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Demographic and economic impact of mining on remote communities in Australia

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ABSTRACT

The paper analyses the impact of mining on remote statistical local areas (SLAs) in Australia by comparing mining to non-mining SLAs and investigating changes emerging in the two types of SLAs from the resources boom. Specifically, differences are investigated for demographics, industry structure, human capital, income and wealth. Multivariate analyses of variance with main effects for the size of mining industry and interaction effects for census periods are carried out with 197 SLAs. The findings reveal that mining SLAs tend to have larger populations and workforce, fewer Indigenous people and lower unemployment. Mining SLAs have relatively smaller primary and social services sectors but a bigger construction sector. Human capital is greater with more residents having tertiary qualifications and technical occupations in mining SLAs. Incomes are higher and more equitably distributed in mining than non-mining SLAs. These differences widened between 2006 and 2011 during the resource boom.

Introduction

In 2012–2013, the mining sector generated more than half of Australia's total export earnings of $171.4 billion (ABS, 2013). Output from the sector amounted to $128.3 billion in 2011–2012, representing 7.8% of Gross Domestic Product. The sector paid $23.6 billion or 5% of total wages (ABS, 2013) and employed 195,000 people or 1.8% of total employment over the same period (ABS, 2013). While direct employment was low, the sector generated significant indirect employment in other sectors of the economy as well as income from company, personal and mineral resources rent taxes for the federal government and royalty payments to state governments (Blackwell and Dollery, 2013).

The Australian mining sector grew rapidly in the last decade, following the rise in demand for metals and energy from the fast growing Asian economies, especially China and India (Gregory, 2012; Garnaut, 2014). The associated growth in minerals and energy exports from about 2003 to 2012 has been widely described as a resources boom, and helped to offset the economic downturn that followed the global financial crisis in 2008 (Garnaut, 2014). Extensive new investments into mineral and gas production, particularly in Queensland and Western Australia (Measham et al., 2013) have fuelled high economic growth in these states (Stimson, 2011). Nonetheless, the positive contributions at the macro-level have occurred at various costs to mining areas, igniting a debate about the real worth of the industry to these areas (Wilson, 2004; Bloch and Owusu, 2012). Concerns about the potential negative impacts on regional communities have underpinned the development of 'royalties for regions' and other funding programs in Western Australia and Queensland, and may be a factor in opposition to further resource development (Windle and Rolfe, 2014).

It is acknowledged that there is a dearth of science behind the impact of mining on communities in Australia and that a great deal of work remains to be done to establish the net effects (Hamilton, 2010). Tonts et al. (2012), p. 300 emphasised the sparse research in this area, noting that their research had 'only begun to scratch the surface with regards to the complex interactions shaping the socio-economic performance of mining towns'. This paper addresses some of the gaps by investigating the demographic and economic differences between mining and non-mining areas in remote Australia. Specifically, it analyses differences with respect to demographics, industry structure, human capital, income and wealth to ascertain the extent of uneven development in regions brought about by the resources boom and how these effects have evolved over time. The paper makes contributions in several respects. It deviates from the case study approach that generally characterise research on mining to consider empirically, the bigger picture and inter-relationships among various facets of

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remote economies. It compares mining to non-mining areas and responds to the call to examine changes in economic performance of mining areas across time (Tonts et al., 2012).

For purposes of effective service delivery to all areas, Australia is categorised into regions based on the physical road distance of its SLAs to the nearest Urban Centre in each of five population size classes[2] (ABS, 2011). This paper covers the areas labelled 'remote' and 'very remote' in the Australian Statistical Geographical Standard (ASGS). The available statistics indicate that the remote regions of Australia have significantly lower socio-economic profiles compared with the rest of Australia, especially among the Indigenous population (ABS, 2008). For example, Baxter et al. (2011), Lewis and Corliss (2009), and the Regional Australian Institute (RAI) (2013) all note that issues such as lack of access to health services, low levels of education, poverty, large family sizes and poor infrastructure are more prevalent in the two remote regions of Australia than in the other regions. Despite this, the remote regions account for much of Australia's mineral wealth with large iron ore deposits and mining operations (DMP, 2013).

As well as comparing mining intensive against other regions, the research analyses changes over time by comparing regional differences between 2006 (shortly after the resource boom commenced) and 2011 (at the height of the resource boom). The paper is structured as follows: a theoretical foundation is developed in section *Identifying the key issues* followed by the research methodology in section *Research design* and presentation of the results in section *Results*. The results are discussed in section *Discussions and conclusions* which also covers implications of the research.

