

ISRN 12th Annual Conference, Toronto

Cross-City Sector Perspectives

Engineering, mining, oil and gas

Calgary and Saskatoon

Cooper Langford, University of Calgary

Peter W.B. Phillips, University of Saskatchewan

May 5-7, 2010

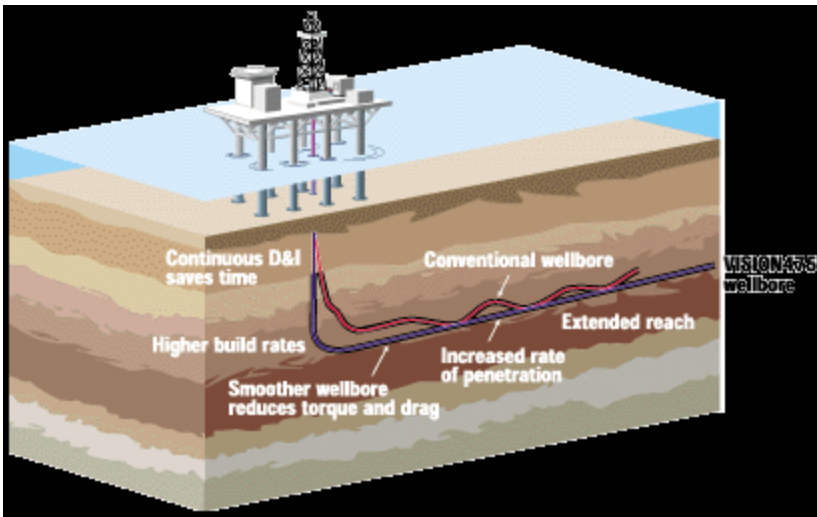


Thesis

- 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



VISION 475 wellbore



Cameco



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

Alberta	-42%
Saskatchewan	-43%
Canada	+11%
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.*

	Calgary	Saskatoon
Oil industry	Highly competitive; regulated through royalties	<ul style="list-style-type: none"> • Pre 1990: few competitors; highly regulated; CIC, SMDC back-in provisions; SaskOil; coops
		<ul style="list-style-type: none"> • After 1990: privatization; loose regulation and more competitive royalties
Mining industry	Mix of large and small competitive firms	<ul style="list-style-type: none"> • Pre 1990: State monopolies (SMDC; PCS)
		<ul style="list-style-type: none"> • After 1990: privatization; rising competition

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 be 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. Wood, J.R. and Ross, T. 2003. "Origins and Structure of the Calgary Wireless Cluster". Chapter 6 in Wolfe, D.A. ed. *Clusters Old and New*, McGill-Queen's Press, Montreal. P. Phillips and G. Webb. 2008. Talent, tolerance and community in Saskatoon. Presentation to the ISRN Annual Conference, Montreal, Que, May 1.
- 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.
- Phillips, P. and M. Kunz. 2009. Innovation and knowledge flows in the Saskatoon City Region. Presentation to the ISRN Annual Conference, Halifax, April 28.
- Phillips, P., G. Webb and M. Kunz. 2009. "If I had a hammer: The role of infrastructure in creative, innovative clusters and the community in Saskatoon." Presentation to the ISRN Annual Conference, Halifax, April 28.
- Phillips, P. 2009. ISRN Integrative Paper: The Saskatoon Case Study. Presentation to the ISRN Integrative Workshop, Toronto, November 2-4.
- Poelzer, G. 2010. Governance Structures, Bargains and Processes In the Saskatchewan Uranium Industry: 1970 – 2010 (MA Thesis).
- Thecis. 2008. The Banff consensus: The natural resource industries as engines of economic growth.
- Webb, G. 2009. Creative Social Entrepreneurs, Social Capital and Collaborative Governance: A Saskatoon based analysis (MA Thesis).