where have all the cowboys gone?
assessing talent flows between Canadian cities

Greg Spencer
Program on Globalization & Regional Innovation Systems
Munk Centre for International Studies
University of Toronto

Tara Vinodrai
Department of Geography and Environmental Management
& Centre for Environment and Business
University of Waterloo

background

- quantitative analysis using city-region/cluster database to address key research questions related to themes I and II
  - innovation and economic performance of city-regions
    - employment growth, income, patenting
    - diversity
    - inequality, social exclusion

  - talent attraction / retention in city-regions
    - circulation of talent, mobility flows
    - growth of highly educated / creative workforce
    - quality of place, place characteristics

outline

- the attraction and retention of highly educated / creative workers ('talent')

- data and methods
  - city-region level data, occupational approach
  - patterns of mobility, mobility flows
  - quantitative analysis

- *preliminary* analysis of talent flows between Canadian city-regions
  - describe and explain mobility patterns by occupation

- identify next steps and future directions

attracting and retaining talent

- labour market mobility of highly skilled workers ('talent') and innovation
  - movement between firms, regions results in transfer of practices and ideas
    - "[workers] act as individual technology-transfer agents, moving ideas and techniques from firm to firm." (Christopherson 2002: 17)
  - 'brain circulation' facilitates building of networks / 'pipelines' between places (Bathelt et al. 2004; Saxenian 2006)

- regional economic development through attracting and retaining highly educated / creative workers
  - attracted to places with high levels of diversity, openness and tolerance, and other quality of place characteristics (Florida 2002)
  - differences *between* occupations in terms of quality of place characteristics that are important, politics, etc. (Markusen 2006)

attracting and retaining talent

- literature suggests a complex picture of migration and mobility flows
  - distinctive and highly uneven geography
    - differences between domestic and international flows of talent
  - shaped by specific occupationally-based labour markets and industry dynamics, as well as individual characteristics / circumstances (e.g. age, gender, qualifications, etc.)

- limited evidence that documents local and global talent flows *between* places leaves some unanswered questions...

key questions

- what are the overall patterns of international and domestic mobility in Canada?

- are highly educated / creative workers more mobile than other workers?

- what are the patterns of mobility of highly educated / creative workers?

- what are the key place characteristics / determinants that explain the mobility of highly educated / creative workers?

attracting talent: data sources and methods

- data sources
  - Census of Population, 2001
  - Demographic Estimates and Components of Population Growth, 1996-2001
  - US Patent and Trademark Office, 2000-2003

- analysis of patterns of migration / mobility
  - descriptive statistics, network analysis

- analysis of relationships between mobility patterns and place characteristics (by occupation)
  - regression analysis

attracting talent: level of analysis

- geography (140 city-regions)
  - 27 Census Metropolitan Areas (CMAs, urban core ≥ 100,000)
  - 113 Census Agglomerations (CAs, urban core ≥ 10,000)

- occupations (50 occupations)
  - 2001 National Occupational Classification – Statistics (NOC-S)
  - measured at the 2-digit level

- mobility flows
  - net domestic and international migration (population)
  - net domestic migration by occupation (labour force)
    - derived from the Census 2B form (20% sample): Where did this person live **5 years ago**, that is, on May 15, 1996?

key questions

- what are the overall patterns of international and domestic mobility in Canada?

- are highly educated / creative workers more mobile than other workers?

- what are the patterns of mobility of highly educated / creative workers?

- what are the key place characteristics / determinants that explain the mobility of highly educated / creative workers?

