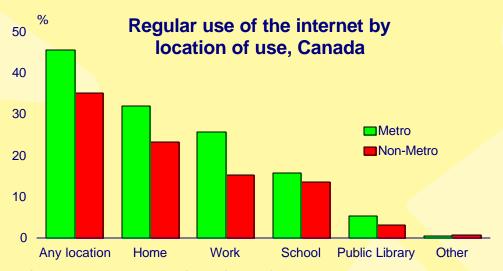
Source: Ekos' Information Highway and the Canadian Communications Household, 1999

The usage gap is largest for work and home sites...

- Individuals living outside metro areas are less likely to be regular users of the Internet from any location.
 - Again, the disparities are greatest in the Atlantic, Quebec, and the Prairies.
- The metro / non-metro gap is much wider in work and home usage than for schools, public libraries, and other locations.



Source: Household Internet Use Survey, Statistics Canada, 1999

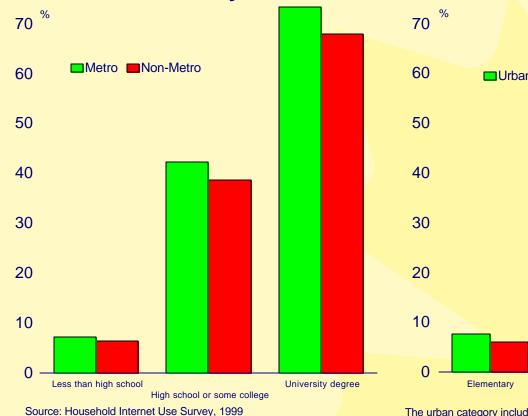


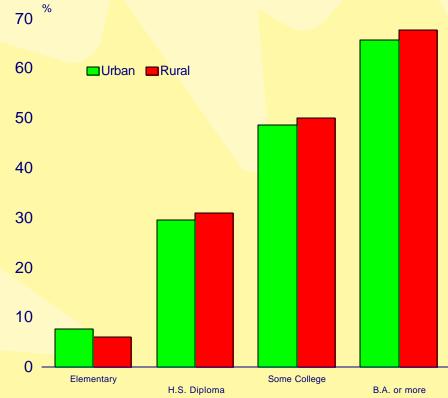
Source: Household Internet Use Survey, Statistics Canada 1999

...and education is a major determinant

Regular internet use by education Canada, from any location, 1999

Percent of U.S. households with internet by education, 2000





The urban category includes those areas of a population density of at least 1,000 per square mile and a total population of at least 50,000 as well as cities, villages, boroughs, towns and other designated census areas having 2,500 or more persons. Rural areas generally include places of less than 2,500 persons.

Source: National Telecommunications and Information Administration and ESA, U.S. Department of Commerce, using August 2000 U.S. Bureau of the Census Current Population Survey

- Education is an important factor explaining internet use in both Canada and the U.S.
- Unlike in Canada, the urban/rural gap in the U.S. is reversed at higher education levels.

Innovation

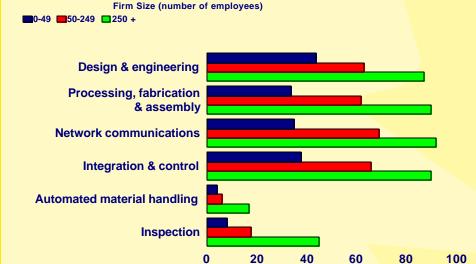
Data on innovative activity in rural Canada are scant

- Innovation is recognized as a key driver of productivity gains and economic growth. Because of its complexity, however, the innovative process is not easily quantified.
- Assessing the amount of innovative activity taking place in rural Canada is complicated by the absence of data that would allow comparisons of innovative performance between urban and rural firms.
- One can only draw inferences based on the characteristics of firms in urban and rural areas.

Small size of rural firms may be a barrier to technology adoption...

Technology adoption, an important channel by which firms benefit from innovation, tends to increase with firm size.

Advanced technology adoption by firm size, 1998



Businesses by employee size, 1999

Firm Size	Rural	Non-Metro	Metro
1-49	97.5%	96.8%	94.6%
50-199	2.2%	2.7%	4.5%
200+	0.3%	0.5%	0.9%

Source: Business Register

Source: Survey of Advanced Technology in Canadian Manufacturing, 1998

A potential source of disadvantage for rural Canada is the smaller size of its firms.

