Mining and income distribution in regional Australia

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Overview

• Background on mining and the national economy
• Consider impact of mining on other sectors
• Methods: measuring income inequality with Gini co-efficient
  • A widely used measure of income distribution
• Show colourful maps and (plain) charts on this topic
• Conclusions about the relationship between mining employment and equality of income distribution
Mining is a big part of the national economy

- Mining is our largest export sector (by far…)

![Graph showing mining's share of exports from 1975 to 2010.](image)
Mining is not a huge employer

- Mining contributes around 6% to GDP
- And accounts for around 1.5% of the national workforce
Dutch disease in Australia?

• A mining boom is great for miners, but what about other sectors?
• Mining can cause impacts for other sectors e.g. by putting upward pressure on interest rates and currency
• ‘Dutch disease’ named from Holland in the 1960s following the rapid expansion of North Sea oil
  • Coincided with exchange rate increase
  • Other industries lose international competitiveness
• Other industries also affected by:
  • Higher wages and/or loss of staff
  • Higher operational costs (e.g. finance costs)
Dutch disease in Australia?

• We know that mining regions have higher salaries compared with non-mining regions (Baum et al. 2005)
• Much of this work is compares averages between regions (Hajkowicz et al 2011)
• But what about income distribution in mining locations?
  • Some may benefit while others are left worse off
• Income (in)equality as also a measure of well-being
  • How is this impacted by mining?
What is the role of gender?

• Gender plays a role in different labour markets
• Link to relative advantage/disadvantage of sectors (Stimson 2001)
  • These are spatially explicit
• Men and women may be impacted differently by the mining boom
Our hypothesis

• We set out to test the relationship between mining and income distribution

• Our hypothesis:
  • H0: Mining activity does *not* influence distribution of income in regional Australia
  • H1: Mining activity does influence the distribution of income in regional Australia
Methods: the Gini index of income distribution

- Gini coefficient represents the divergence from a totally equal income distribution.
Methods: the Gini index of income distribution

- Gini coefficient represents the divergence from a totally equal income distribution

![Graph showing Gini index with cumulative share of people (lowest to highest incomes) and cumulative share of income. The graph illustrates the concept of total equality and the Gini coefficient.]
Methods: the Gini index of income distribution

- Gini coefficient measured by the green shaded area
- A/(A+B)
- 0 - 1 index
Methods

• Looked at 2006 Census data
  • Initially for all statistical local areas (circa 1400 SLAs)
• Considered individual gross income for:
  • All persons, males and females
  • At place of usual residence
• Calculated Gini for each SLA in Australia (2006 Census)
• Compared with % directly employed in mining per SLA
  • Not considering services to mining in this analysis
• Also tested remoteness
• Excluded major cities
  • 781 non-metro SLAs
• Linear regression of Gini against % mining employment
• Using a restricted cubic splines model
Gini distribution (all persons)
Gini distribution (males)
Gini distribution (females)
Statistical results

- Mining has significant, non-linear relationship with Gini for males, females and all persons
- Remoteness has significant positive relationship to Gini
- We found differences between the regression scores of different states
- NB: Average for all SLAs Gini = 0.4
Non-linear relationship

Population employed in mining (%) vs Gini coefficient
It varies depending on how much mining you have...

- Groote Eylandt, N.T.
- Perry (West of Bundaberg), Qld
- Collie, W.A.
- Charters Towers, Qld, Muswellbrook, N.S.W.
- Belyando, Qld and Broadsound (Dysart), Qld
- Wiluna, W.A.
- Mount Isa, Qld
- Ashburton, W.A.
- Leonora, W.A.
- Roxby Downs, S.A.

Mean Gini = 0.4
Data exploration: gender differences

Population employed in mining (%)

Females

Males

Gini coefficient
Discussion

- State is significant
  - 4/5 highest mining locations (by employment) are in WA
  - All have relatively equitable income distributions
- As the proportion of workforce in mining increases there are more people on higher incomes
- Initially this increases inequality
- Eventually more people are on a higher wage so inequality decreases
- As you get into pure mining towns most people are on high incomes
- This holds true for non-metropolitan regions that supply labour on Fly-in Fly-out (or DIDO)
Conclusions

- Mining does influence the distribution of income
- The impacts are very different for men and women
- Overall, settlements with mixed economies and small numbers of miners tend to have less equitable income distribution
- Overall, settlements with many miners tend to have more equitable income distribution
  - Need to be careful how to interpret these results
- Need for further research
  - Consider how this effects particular towns
  - How does this change over time?
  - Are existing residents benefiting or being displaced (or both)?
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