## talent flows: domestic and international migration

Net Migration 1996-2001
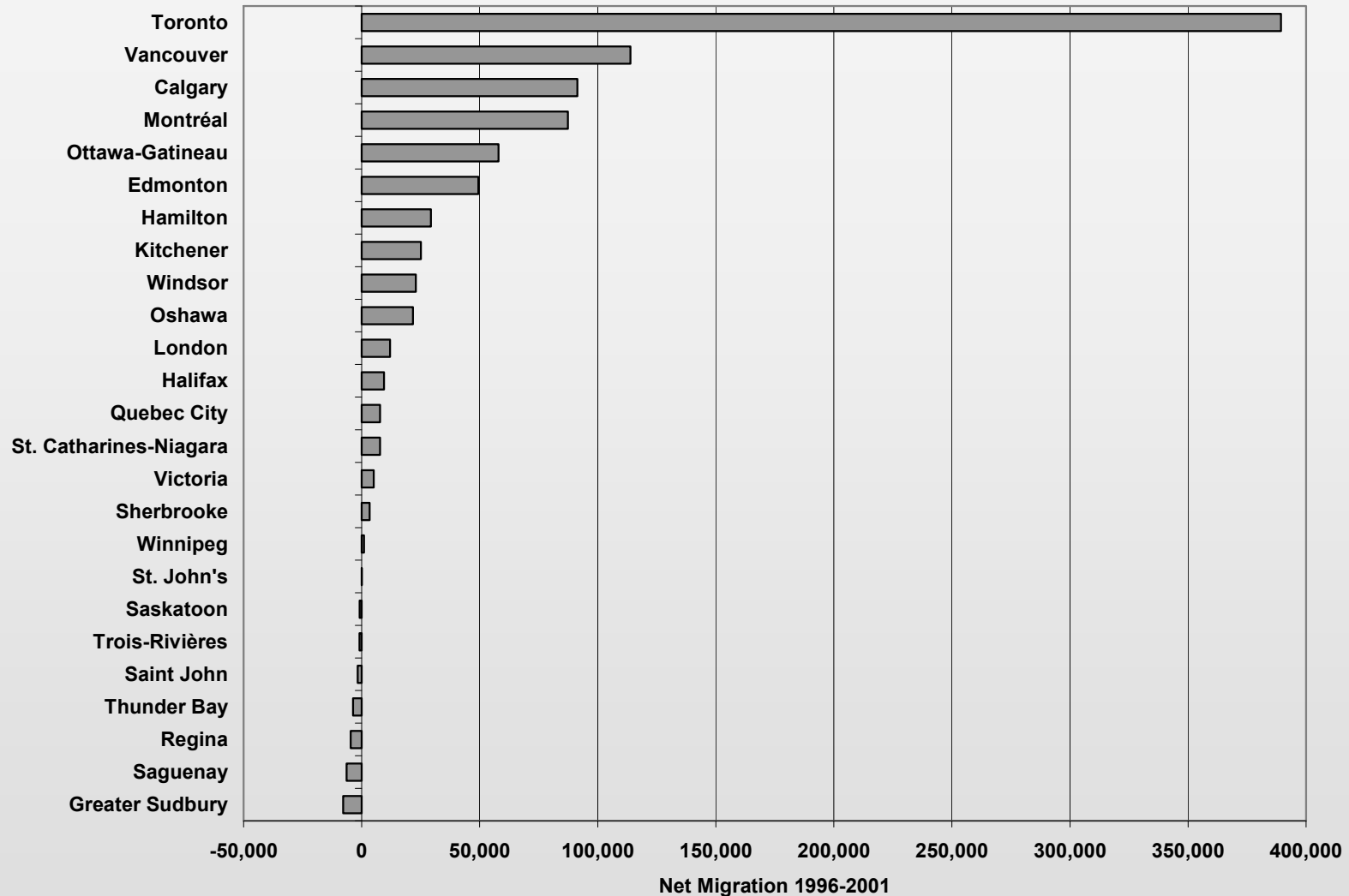
talent flows: net domestic & international migration
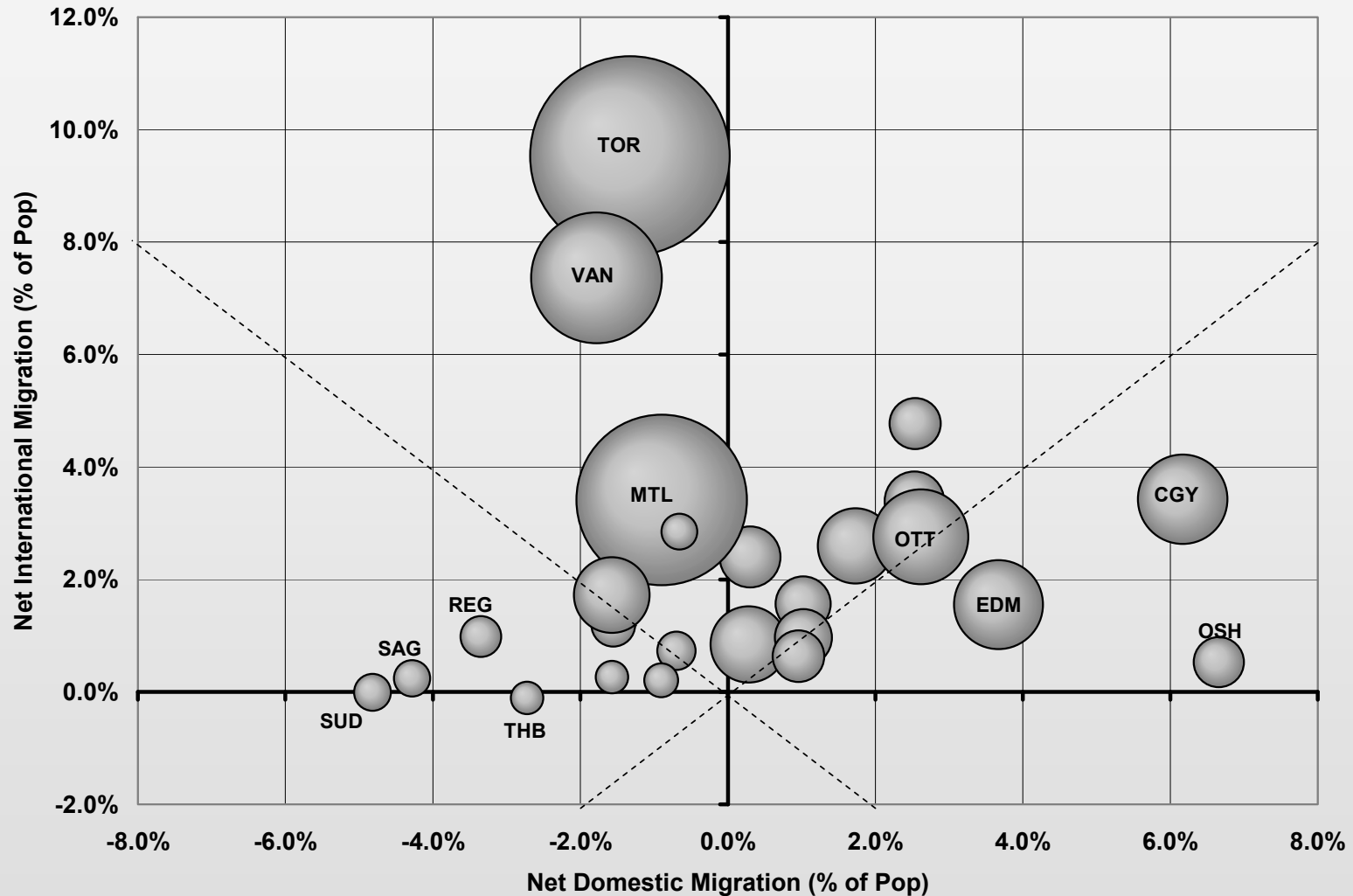
talent flows: gateway cities