% of Firms Adopting Advanced Technologies

Firms in metro areas are three times as likely as those in rural areas to be large (200 employees and over) and twice as likely to be medium sized (between 50 and 199 employees).

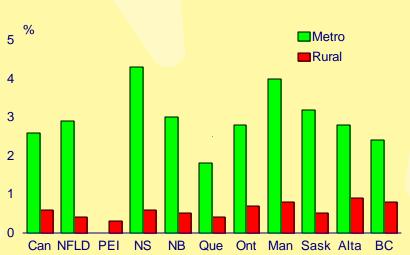
...as may their lower degree of foreign control...

Adoption rates are also generally higher in foreign-owned firms than in domestically owned firms. Foreign-subsidiaries can therefore be an important channel for the adoption of world-class technologies.

Technology adoption by control, 1998



Rate of foreign control, 1999



% of Firms Adopting Advanced Technologies

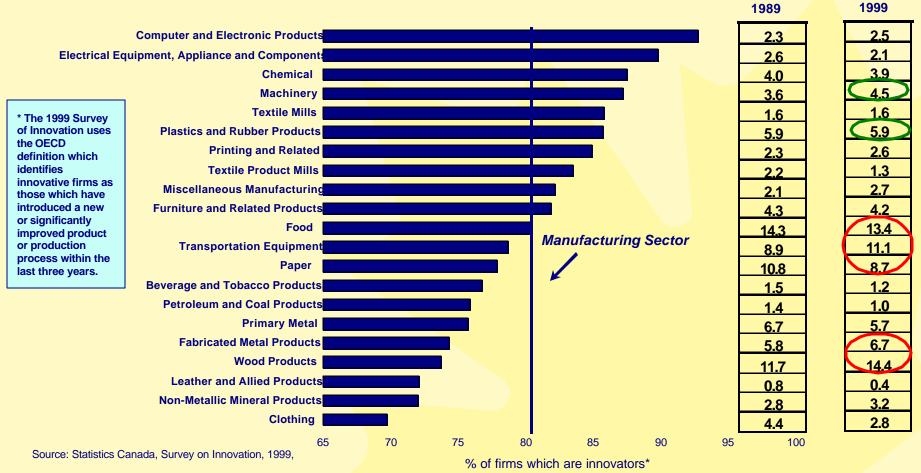
Source: Survey of Advanced Technology in Canadian Manufacturing, 1998

 Rural firms have less of an opportunity to benefit from this technology transmission channel, as foreign-controlled firms are largely concentrated in metro areas.





Share of Mfg employment, Non-Metro



- Rural firms are concentrated in less innovative industries. For example, firms engaged in wood
 product, paper and food manufacturing are generally less innovative than computer and electronic
 equipment firms.
- But rural activities are significant in some of the most innovative sectors, i.e. plastics and rubber and machinery.

Conclusion

Rural Canada and the KBE - Concluding remarks

- Rural Canada, like its urban counterpart, is more and more involved in the KBE
 - employment in high-knowledge occupations growing fast
 - workforce increasingly educated
 - computer and internet use on the rise
- But Rural Canada lags behind in some key areas
 - education, training, connectedness and likely innovation
 - some gaps are linked to heavier reliance on location-dependent resource industries
- In recent years, the Federal Government has increased its focus on rural Canada and has introduced measures to address rural concerns, and to facilitate the transition to the Knowledge-Based Economy.

National programs address many of rural Canada's challenges...

- Enhancing the economic capacity of rural communities
 - Community Business Development Corporations (CBDCs) and Community Futures
 Development Corporations (CFDCs) support small and rural communities across Canada.
- Providing assistance to small businesses
 - The Business Development Bank of Canada
 - The Industrial Research Assistance Program

The Guide to Government of Canada Services and Support for Small Business describes these in detail.

- Strengthening Human Capital
 - National Literacy Initiative (SFT)
 - Registered Individual Learning Accounts
 - Canada Education Savings Grants and Canada Study Grants
 - Canada Millennium Scholarships

...and specific rural concerns are being targeted...

In response to the House of Commons Standing Committee on Natural Resources *Think Rural* report, in 1998 the Government earmarked \$20 million over four years for the Canadian Rural Partnership (CRP) Initiative to support rural community development through a cross-departmental approach.

