BENCHMARKING REPORT – WATERLOO

I.   INTRODUCTION

We conducted an international benchmarking analysis for the members of the Consider Canada City Alliance Inc., consisting of 11 (C11) large Canadian cities or Census Metropolitan Areas (CMAs). This analysis used information from both Canada and the United States which are available in the Local IDEAS database. The database includes an extensive set of social and economic indicators for all the city-regions in both countries.

International benchmarking of cities is generally more complicated than benchmarking within countries. The differences in the definition of indicators and data availability between the two countries imply that the information needed for benchmarking is not necessarily directly comparable. In this analysis, tables of concordance for all the required variables were integrated to the Local IDEAS database to facilitate cross-border comparability.

Benchmarking is one of the effective tools that could be used to provide more meaningful interpretation of data on various indicators available in the city-regions. In benchmarking analysis an appropriate data is created so that more accurate comparisons can be made. For example, if the reported current unemployment rate in the city of Toronto is 8%, with a suitable data or measure to compare to; more precise conclusion regarding its acceptability could be easily deduced. The results of this benchmarking analysis could help local governments generate important assessment of their city's social and economic status, thereby gaining vital information that could lead to improving their performance.

II.   METHOD

The primary source of data used for this benchmarking analysis is the Local IDEAS database which includes data from various government and private agencies in Canada and the United States. The data from Canada were mainly taken from Statistics Canada such as the 2006 Census of Population, Labour Force Survey (2003-2010) and the 2006 Canadian Business Patterns database. For the United States, the data sources include the American Community Survey (2003-2010) and the 2006 County Business Patterns.

The idea behind this benchmarking exercise is to compare each of the CMAs' economic performance against a group of "similar" American Metropolitan Statistical Areas (MSAs). The group of similar MSAs was determined by conducting an analysis which involves developing a set of indicators (population size, human capital, occupational structure and industrial structure) and then using a measure of "distance" or "similarity" to identify the 10 closest neighbours or most similar MSAs for each of the CMAs.

The human capital index includes population characteristics such as educational status; age distribution and immigration status. Information on educational status specifically includes: (1) proportion of individuals with less than High School educational attainment, (2) percentage with at least Bachelor of Science degree, and (3) number of PhDs per 1000. The age distribution of the population includes proportion of individuals: (1) under 18 years old, (2) 18-64 years old and (3) 65 year old and over. For immigration status, we used data on proportion of foreign-born individuals.

The occupational and industrial structures include the set of categories that are comparable in both countries. We identified 14 comparable occupational categories in the National Occupational Classification (NOC) and Standard Occupational Classification (SOC) and 19 comparable industrial classifications in the two-digit level North American Industry Classification System (NAICS). Details of these occupational and industrial groups are shown in Figures 3 and 4, respectively.

Using the group of similar MSAs, a detailed benchmarking analysis was performed on each of the C11 member CMAs. The key variables included as measures of economic performance are employment income, employment growth and unemployment level which may be updated annually depending on data availability.

III. RESULTS

A. Similarity (Nearest Neighbour) Analysis

Presented in Table 1 is the result of the analysis conducted for Waterloo. It contains the ranking of the MSAs based on the individual indicators and the overall index, with the lower numbers indicating "more similar" or "closer" to Waterloo and higher numbers indicating "less similar" or "farther". The overall index is basically the rank of each MSA based on the total score from all the four indicators.

We can see from Table 1 that Reading is Waterloo's closest city-region among the MSAs in the United States as indicated by the computed Overall Index. Among these top 10 MSAs; Winston (3rd) is the most similar to Waterloo in terms of Population Size, Rockford (71st) based on Human Capital, Fort Wayne (5th) based on Occupational Structure, and York (4th) based on Industrial Structure.