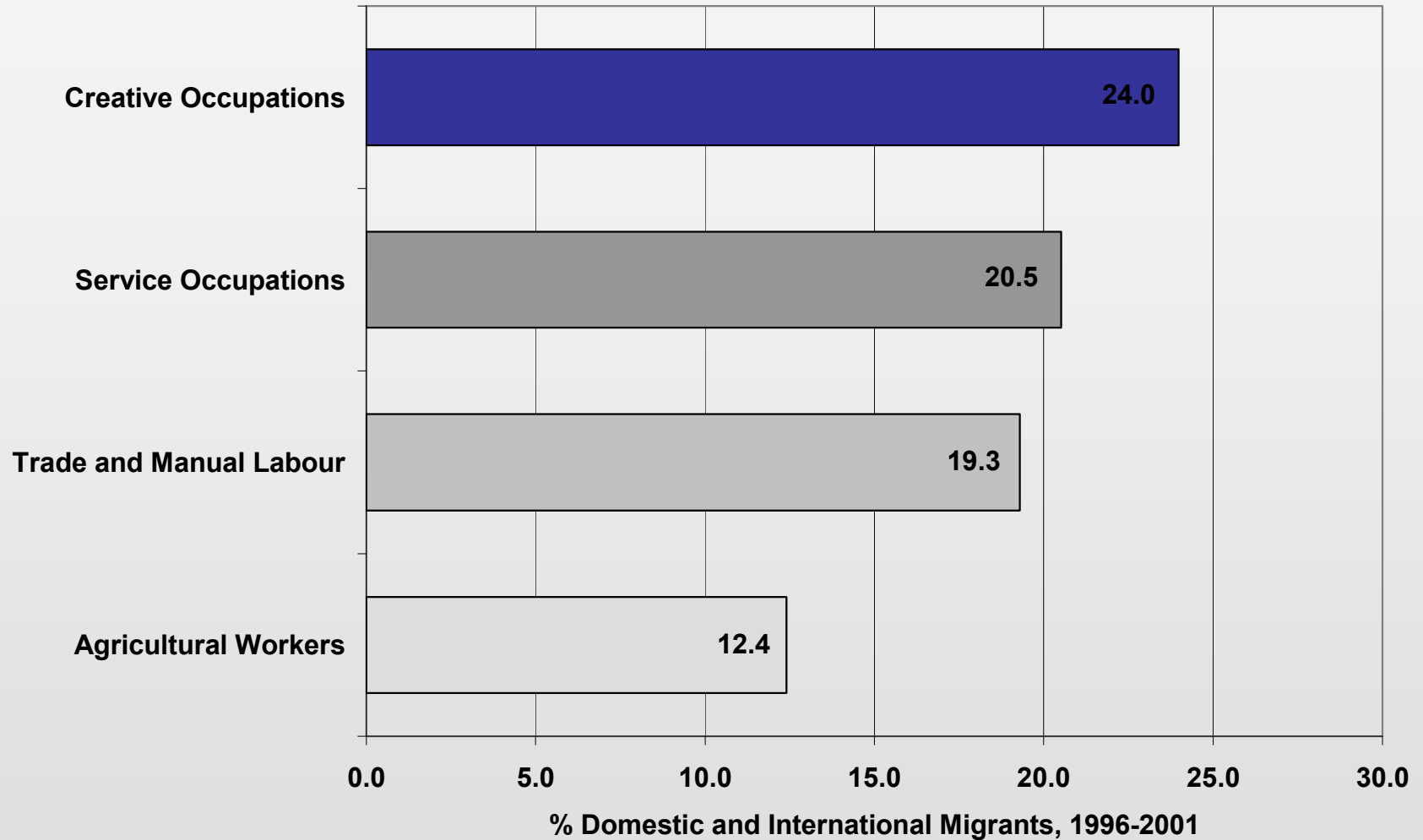|	Share of National Total			
	Population 2001	**Immigration 1996-2001**	**Emigration 1996-2001**	**Returning Emigrants 1996-2001**
Toronto	15.5%	44.4%	20.4%	21.5%
Montréal	11.3%	12.6%	11.9%	11.3%
Vancouver	6.6%	15.8%	12.6%	9.9%
Ottawa-Gatineau	3.5%	3.6%	6.4%	6.0%
Calgary	3.1%	3.6%	5.8%	8.3%
Quebec City	2.3%	0.7%	1.1%	1.3%
Hamilton	2.2%	1.9%	2.1%	2.0%
London	1.5%	1.2%	1.7%	1.6%
Kitchener - Waterloo	1.4%	1.5%	1.5%	1.3%
Halifax	1.2%	0.7%	1.2%	1.1%
Saskatoon	0.8%	0.4%	0.8%	0.6%
St. John's	0.6%	0.1%	0.3%	0.3%
Trois-Rivières	0.5%	0.1%	0.1%	0.1%
Saint John	0.4%	0.1%	0.3%	0.2%
Kingston	N/A	N/A	N/A	N/A
National Totals	*30,689,035*	*1,082,230*	*234,607*	*89,831*

talent flows: domestic mobility - all occupations
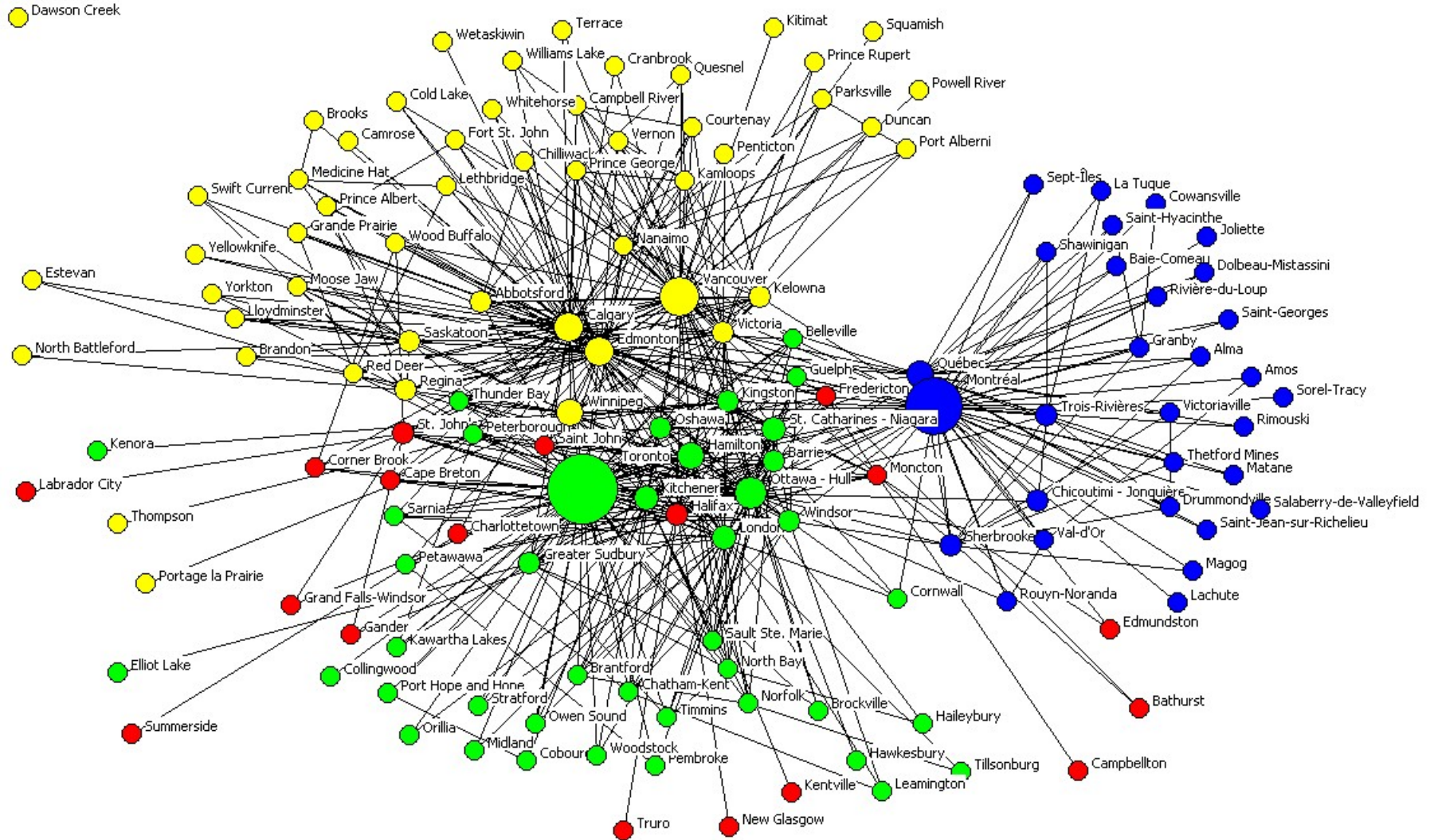
key questions

- what are the overall patterns of international and domestic mobility in Canada?