- This initiative requires the application of a rural lens - all new policies and programs must be assessed for their impact on rural Canada
- It supports an ongoing Rural Dialogue as well as specific community-based projects (138 in 1998-2000) under the Pilot Project Initiative



- Think Rural Report, 1997
- Appointment of Minister Coordinating Rural Affairs, 1998
- Canadian Rural Partnership Initiative, 1998
 - Rural Lens
 - Pilot Project Initiative
 - Rural Dialogue
- Federal Framework for Action in Rural Canada, 1999
- Appointment of Secretary of State for Rural Development, 1999
- First Annual Report to Parliament, 2000

...including access to the information highway

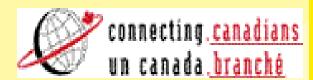
 Under the Community Access Program, the Government has established public Internet access sites in thousands of rural and remote communities.



 SchoolNet has worked with the provinces and businesses to connect all of its schools and libraries to the Information Highway. First Nations SchoolNet gives schools an affordable, high-speed connection to the Internet via Direct PC satellite terminals.



- On October 16, 2000, the Minister of Industry announced a National Broadband Task Force to advise the Government of Canada on how to best make high-speed broadband Internet services available to businesses and residents in all Canadian communities by the year 2004.
 - The Task Force is to consider the needs and characteristics of communities, which without government involvement will not likely gain access to private sector-delivered high-speed services.



Annex A: Data Sources

- The definition for rural used in this report was selected in part because it allows the use of a wide range of data sources in this report.
- In contrast, definitions based on population density, such as Census "Rural Areas"
 (populations living outside places of 1,000+ people or living outside places with densities
 of 400+ people per square kilometre) or the OECD's "Predominantly Rural Regions"
 (populations in regions where more than 50 percent of the people live in a community less
 than 150 people per square kilometre) would preclude the use of most of these sources.
- As data used in this study do not cover the Aboriginal and Far North populations, they
 were not included in this analysis.

Survey	Survey type	Sample Size
Labour Force Survey, 1999 (Statistics Canada)	Household survey	53,948
Business Register, 1999 linked to CALURA database (Statistics Canada)	Administrative data from Revenue Canada Business Number Account	all significant business entities in Canada
Household Internet Use Survey, 1999 (Statistics Canada)	Household survey	36,241
Census of Population, 1996 (Statistics Canada)	Household survey	All households, or 20% sample
General Social Survey, 1998 (Statistics Canada)	Household survey	10,749
Ekos Survey, 1999 (Ekos Research Associates)	Telephone survey	3,522
Adult Education and Training Survey, 1998 (Statistics Canada)	Household survey	approx. 42,600
International Adult Literacy Survey, 1997 (Statistics Canada)	Household survey	(Canada): 3130 English 1370 French

Annex B: Knowledge and management occupations

- Our classification follows the approach of Lavoie and Roy, which sorts occupations into five categories: knowledge, management, data, services, and goods. Occupations which involve the production of knowledge or the provision of expert opinion are classified as knowledge; those whose tasks are to use knowledge or data are grouped under the data category; those performing personal services are classified as services, and occupations involved in the transformation or processing of materials and physical objects are classified under the goods category.
- Our analysis focuses on the knowledge category, adding occupations within the management category which have been classified as senior, and classifying everything outside this group as "Other". The approach departs somewhat from the Lavoie and Roy classification since the occupational groupings we used were somewhat broader than theirs; some discretion has been exercised in the allocation of categories whose sub-elements do not fit into a single Lavoie and Roy category. These cases are marked with an asterisk.

Knowledge and senior management occupations

Natural and applied sciences and related occupations

Occupations in social science, government service and religion*

Teachers and professors*

Senior management occupations

Professional occupations in business and finance*

Professional occupations in health, nurse supervisors and registered nurses*

Other occupations

Other management occupations

Financial, secretarial and administrative occupations*

Clerical occupations, including supervisors

Technical, assisting and related occupations in health*

Occupations in art, culture, recreation and sport*

Sales and service occupations

Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers

Retail salespersons, sales clerks, cashiers, including retail trade supervisors

Chefs and cooks, and occupations in food and beverage service, including supervisors

Occupation in protective services

Childcare and home support workers

Sales and service occupations n.e.c., including occupations in travel and accommodation, attendants in recreation and sport as well as supervisors

Trades, transport and equipment operators and related occupations

Occupations unique to primary industry

Occupations unique to processing, manufacturing and utilities

Unclassified

M. Lavoie and R. Roy, "Employment in the Knowledge-Based Economy: A Growth Accounting Exercise for Canada", HRDC, 1998

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