Table 1: Top 10 most "similar MSAs" to Waterloo by Overall Index

Metropolitan Statistical Areas		Indicators				Overall Index
		Population Size	Human Capital	Occupational Structure	Industrial Structure	
Reading	PA	25	87	51	13	1
Winston	NC	3	91	57	28	2
Rockford	IL	52	71	28	30	3
Wichita	KS	67	127	19	23	4
Greenville	SC	71	100	16	56	5
Spartanburg	SC	85	120	35	8	6
Greensboro	NC	120	74	40	18	7
South Bend	IN	63	128	25	38	8
Fort Wayne	IN	17	229	5	32	9
York	PA	12	242	54	4	10

Table 2 below shows the top 10 most similar MSAs to Waterloo by indicator. In terms of Population Size, the top 3 closest MSAs to Waterloo are Lansing, Spokane and Winston with population size around 450 thousand. For the Human Capital indicator, Las Vegas ranks the closest while for the Occupational Structure indicator, the closest is Columbus and for Industrial Structure, the closest is Grand Rapids.

Table 2: Top 10 most "similar MSAs" to Waterloo by Indicator

Rank	Population			Human Capital		Occupational Structure		Industrial Structure	
	Waterloo	ON	(451,210)						
1	Lansing	MI	(454,044)	Las Vegas	NV	Columbus	IN	Grand Rapids	MI
2	Spokane	WA	(446,706)	Santa Barbara	CA	Holland	MI	Lynchburg	VA
3	Winston	NC	(456,614)	Oxnard	CA	Logan	UT	Fond du Lac	WI
4	Flint	MI	(441,966)	Houston	TX	Appleton	WI	York	PA
5	Pensacola	FL	(439,987)	Napa	CA	Fort Wayne	IN	Appleton	WI
6	Durham	NC	(464,389)	Riverside	CA	Johnson City	TN	Gainesville	GA
7	Lexington	KY	(437,545)	Salinas	CA	Cleveland	TN	Gettysburg	PA
8	Santa Rosa	CA	(466,891)	Vallejo	CA	Muskegon	MI	Spartanburg	SC
9	Provo	UT	(474,351)	Las Cruces	NM	Waterloo	IA	Janesville	WI
10	Visalia	CA	(419,909)	Stockton	CA	Owensboro	KY	Dubuque	IA

B.   Population Similarity

Figure 1 below shows the 2006 population size of Waterloo and its top 10 closest MSAs by Overall Index. As pointed out in the previous Section, Winston is the most similar MSA to Waterloo in terms of population size which can be clearly seen in Figure 1. York is the next closest with a population size that is almost equivalent to that of Fort Wayne and Reading. We can further observe that the metropolitan area of Greensboro is the "farthest" from Waterloo among the MSAs with a population size of over 600 thousand.
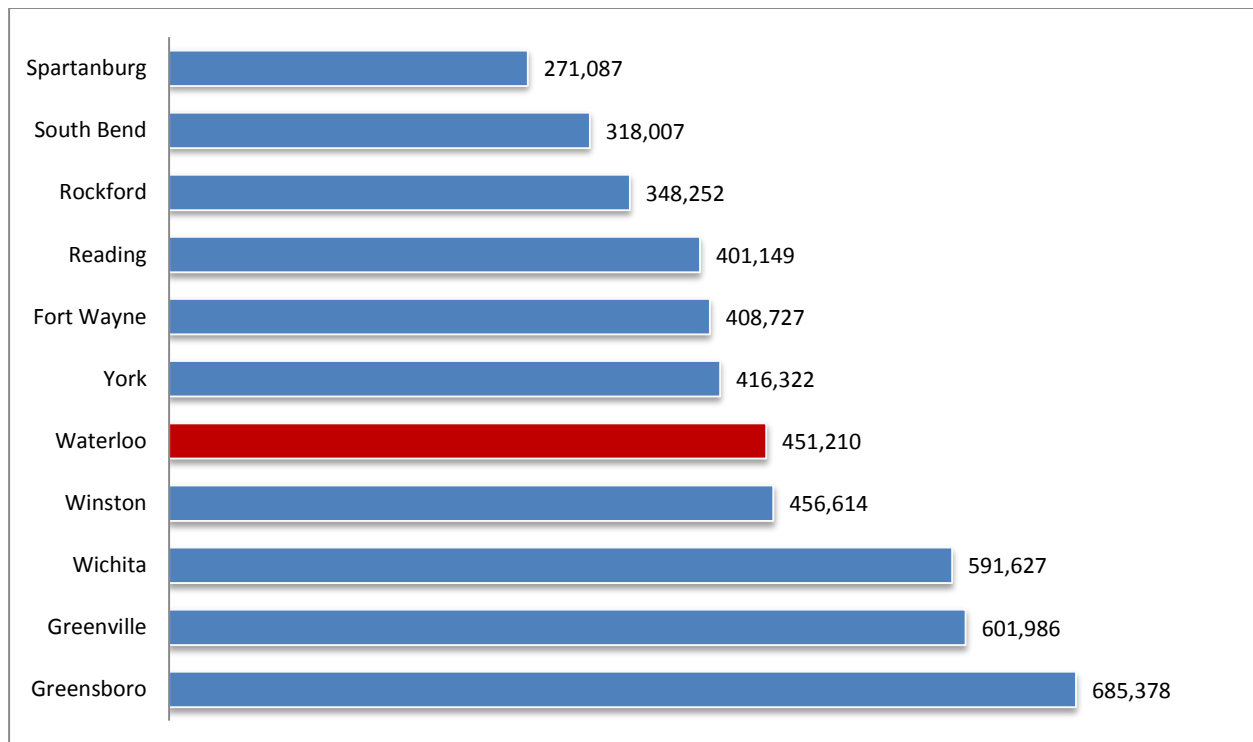