- are highly educated / creative workers more mobile than other workers?
  - what differences exist between occupational groups?

- what are the patterns of mobility of highly educated / creative workers?

- what are the key place characteristics / determinants that explain the mobility of highly educated / creative workers?

talent flows: 'creative' workers are more mobile

Chart: % Domestic and International Migrants, 1996-2001

- Creative Occupations: **24.0**
- Service Occupations: **20.5**
- Trade and Manual Labour: **19.3**
- Agricultural Workers: **12.4**

X-axis: 0.0, 5.0, 10.0, 15.0, 20.0, 25.0, 30.0

% Domestic and International Migrants, 1996-2001

Source: Spencer and Vinodrai (2006)

talent flows: % mobile (5-year) by occupation - top 10

Occupations (3-digit NOCS)	Domestic	Int'l	Total
Managers in protective service	44.1	2.5	**46.6**
Other occupations in protective service	35.5	1.1	**36.6**
Other engineers	24.5	10.3	**34.8**
Transportation officers and controllers	31.8	2.6	**34.4**
Computer and information systems professionals	22.9	11.2	**34.1**
University professors and assistants	20.9	13.1	**34.0**
Mine service workers / oil & gas drilling operators	32.7	0.7	**33.4**
Life science professionals	28.5	4.7	**33.2**
Physical science professionals	23.4	9.7	**33.1**
Civil, mechanical, electrical & chemical engineers	23.3	8.8	**32.2**

Source: Spencer and Vinodrai (2006)

ISRN Annual Meeting, Montreal, Quebec - May 2, 2008

talent flows: % mobile (5-year) by occupation - bottom 10

| Occupations (3-digit NOCS)	Domestic	Int'l	Total
Agriculture and horticulture workers	12.4	3.7	**16.1**
Machine ops. & related in pulp & paper / wood processing	14.3	1.2	**15.5**
Upholsterers, tailors, shoe repairers, jewellers and related	11.8	3.5	**15.3**
Public works and other labourers, n.e.c.	14.4	0.9	**15.3**
Heavy equipment operators	14.8	0.4	**15.2**
Logging and forestry workers	14.7	0.3	**15.0**
Mail and message distribution occupations	13.1	1.8	**14.9**
Logging machinery operators	12.6	0.2	**12.8**
Contractors, supervisors in agric., hortic. & aquaculture	7.9	1.2	**9.1**
Other fishing and trapping occupations	8.0	0.3	**8.3**
Fishing vessel masters and skippers and fishermen	7.0	0.2	**7.2**

Source: Spencer and Vinodrai (2006)

key questions

- what are the overall patterns of international and domestic mobility in Canada?

- are highly educated / creative workers more mobile than other workers?

- what are the patterns of mobility amongst highly educated / creative workers?
    - what differences exist between occupational groups?