Identifying the key issues

Benefits of mining

Mining has the potential to improve the economic prospects of communities in remote Australia. Nonetheless, the complexity of issues surrounding mining makes it difficult to gauge its real impact on the region. Petkova et al. (2009) reported a number of benefits of mining including: population growth, increased income and demand for local goods and services, diversification of economic base, increased access to funding, improvement in infrastructure (e.g. roads, communication), and enhanced services such as in health. Lawrie et al. (2011) drew attention to improvements in socio-economic conditions and reduction in welfare dependency associated with rapid expansion of mining areas. Mining areas benefit from the skills and talents employed by mining companies and from global knowledge networks, technology and innovation (Martinez-Fernandez et al., 2012). Mining enhances the small and medium enterprise (SME) sector by generating income opportunities for the sector (Evans and Sawyer, 2009). Moreover, growth in economic activity and income of residents from mining flows to businesses and encourages their growth. Petkova et al. (2009) reported a rise in employee numbers, turnover and profits for small businesses in Nebo, Coppabella and Moranbah following the opening of mines, confirming that mining provides significant indirect employment (Garnett, 2012).

Despite these positive contributions, mining disadvantages the host communities in various respects (Scott et al., 2012). Rolfe et al. (2010) suggested that mining has limited multiplier effects for small towns. Hajkowicz et al. (2011) argued that socio-economic indicators point to a positive overall impact of mining. However, when the long-term socio-economic and environmental impacts are considered, it is unlikely that the net effect on mining areas will remain positive. Some of the potential adverse effects of mining are considered for testing in the following sub-sections.

Demographic impact of mining

Mining changes the demographics of remote Australia with populations moving or commuting from non-mining areas to work in mining areas. It is expected that mining SLAs will have larger working age populations from a high rate of in-migration, with more males than females and smaller Indigenous populations. However, the impact of mining on direct employment and demographic growth in mining areas has been tapered by fly-in fly-out (FIFO) programs. FIFO workers commute from regions outside remote areas, especially capital cities, to work for block shift periods on mining sites in remote areas (Measham et al., 2013). The majority of FIFO workers are male and are housed in temporary accommodation within or on the outskirts of the mining town (Storey, 2001).

The demographic imbalance caused by the influx of in-migrants (Petrova and Marinova, 2013), especially single males in their early working years (Mayes and Pini, 2010; Sarder, 2006), has potential adverse social effects (Lozeva and Marinova, 2010). Water, infrastructure, housing and other social resources are over-stretched, compromising quality of life (Rolfe et al., 2007; Halseth, 1999).

Mining also impacts negatively on low income groups who do not have the skills to secure employment in the sector. Their standard of living is further diminished by the rising cost of living (Sachs and Warner, 2001). In Australia, this applies particularly to Indigenous populations who tend to relocate to smaller less expensive towns (Scott et al., 2012; Lockie et al., 2009). The above discussion leads to the following null hypotheses:

H1a. There are no differences in demographics between mining and non-mining areas.

H1b. The demographic profile of mining and non-mining areas remained stable over the period of the resource boom, i.e. 2006–2011.

Impact of mining on industry structure

Workforce and industry structures are expected to differ between mining and non-mining areas. Vibrant economic activities point to lower unemployment and higher workforce participation in mining areas compared with non-mining areas. Industries that support mining such as construction and business services would be relatively larger in mining areas while competing industries such as agriculture and industries with low paid workers such as retail and services (Scott et al., 2012) will be smaller. The resources boom should widen these differences between the two types of areas.

In mining areas, social services can become inadequate when governments are unable to expand services to meet the needs of a rapidly growing population (Rolfe et al., 2007). Analysing the impact of mining on the small town of Boddington in Western Australia (population 2226 (ABS, 2011)); Petrova and Marinova (2013) observed that education facilities were inadequate and new facilities had not been built since large-scale mining recommenced. They reported that a significant number of workers commuted from the major cities to work in the mines so their children can access

[2] The Australian Bureau of Statistics is the organisation charged with collecting data on all aspects of the economy including households and businesses (statistical units). Statistical units are assigned to a geographical area to allow for understanding and interpretation of their geographical context. The remoteness structure allocates statistical units to geographic areas defined by their distance from the main population centres identified by the census conducted every five years; the last was in 2011. The main population centres are the greater main capital cities. Distance from these centres determines whether a statistical unit is located in one of seven remoteness areas: main cities; outer regional; inner regional; remote; very remote; offshore, shipping and migratory; and no usual address.