Figure 1: Population Size (2006) of Waterloo with its top 10 closest MSAs by Overall Index

In the next three sub-sections the actual data on the three indicators for Waterloo and its top 5 closest MSAs are plotted in radial diagrams. These diagrams will give us an overview of the degree of closeness of the top 5 closest MSAs to Waterloo in terms of Human Capital, Occupational Structure and Industrial Structure. As shown in Table 1, the top 5 closest city-regions based on the Overall Index include Reading, Winston, Rockford, Wichita and Greenville. Note that in the graphs for sections C, D and E, a red line is used in plotting the data for Waterloo and a blue line for the other 5 city-regions.

C.   Human Capital Similarity

The Human Capital index as described in the methodology section includes three population characteristics: educational attainment, immigration level and age distribution. All of these are in percent except for the number of PhDs per 1000 population.

The following information can be deduced from Figure 2:

- We can see that the majority of the top 5 closest MSAs have noticeably lower percentage of foreign-born individuals compared to Waterloo.

- Excluding the percentage of foreign-born individuals in the set of indicators, the top 5 MSAs in general appear to have a similar distribution to Waterloo.

- In terms of educational levels considered, Waterloo appears to have a slightly higher percentage of individuals with No High School educational attainment than a few of the MSAs.

- Considering the various age groups, these city-regions are similar to Toronto with a higher percentage of individuals in the 18-64 years old age group.
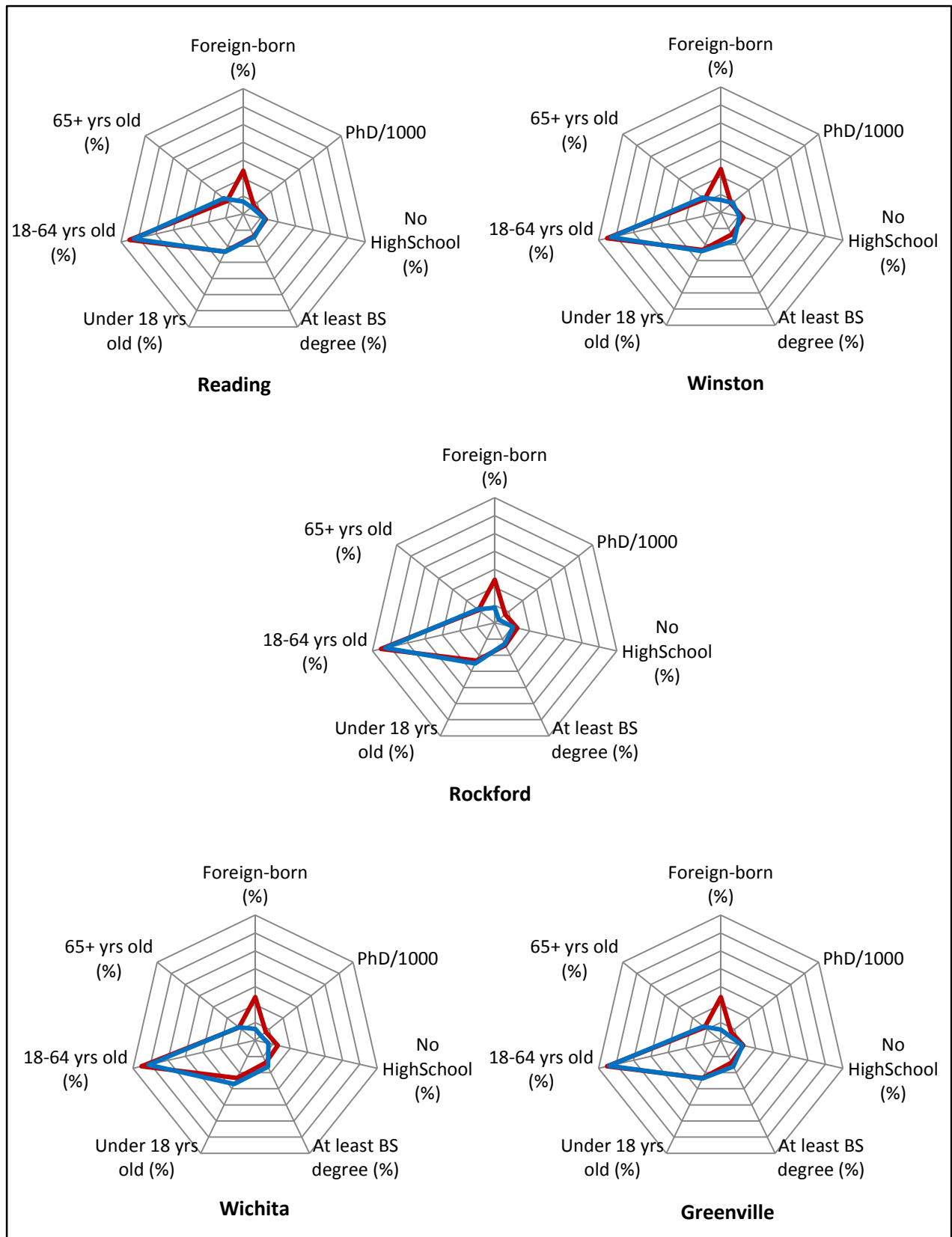
Figure 2: The actual data on the Human Capital indicator for Waterloo and its top 5 most similar MSAs

D. Occupational Similarity

The Occupational Structure covers 14 occupational categories which are comparable for both Canada and the United States. The list of occupational categories is included in Figure 3 below.

We can see from the radial diagrams in Figure 3 that:

- The distribution of the employment level in various occupational groups of the metropolitan area of Greenville and Wichita appear to be closer to Waterloo among the top 5 MSAs.

- Waterloo has a noticeably higher percentage of individuals employed in Productions Occupations (OC51) compared to the top 5 MSAs.