- what are the key place characteristics / determinants that explain the mobility of highly educated / creative workers?
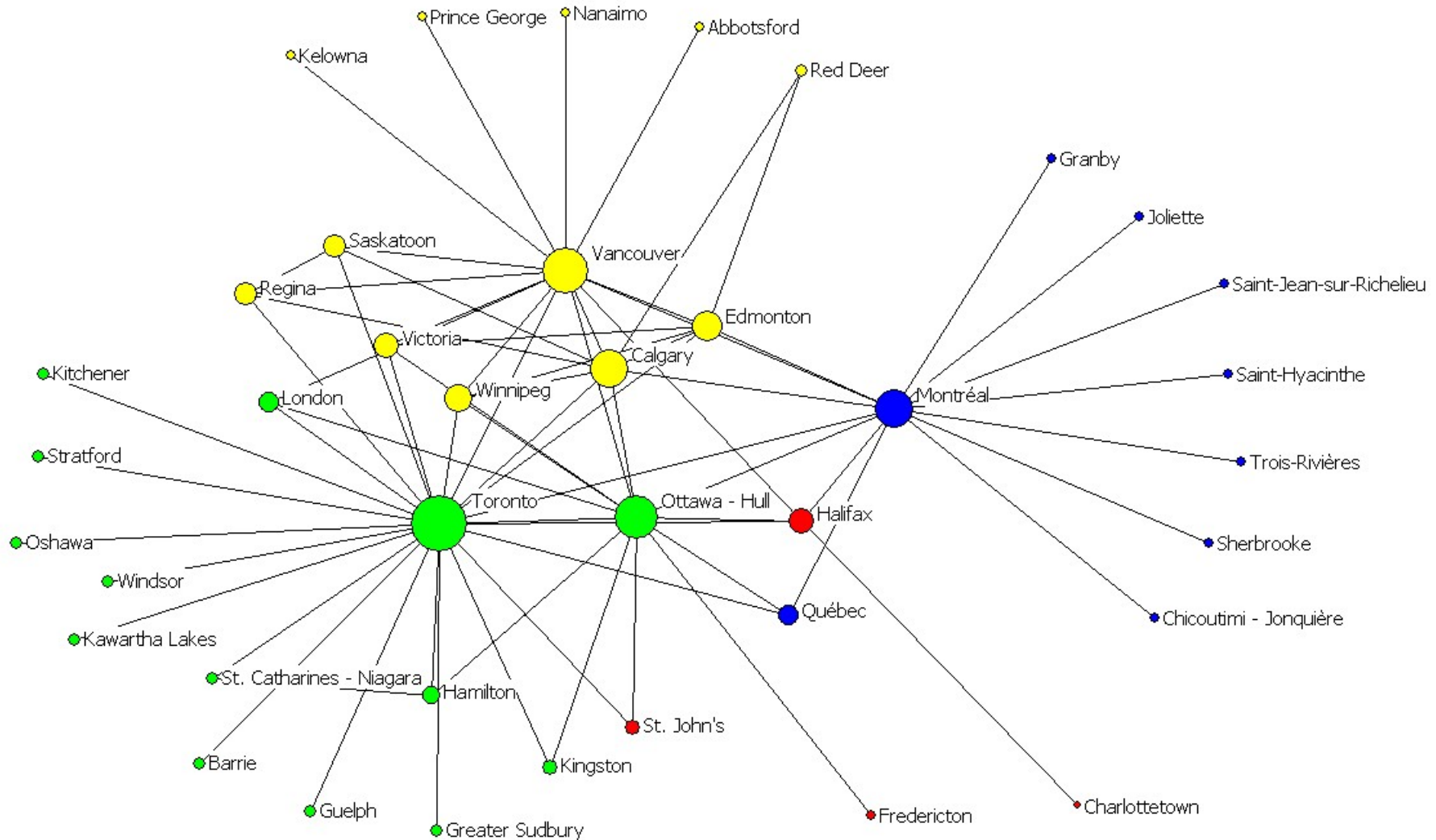
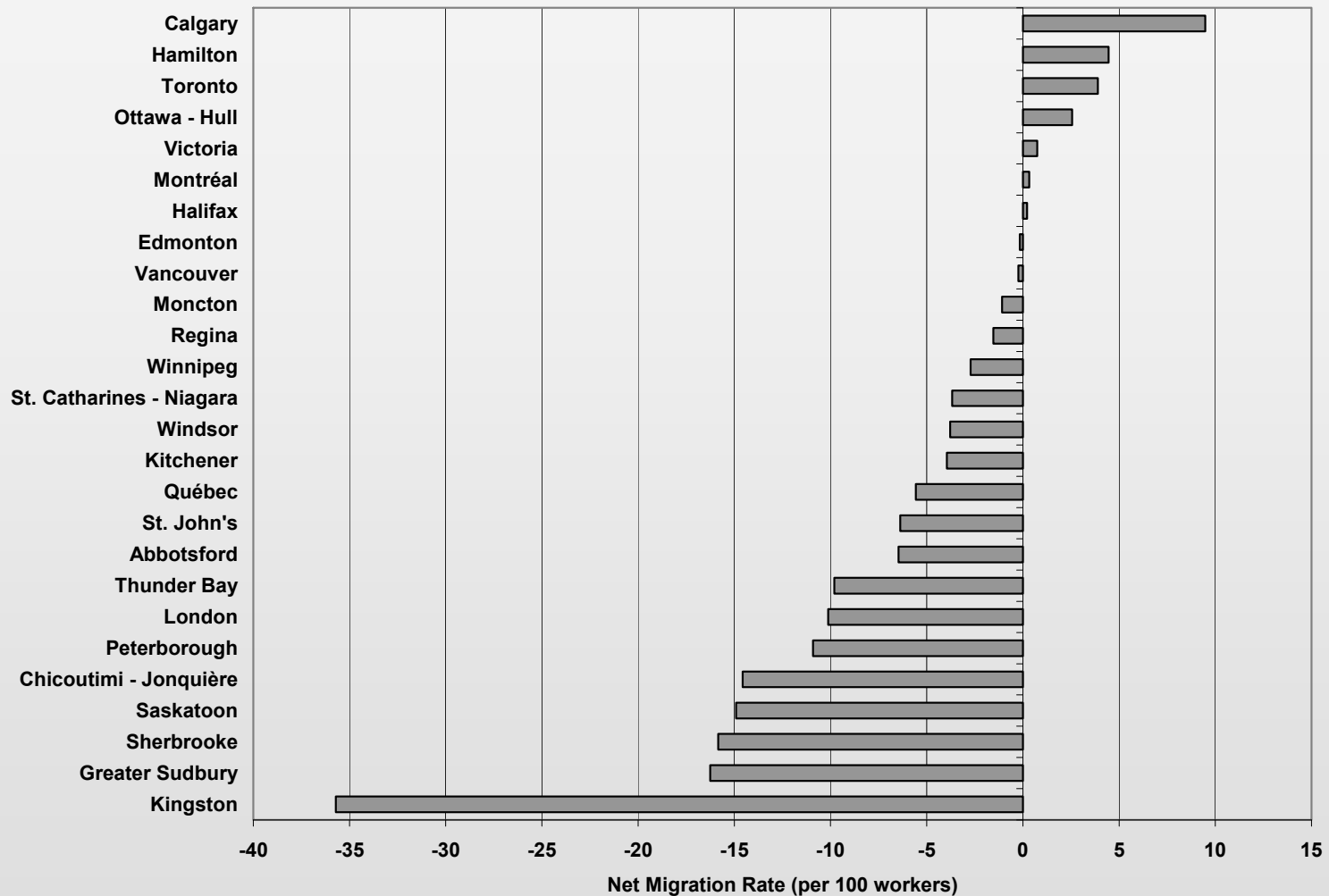## talent flows: business and finance professionals
