Forecasting rural employment effects from unconventional gas in Australia

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Local effects of unconventional energy extraction

- Expanding literature on this topic
- Sometimes represented as a hierarchy of effects
- The benefits are frequently overestimated by industry
  - E.g. Weber 2012, Marchand 2012
- We need more accurate forecasting
Boom/bust cycles... and mini cycles

• The mining/energy literature emphasises ‘boom-bust cycles’
  • High prices lead to intense new investment
  • When prices drop it collapses
• A little different for unconventional gas
  • Distributed operations across large areas
  • Wells may need repeated fracturing to keep producing
  • The pace of the industry ebbs and flows
• More like mini-cycles (Jacquet and Kay 2014)
Research objectives

• To develop more robust forecasts of indirect employment effects for Coal Seam Gas (CBM) industry in the Surat basin, Australia
  • Focusing on the operations phase (post construction)
  • Based on locally observed values
• Present forecasts under different scenarios
• Develop lessons for local businesses based on experiences so far
• Outreach: share with local communities and businesses
Methods: forecasting component

- Started with estimates for direct jobs prepared by industry
- Estimated indirect jobs based on multiplier ratios we developed for a previous project
- Formed the basis of 10 plausible scenarios
  - Industry slow down (25%, 50%, 75%)
  - With reduced multipliers
Methods: experiences of local businesses

• Conducted 31 key informant interviews
• Interviews took place after first down turn (mini-bust)
• Total of 31 interviews
• Participants came from:
  • Medium scale businesses (around 20 staff)
  • Local government
  • Regional development groups
  • Chambers of commerce
Direct employment: Energy Skills QLD 2015

Assuming 39K wells – State-wide workforce

Assuming 39K wells
Results: indirect local jobs, Surat Basin

*Assuming business as usual (BAU)
*Same multiplier as construction phase
Slow down scenarios

![Graph showing number of spillover jobs over time for different scenarios.](image-url)
Slow down scenarios

Spillover jobs from 25% reduced CSG direct employment
Slow down scenarios

Number of Spillover jobs

Sc SD1
Sc SD2
Sc SD3

Spillover jobs from 50% reduced CSG direct employment
Slow down scenarios

Number of Spillover jobs

- Spillover jobs from 75% reduced CSG direct employment

Sc SD1  |  Sc SD2  |  Sc SD3

2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034
Scenarios with reduced multipliers

Business as usual with 50% lower multipliers for construction
Scenarios with reduced multipliers

50% CSG Slow down and 50% lower multipliers for construction
Gradually reducing dependence on CSG over time

BAU with 25% Lower multipliers in all sectors (except recreation and administration)
Gradually reducing dependence on CSG over time

50% slow down with 25% Lower multipliers in all sectors (except recreation and administration)
Abrupt de-link from CSG

BAU with 75% Lower multipliers in all sectors (except for recreation and administration)
Abrupt de-link from CSG

50% slow down with 75% decrease in construction (and 20% increase in all other sectors)
All scenarios on same screen
## Projected changes by sector

<table>
<thead>
<tr>
<th>Industry sector</th>
<th>2006 jobs</th>
<th>2011 jobs</th>
<th>2014 jobs</th>
<th>Jobs from Scenario BAU 2034</th>
<th>Jobs from Scenario SD2 2034</th>
<th>Jobs from Scenario 3.3 2034</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity, gas, water and waste management services</td>
<td>591</td>
<td>798</td>
<td>1,250</td>
<td>1,167</td>
<td>1,209</td>
<td>↓ 1,002</td>
</tr>
<tr>
<td>Construction</td>
<td>3,577</td>
<td>4,350</td>
<td>6,650</td>
<td>6,291</td>
<td>6,470</td>
<td>6,769</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>2,679</td>
<td>3,215</td>
<td>2,950</td>
<td>2,623</td>
<td>2,787</td>
<td>↓ 1,971</td>
</tr>
<tr>
<td>Arts and recreation services</td>
<td>196</td>
<td>303</td>
<td>225</td>
<td>243</td>
<td>234</td>
<td>243</td>
</tr>
<tr>
<td>Other services</td>
<td>1,694</td>
<td>1,919</td>
<td>2,725</td>
<td>2,572</td>
<td>2,649</td>
<td>↓ 1,809</td>
</tr>
<tr>
<td>Administrative and support services</td>
<td>711</td>
<td>847</td>
<td>900</td>
<td>830</td>
<td>865</td>
<td>↓ 830</td>
</tr>
</tbody>
</table>
Results: summary of the lessons...

• 1. Look after core customers
  • Maintain existing loyalties
  • Short term price gouging is risky in the long run

• 2. Diversify
  • Companies which re-focus exclusively on gas were more exposed during down-turn

• 3. Understand the industry ‘ecosystem’ and where you fit
  • Supply chains are more complicated (multiple tiers of sub-contracting)
  • Large multi-nationals think/act differently from

• 4. Stay connected
  • Draw on resources available: e.g. regional development groups
Summary of the lessons...

• 5. Beware of possible risks
  • Contract conditions may be complex or unfamiliar

• 6. Be careful not to overcapitalise
  • Vehicles, equipment, IT and accounting systems...

• 7. Seek business advice early
  • People may not want to know what you're hearing

• 8. Check that your information is reliable
  • Be wary of spin

• 9. Consider personal implications
  • A boom/bust context isn’t for everyone

• 10. Position yourself ready for upturns

Video: https://www.youtube.com/watch?v=uLWouow5ts8
Conclusions

• Mini-booms and busts can vary under different scenarios
  • Particularly during the first 10 years (while still drilling)
  • Longer term upward and downward trends still visible

• Modest multipliers outperform higher multipliers in the long run
  • Effect of diversification

• Local businesses need:
  • Improved understanding of industry dynamics
  • More accurate information

• This poses challenges for governance processes
  • Better education of these issues
  • Correction of mis-information
Thank you

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