- Similar to Waterloo, the five MSAs tend to have a higher proportion of individuals in the Professional and Related Occupations (OC15); Management, Business, Financial Occupations (OC11); Office and Administrative Support Occupations (OC43); and Sales and Related Occupations (OC41). On the other hand, these MSAs have lower proportion of individuals in the Healthcare Support Occupations (OC31) and Farming, Fishing, and Forestry Occupations (OC45).
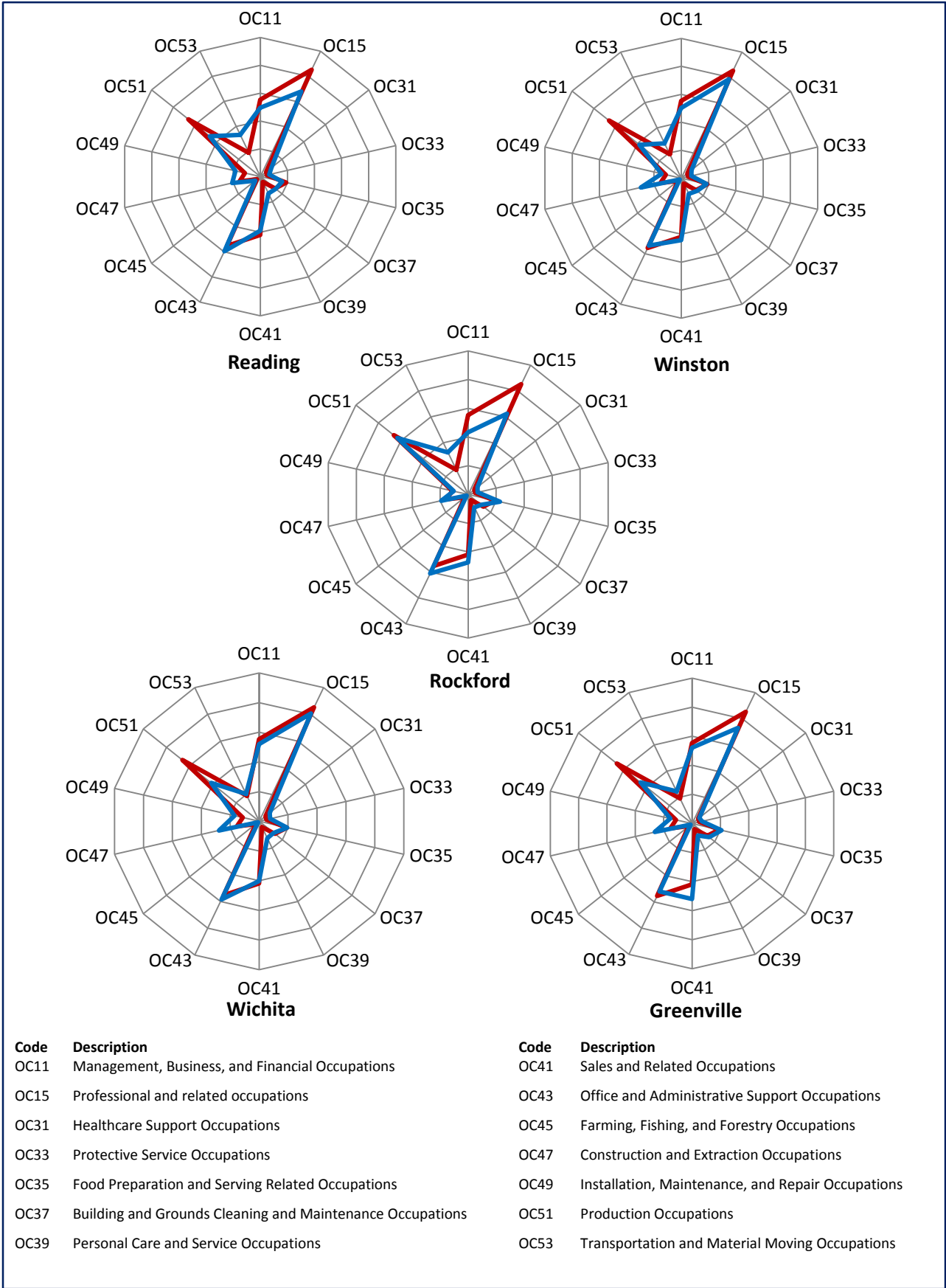
Figure 3: The actual data on Occupational Structure for Waterloo and its top 5 most similar MSAs