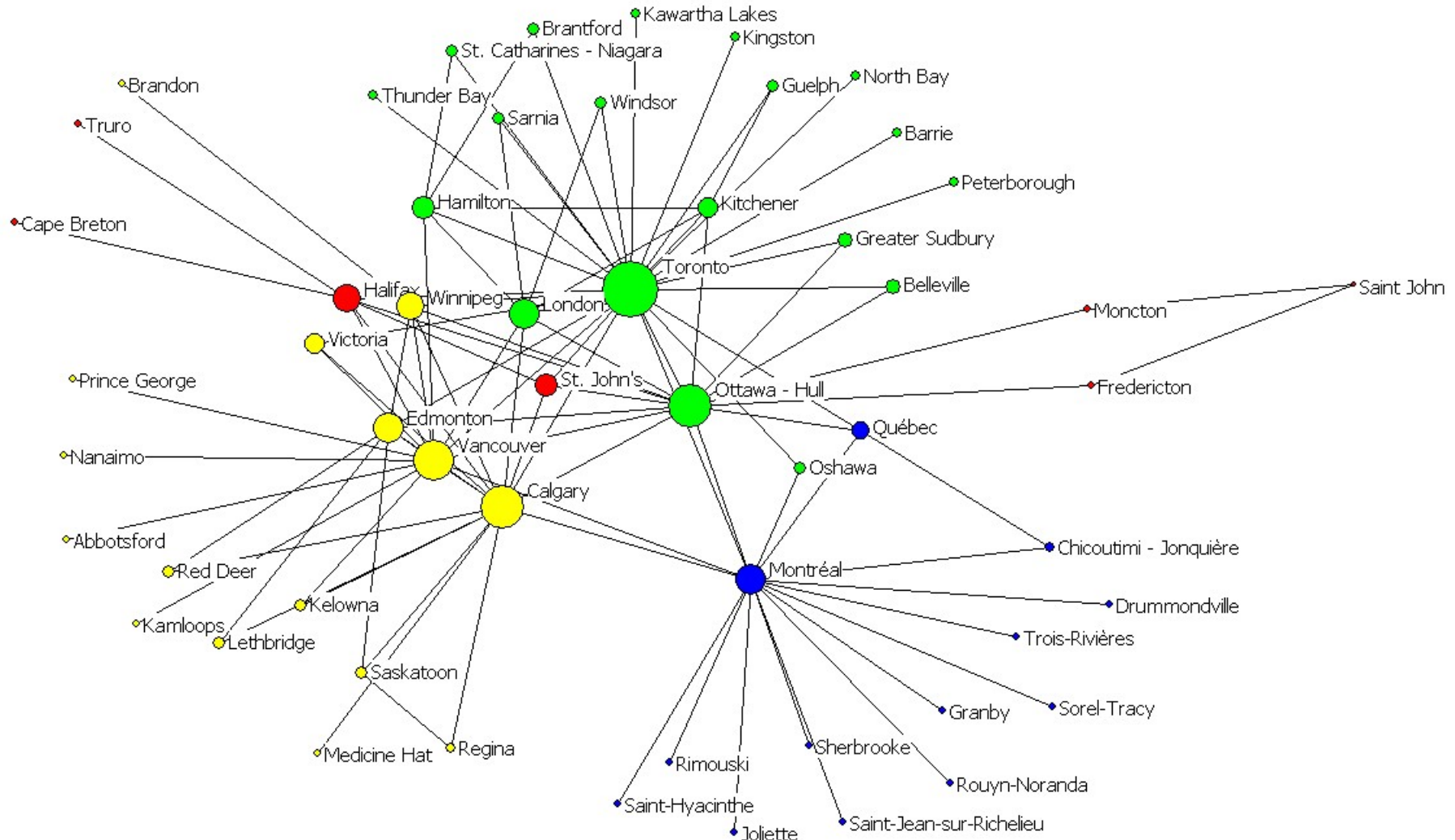
talent flows: **natural and applied science professionals**
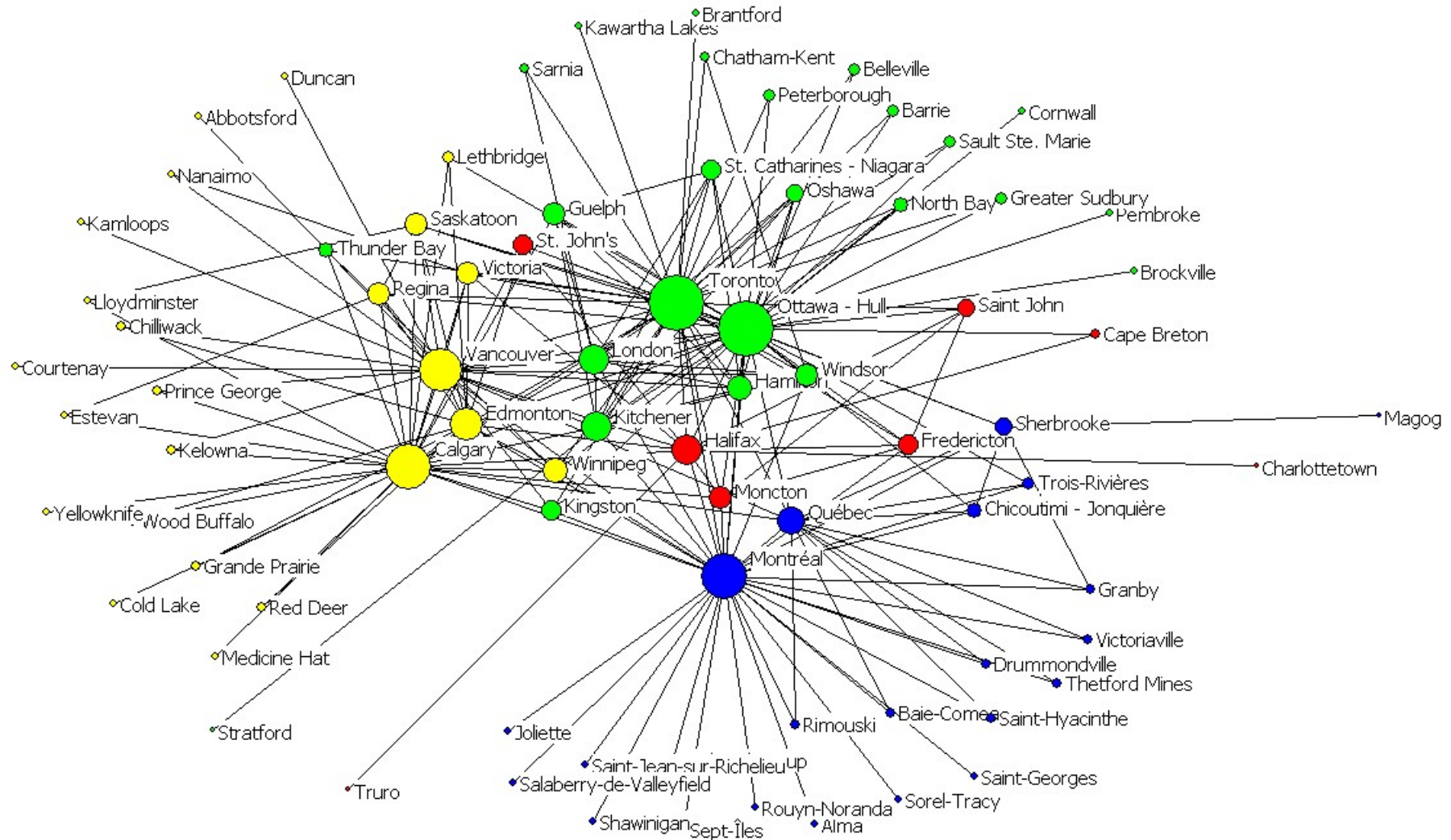
talent flows: arts and culture professionals

