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

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### 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
overview  talent  method  mobility  flows  next steps

**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

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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)

• 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

- 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 $\geq 100,000$)
  - 113 Census Agglomerations (CAs, urban core $\geq 10,000$)

- 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

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talent flows: net domestic & international migration

Net Domestic Migration (% of Pop) vs. Net International Migration (% of Pop)

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Toronto</td>
<td>15.5%</td>
<td>44.4%</td>
<td>20.4%</td>
<td>21.5%</td>
</tr>
<tr>
<td>Montréal</td>
<td>11.3%</td>
<td>12.6%</td>
<td>11.9%</td>
<td>11.3%</td>
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<tr>
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<td>15.8%</td>
<td>12.6%</td>
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<tr>
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<td>3.6%</td>
<td>6.4%</td>
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<td>3.6%</td>
<td>5.8%</td>
<td>8.3%</td>
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<td>Quebec City</td>
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<td>0.7%</td>
<td>1.1%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Hamilton</td>
<td>2.2%</td>
<td>1.9%</td>
<td>2.1%</td>
<td>2.0%</td>
</tr>
<tr>
<td>London</td>
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<td>1.2%</td>
<td>1.7%</td>
<td>1.6%</td>
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<tr>
<td>Kitchener - Waterloo</td>
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<td>1.5%</td>
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</tr>
<tr>
<td>Halifax</td>
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<td>0.7%</td>
<td>1.2%</td>
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<tr>
<td>Saskatoon</td>
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<td>0.4%</td>
<td>0.8%</td>
<td>0.6%</td>
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<td>St. John's</td>
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<tr>
<td>Trois-Rivières</td>
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<td>0.1%</td>
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<td>0.1%</td>
</tr>
<tr>
<td>Saint John</td>
<td>0.4%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.2%</td>
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<tr>
<td>Kingston</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>National Totals</td>
<td>30,689,035</td>
<td>1,082,230</td>
<td>234,607</td>
<td>89,831</td>
</tr>
</tbody>
</table>
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

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

% Domestic and International Migrants, 1996-2001

Source: Spencer and Vinodrai (2006)
talent flows: % mobile (5-year) by occupation - top 10

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

Source: Spencer and Vinodrai (2006)
talent flows: % mobile (5-year) by occupation - bottom 10

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

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

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talent flows: natural and applied science professionals
talent flows: arts and culture professionals
net domestic flows: business and finance professionals

Net Migration Rate (per 100 workers)
**net domestic flows:** natural and applied science professionals

![Bar chart showing net migration rate per 100 workers for various Canadian cities.](chart.png)
net domestic flows: arts and culture professionals
**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**

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Creative</th>
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</thead>
<tbody>
<tr>
<td>Unemployment Rate</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affordability</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td></td>
<td></td>
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<tr>
<td>Patents per 1000</td>
<td>√</td>
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<tr>
<td>PhDs per 1000</td>
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<td>√</td>
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<tr>
<td>% Post Secondary +</td>
<td>√</td>
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<tr>
<td>% Bachelors +</td>
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<tr>
<td>% Foreign Born</td>
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<tr>
<td>% Bohemians</td>
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<td>√</td>
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<tr>
<td>% Same Sex Couples</td>
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<tr>
<td>Critical Mass</td>
<td></td>
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<tr>
<td>Industrial Diversity</td>
<td>√</td>
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<tr>
<td>Occupational Diversity</td>
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<tr>
<td>Cultural Diversity</td>
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### Net Domestic Flows: Quality of Place Characteristics

<table>
<thead>
<tr>
<th>Unemployment Rate</th>
<th>Business &amp; Finance Professionals</th>
<th>Natural &amp; Applied Science Professionals</th>
<th>Arts &amp; Culture Professionals</th>
<th>Chefs and Cooks</th>
<th>Construction Trades</th>
<th>Manufacturing Assemblers</th>
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<tbody>
<tr>
<td>Income</td>
<td>✓</td>
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<td>Affordability</td>
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<td>University</td>
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<td>Patents per 1000</td>
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<td>PhDs per 1000</td>
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<td>% Foreign Born</td>
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<td>% Bohemians</td>
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<td>% Same Sex Couples</td>
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</tbody>
</table>

**Critical Mass**
- Industrial Diversity: ✓
- Occupational Diversity: ✓
- Cultural Diversity: ✓

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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