Code	Description
OC11	Management, Business, and Financial Occupations
OC15	Professional and related occupations
OC31	Healthcare Support Occupations
OC33	Protective Service Occupations
OC35	Food Preparation and Serving Related Occupations
OC37	Building and Grounds Cleaning and Maintenance Occupations
OC39	Personal Care and Service Occupations
OC41	Sales and Related Occupations
OC43	Office and Administrative Support Occupations
OC45	Farming, Fishing, and Forestry Occupations
OC47	Construction and Extraction Occupations
OC49	Installation, Maintenance, and Repair Occupations
OC51	Production Occupations
OC53	Transportation and Material Moving Occupations

E.   Industrial Similarity

The Industrial Structure indicator covers the 2-digit level NAICS codes that are comparable in both countries. The list of industrial categories included in the analysis is shown in Figure 4.

From Figure 4 we can observe the following:

- Among the 5 MSAs, Reading appears to have the most similar distribution of employment levels in various industries to Waterloo.

- Similar to Waterloo, the majority of the MSAs have a significantly higher employment level in n Manufacturing (31) than any of the industries. The other industries in which the MSAs have a noticeably higher employment level include Retail Trade (44) and Health Care and Social Assistance (62).

- Waterloo has a slightly higher employment level in Educational Services (61) than all of the top 5 MSAs.
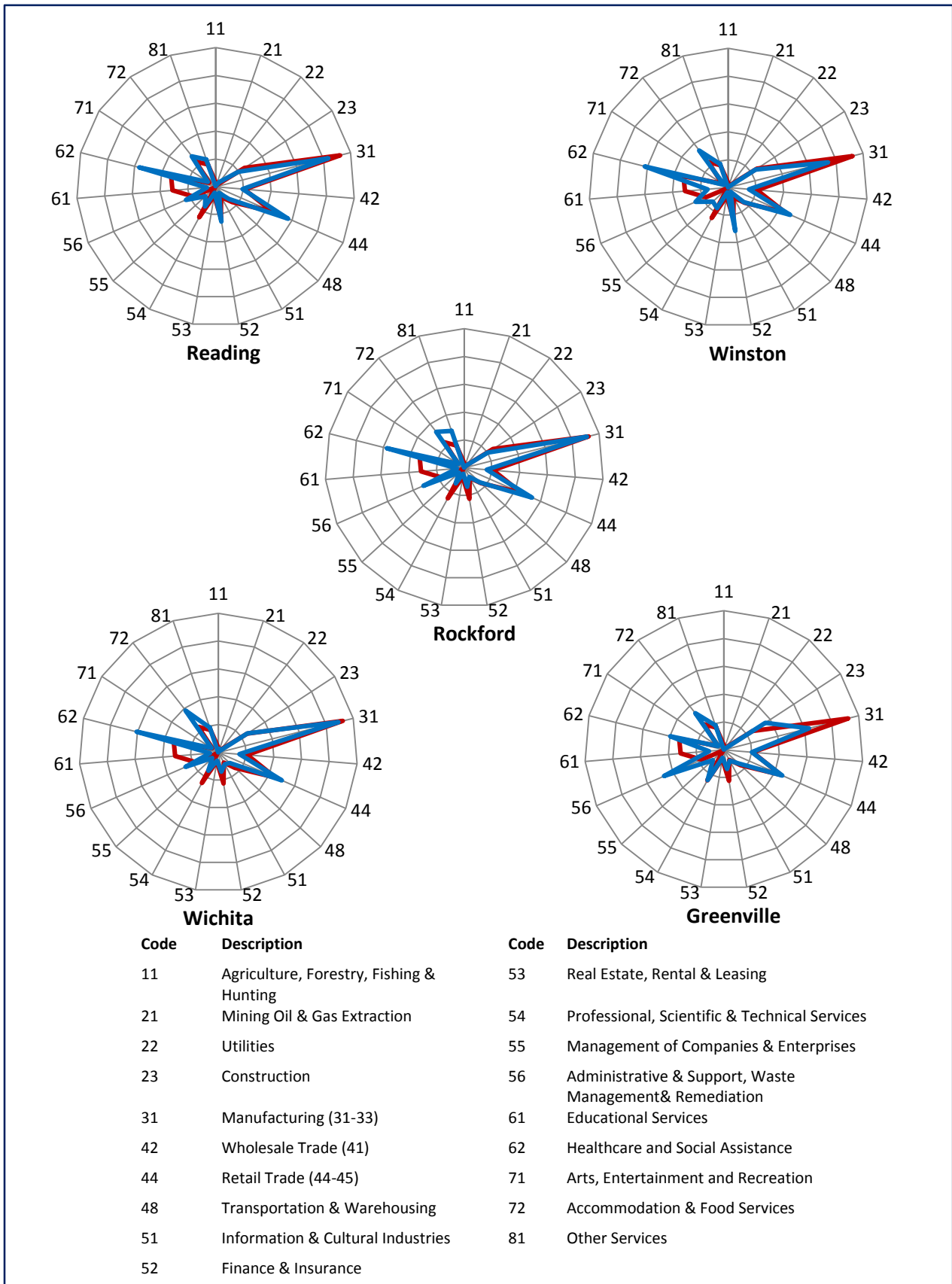
Code	Description	Code	Description
11	Agriculture, Forestry, Fishing & Hunting	53	Real Estate, Rental & Leasing
21	Mining Oil & Gas Extraction	54	Professional, Scientific & Technical Services
22	Utilities	55	Management of Companies & Enterprises
23	Construction	56	Administrative & Support, Waste Management& Remediation
31	Manufacturing (31-33)	61	Educational Services
42	Wholesale Trade (41)	62	Healthcare and Social Assistance
44	Retail Trade (44-45)	71	Arts, Entertainment and Recreation
48	Transportation & Warehousing	72	Accommodation & Food Services
51	Information & Cultural Industries	81	Other Services
52	Finance & Insurance		