net domestic flows: business and finance professionals

Horizontal bar chart titled "Net Migration Rate (per 100 workers)" showing net domestic flows by city:

City	Net Migration Rate (per 100 workers)
Calgary	~9.5
Hamilton	~4.5
Toronto	~4
Ottawa - Hull	~2.5
Victoria	~0.5
Montréal	~0.5
Halifax	~0
Edmonton	~0
Vancouver	~-0.5
Moncton	~-1
Regina	~-1.5
Winnipeg	~-2.5
St. Catharines - Niagara	~-3.5
Windsor	~-3.5
Kitchener	~-3.5
Québec	~-5.5
St. John's	~-6.5
Abbotsford	~-6.5
Thunder Bay	~-9.5
London	~-10
Peterborough	~-11
Chicoutimi - Jonquière	~-14.5
Saskatoon	~-15
Sherbrooke	~-16
Greater Sudbury	~-16.5
Kingston	~-35.5

net domestic flows: natural and applied science professionals
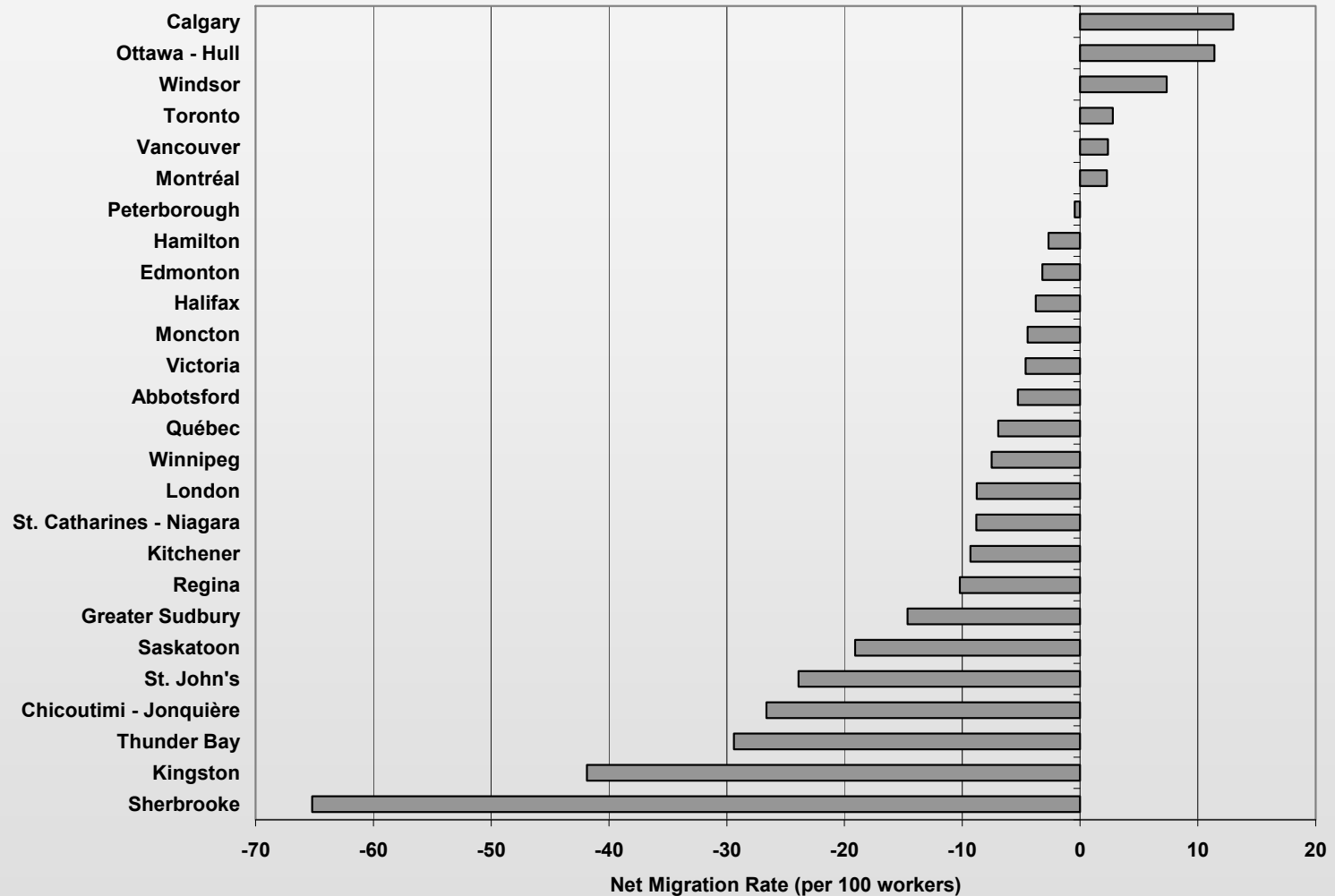
net domestic flows: arts and culture professionals

Net Migration Rate (per 100 workers)

City	Net Migration Rate
Moncton	~6
Ottawa - Hull	~5
Calgary	~5
Toronto	~3.5
Halifax	~2.5
Montréal	~2.5
Victoria	~2
Vancouver	~0.5
Abbotsford	~0
Winnipeg	~-1
Hamilton	~-1
St. Catharines - Niagara	~-1.5
Kitchener	~-2
St. John's	~-2.5
Regina	~-3
Edmonton	~-4
Peterborough	~-4
Windsor	~-5
Thunder Bay	~-7.5
Kingston	~-8.5
Saskatoon	~-10
London	~-13
Québec	~-15
Sherbrooke	~-23
Greater Sudbury	~-24
Chicoutimi - Jonquière	~-42

