Cross-City Sector Perspectives
Engineering, mining, oil and gas

Calgary and Saskatoon

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Thesis

- Resource sectors are backbone to national economy
- Innovation not sustaining resource industries
- Theory is contradictory
- Evidence is weak
- Policy options vary
Resources and Canada

- Resource development core part of Canadian historical development
  - Extraction, processing and distribution of oil, gas and minerals remains major part of Western Canadian economy (BC-08)
    - >30% of AB GDP in 2008
    - ~14% of SK GDP in 2008
- Resources subject to boom bust
  - generate significant income
  - BUT declining real effect
Character of the city (CMA)  

Calgary

• Oil/gas industry dominant actor.
  – “you can’t start a business here not connected to oil and gas’
• City area produces little to no oil or gas.

• The industry concentration
  – (85% of headquarters of Canadian energy companies) based on a knowledge platform of managerial, technical, and financial knowledge that governs resource extraction in AB hinterland and globally.

• A platform is one of related knowledge rich in engineering, IT, finance – city employment rates high in ‘diversity’ but talent is concentrated on oil/gas activity.
Character of the city (CMA)  

**Saskatoon**

- Mining a secondary industry  
  - It generates value and jobs but does not define the city

- City area produces potash and is home to uranium miners, but only managerial value added in CMA

- The industry concentration  
  - Headquarters of uranium ( Cameco, Areva and about 50 exploration companies), potash (PCS, Mosaic, BHP Billiton) and gold (Shore)  
  - Centre of diamond exploration and assaying

- Platform for professionals in engineering, IT, finance; limited entrepreneurship
Change in GDP/employee
1997-2008

<table>
<thead>
<tr>
<th>Province</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>-42%</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>-43%</td>
</tr>
<tr>
<td>Canada</td>
<td>+11%</td>
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</tbody>
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Source: Author’s calculations using Statistics Canada data

Governments focused on employment and not productivity (BC-08)

Employment up more than 50% in 1997-08 in both provinces

Of course, the western numbers are dominated by the denominator, GDP - see the resource prices.
<table>
<thead>
<tr>
<th>Industry</th>
<th>Calgary</th>
<th>Saskatoon</th>
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</thead>
<tbody>
<tr>
<td>Oil industry</td>
<td>Highly competitive; regulated through royalties</td>
<td>• Pre 1990: few competitors; highly regulated; CIC, SMDC back-in provisions; SaskOil; coops</td>
</tr>
<tr>
<td></td>
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<td>• After 1990: privatization; loose regulation and more competitive royalties</td>
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<tr>
<td>Mining industry</td>
<td>Mix of large and small competitive firms</td>
<td>• Pre 1990: State monopolies (SMDC; PCS)</td>
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<tr>
<td></td>
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<td>• After 1990: privatization; rising competition</td>
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Dueling Theories

• Dutch disease (The Economist, 1977): resource booms drive out other sectors or activities with lower realizable returns (BC-08: ‘rip and ship’ mentality)

• Monopolies/oligopolies:
  – Transfer technology via GFCF
  – Generate forward and backward linkages (clusters) but BC-08 concludes linkages weakened
  – BUT tend to generate iterative but not transformative technological change
  – AND may not able to anchor effectively innovation systems to systematically sustain creativity
Evidence

• Weak data on innovation in resource sector (BC-08)
  – Invisible to standard economy indicators (SR&ED)
  – Most innovation on-site and not counted
  – Lack of understanding of motivation for innovation

• With few exceptions, Canada no longer global technology leader; firms ‘climbed down value chain’ (BC-08)
  – Wireless technology was previous spin-off (Langford et al ’03)
  – Some leading technologies: EOR/horizontal drilling; heavy oil extraction; remote mining (U3O8)
Evidence

- Mostly positive history of government industry articulation (BC-08)
  - outcomes based regulation (oil); integrated fed-prov EIA of 7 operations; uranium development process (Poelzer ’10)
  - flow through shares; capital pools; partnership agreements with FNs
- Significant managerial and professional capacity (BC-08)
  - contributes to community development through actions of ‘creatives’; entrepreneurial creativity positively correlated with community involvement; professional creativity is not (Sk/Webb ’09)
  - limited learning from other sectors (Sk/Phillips ’09)
Policy (BC-08)

• Need to re-engage resources as part of the broader innovation strategy
• Exploit ‘adjacent possibles’ within and beyond the resource value chain
• Develop and diffuse innovative business models
• Facilitate supply chains to diverge from global norms
• Promote agility over firms size and economies of scale
• Add value by changing both product and processes
Challenge and opportunity - Calgary

- **Challenge** – exploit knowledge in Oil/Gas platform to diversify.
- **Examples** – distinct industries spawned by needs from oil/gas: emergence of wireless telecommunications, GPS cluster
- **Requirement** – productive entrepreneurship that avoids tendency of resource industries toward ‘rent seeking’ entrepreneurship (“rip and ship”).
Challenge and opportunity - Saskatoon

- **Challenge** – exploit knowledge in mining and add value to commodity
- **Examples** – exploiting new deposits (potash, diamonds, coal); adding value (uranium life cycle); sustaining head offices (PCS); managing FN relations
- **Requirement** – highly professionalized; now need more entrepreneurship
Conclusions

• Innovation/creativity studies need to engage more fully with primary, goods-producing industry in Canada

• Resource sector undervalued
  – Generates significant economic rents but currently a drag on productivity growth
  – Created leading technologies and institutions for own industry and as spin-off to rest of economy
  – Contributes to community engagement
  – Significant opportunities
References


Langford, C.H. Li B. and Ryan, C.”Innovation from an Oil and Gas Platform”, presentation to the ISRN Integrative workshop, Toronto, Nov. 2-4, 2009.