Figure 4: The actual data on the industrial structure for Waterloo and its top 5 most similar MSAs

F. Benchmarking Analysis

The data on economic measures such as employment growth rate (compound annual growth rate), employment income (median employment earnings) and unemployment rate of the top 10 closest MSAs to Waterloo were gathered and is summarized in Table 3 below. Included in the table are the rankings of the city-regions data which are located on the right side of each value. Based on the information presented in Table 3, we can see that:

- Waterloo performs better than all its closest neighbours in terms of employment growth rate (highest) and unemployment rate (lowest).   The CMA's median employment income is also among highest (top 3).

- Among the closest neighbours of Waterloo, the metropolitan area of South Bend seems to be not performing so well for having the lowest employment income, the highest unemployment rate and a negative employment growth rate.

- Greenville is another MSA that appears to be lagging behind with its employment income ranking the second lowest and its employment growth rate ranking the lowest. Its unemployment rate is also quite high, ranking 7th among the city-regions.

Table 3: Benchmarking survey for the city of Waterloo

City-Regions (CMAs/MSAs)		Employment Growth Rate (2003-2009)		Employment Income in USD (2010)		Unemployment Rate (2010)	
Waterloo	**ON**	**1.38%**	**(1)**	**$30,158**	**(3)**	**8.0%**	**(1)**
Reading	PA	0.15%	(2)	$28,868	(4)	10.2%	(5)
Winston	NC	-0.49%	(5)	$27,249	(6)	10.1%	(4)
Rockford	IL	-0.87%	(9)	$26,448	(7)	13.9%	(10)
Wichita	KS	0.03%	(3)	$27,792	(5)	10.0%	(3)
Greenville	SC	-1.07%	(11)	$25,659	(10)	11.4%	(7)
Spartanburg	SC	-0.52%	(6)	$25,721	(9)	12.0%	(8)
Greensboro	NC	-1.03%	(10)	$25,878	(8)	12.6%	(9)
South Bend	IN	-0.58%	(7)	$24,426	(11)	14.2%	(11)
Fort Wayne	IN	-0.62%	(8)	$30,606	(2)	10.4%	(6)
York	PA	-0.04%	(4)	$31,270	(1)	9.7%	(2)