net domestic flows: chefs and cooks
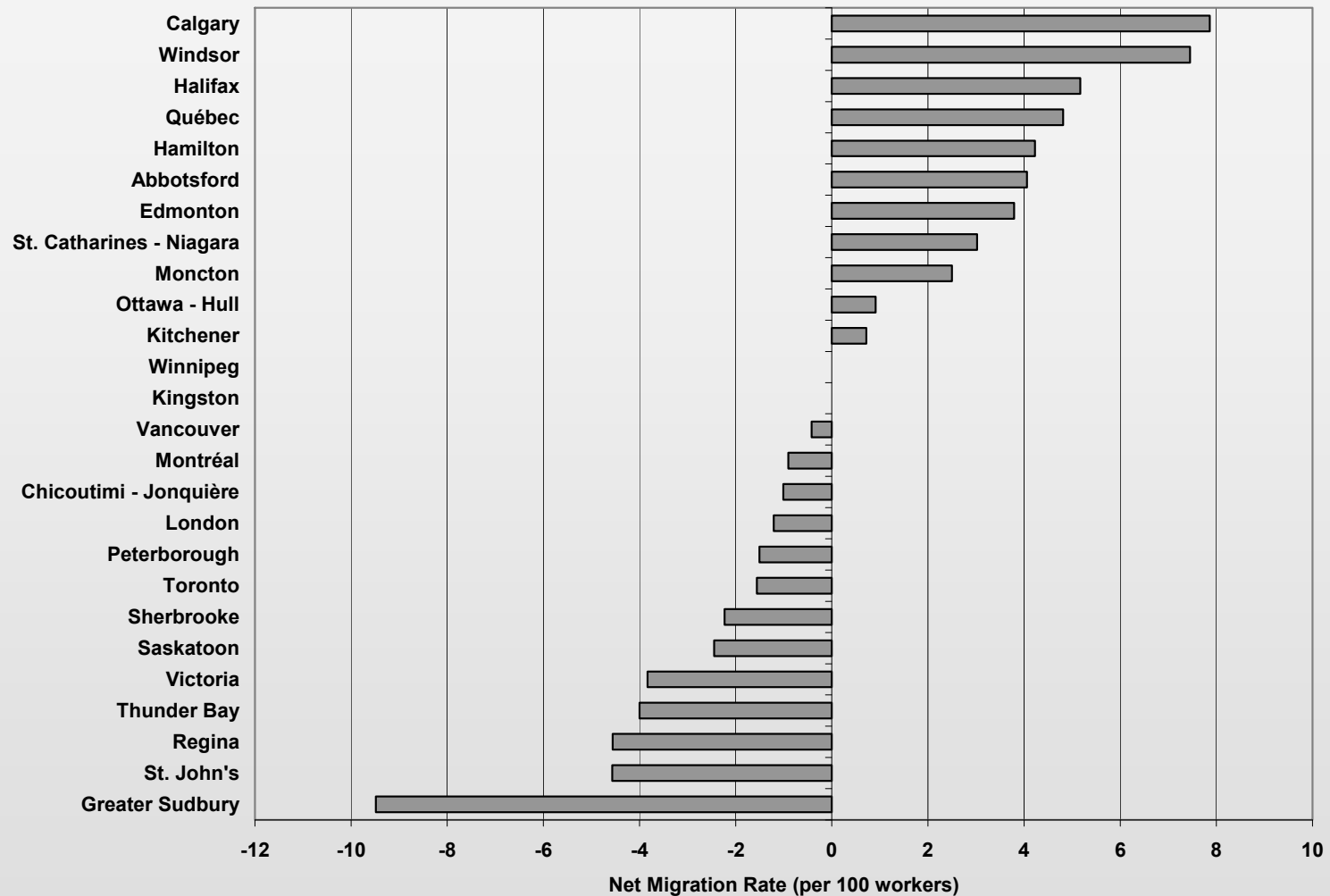
key questions

- what are the overall patterns of international and domestic mobility in Canada?

- are highly educated / creative workers more mobile than other workers?

- what are the patterns of mobility of highly educated / creative workers?

- what are the key place characteristics that explain the mobility of highly educated / creative workers?
  - what differences exist between occupational groups?

attracting talent: competing or complementary explanations?

- what place characteristics / dimensions of quality of place are important in attracting / retaining talent?
  - economic & social characteristics of the region
  - investment in local / regional innovation system
  - investment in local arts and culture scene
  - career opportunity / local career 'buzz'
    - critical mass of people in same occupation
    - diversity of work opportunities

- regression analysis
  - backwards, step-wise regression
  - dependent variable: net domestic migration (by occupation)
  - N=140 city-regions

attracting talent: explanatory variables

- economic characteristics
    - unemployment rate
    - regional average annual income
    - affordability / cost of living
        - % households spending more than 30% of income on housing
    - economic diversity - industry, occupation
    - % university degree or higher

- social diversity, openness / tolerance
    - % foreign-born
    - cultural diversity - place of birth
    - % persons in same-sex couples

attracting talent: explanatory variables

- quality of / investment in innovation system
    - patents, presence of university, PhDs per 1000
    - % post-secondary or higher

- quality of / investment in local arts/cultural scene
    - artists per 1000 population

- career 'buzz' / opportunity
    - number of people in same occupation (critical mass)
    - international in-migrants in same occupation (global talent flow)

- *note:* since we are dealing with aggregate flows (i.e., not individuals), unable to account for gender, age, and family structure

net domestic flows: quality of place characteristics

	Overall	Creative
Unemployment Rate	√	√
Income		
Affordability	√	
University	√	√
Patents per 1000		
PhDs per 1000		√
% Post Secondary +	√	√
% Bachelors +		
% Foreign Born		
% Bohemians		√
% Same Sex Couples		
Critical Mass		
Industrial Diversity	√	√
Occupational Diversity		
Cultural Diversity		

net domestic flows: quality of place characteristics

	Business & Finance Professionals	Natural & Applied Science Professionals	Arts & Culture Professionals	Chefs and Cooks	Construction Trades	Manufacturing Assemblers
Unemployment Rate	✔	✔		✔	✔	✔
Income				✔		
Affordability			✔		✔	
University						✔
Patents per 1000					✔	✔
PhDs per 1000	✔	✔				✔
% Post Secondary +				✔	✔	
% Bachelors +	✔	✔			✔	
% Foreign Born		✔				
% Bohemians			✔			
% Same Sex Couples			✔			
Critical Mass						
Industrial Diversity					✔	
Occupational Diversity		✔			✔	
Cultural Diversity						

tentative conclusions

- talent attraction (mobility) must be understood within the broader national context of immigration and emigration patterns

- high levels of variation in *levels* of mobility amongst occupational groups
  - workers in 'creative' occupations are more mobile

- mobility patterns are highly *regionalized*
  - some variation by occupation

- different dimensions of quality of place matter to the mobility patterns of different occupations
  - some confirmation of the "Florida" hypotheses
  - important caveat: variation amongst occupations

potential policy implications and next steps

- different dimensions of quality of place matter to the mobility patterns of different occupations
  - no 'magic bullet' / one-size-fits-all approach to policy making
  - policy needs to address a wide range of 'quality of place' characteristics if pursuing 'talent'-based strategy

- refine analysis?
  - different measures / specification of the dependent and independent variables
  - explore the differences between global talent flows (international in-migration) and local talent flows (domestic in-migration)
  - are there differences by knowledge types?

- incorporation of additional data
  - include data from the 2006 *Census of Population*

thank you

- thanks to Meric Gertler, David Wolfe and the participants of the 2007 ONRIS Fall Workshop for their valuable suggestions and input, as well as assistance from Scott Pennington, and support from Deborah Huntley.

- questions: tvinodra@fesmail.uwaterloo.ca or greg.spencer@utoronto.ca