ENG417 Sustainability

Shane Reynolds

Role Play 1: Australia's Legacy Mine Sites

Background

Following the Global Financial Crisis of 2007, budgets are cash-poor but Australia's mines have left, and will continue to leave a legacy of waste and potential pollution that will require rem

What stages of the mining life cycle pose environmental risk?

- Extractive mining operations are typically environmentally adverse and can deposit waste rock, tailings, acid mine drainage, airborne dust, and other contaminants on the land, in the air, and in the water [1].
- Mines, unlike other production industry, typically have a finite life span, which concludes when the natural resources are depleted. The life cycle of a mine can be broken up into 6 phases: exploration, feasibility, planning and design, construction/commissioning, operations, and decommissioning and closure. [2]
- Mine closure carries high social and environmental risk if proper rehabilitation is not carried out. Rehabilitation is the process used to repair the impacts of mining on the environment and can include: backfilling open pit voids or filling voids with groundwater; covering ore with a layer of clay to prevent sulfuric acid run off; or re-establishing native vegetation. [3, 4]
- Commodity prices can be volatile and negative fluctuations may result in unprofitable operation. In response, mines often transition into an ancillary low cost holding phase referred to as *Care and Maintenance*. This allows the mining company to mothball the operation until commodity prices recover. [3, 4]

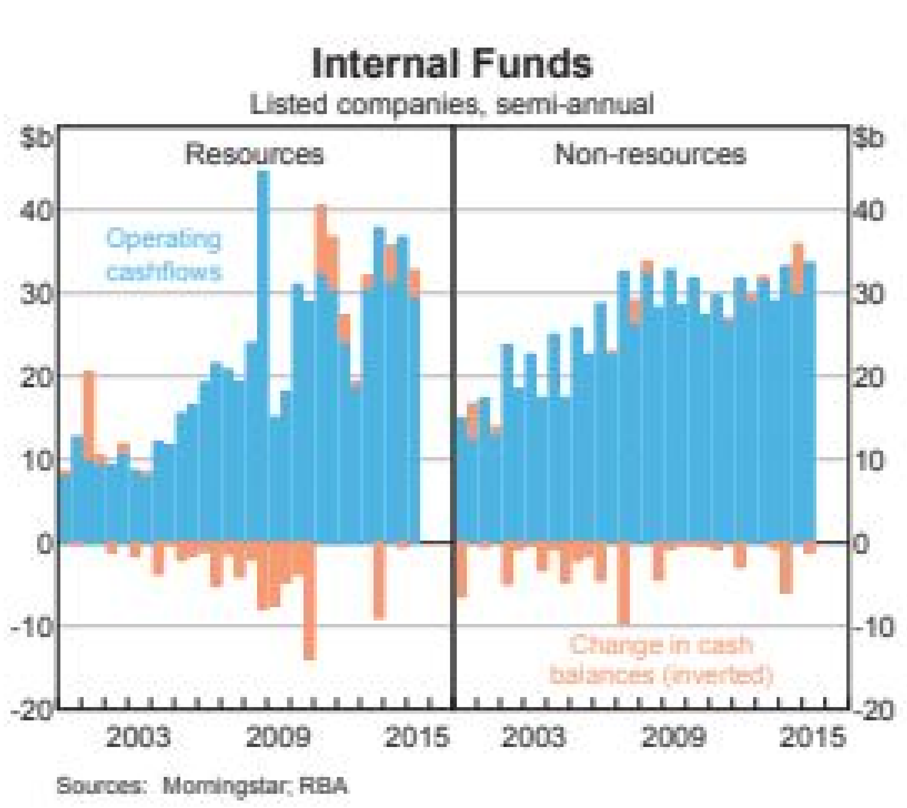

Figure 1:Operational cash flow timeseries.

What is the current regulatory environment?

- The Australian Federal government is not formally involved in managing mineral resources activity, but can intervene if justified under the Environmental Protection and Biodiversity Conservation Act. [5]
- State and Territory environmental legislation regulate air, water, land, and noise pollutions. Additionally, they are responsible for the protection of flora and fauna. [6]
- Although the States and Territories administer differing environmental legislation, there are some common aspects. For example, most governments use bond instruments to secure funds from the mining company, which provide guarantees for rehabilitation scheme execution should the mining company face insolvency. [7]
- More recently, some states have established rehabilitation funds, which mining companies are mandated to contribute to regularly according to the estimated cost of their rehabilitation plan, or as part of the royalty due from mineral extraction per tonne. [8]

Is there any evidence of mining companies behaving badly?

- Historically, it has been common for Australian mines to be abandoned when mining ceased, given there was no legal requirement for rehabilitation. In recent times, Australian public appetite for environmentally concious decision making have led State and Territory government to introduce legislation to ensure mining companies are legally responsible for rehabilitating mine sites once mining is complete. [9]
- It must be acknowledged that there are a significant number of abandoned mines from times of pre-rehabilitation legislation, however, there is disappointing evidence to suggest that mining companies do not take rehabilitation seriously, and abandonment persists as an issue. Additionally, whilst there are legitimate cases for the ancillary *Care and Maintenance* phase, there appears to be increased usage of this phase to defer rehabilitation indefinitely. [3, 4]
- In many cases, when rehabilitation does take place, the quality of the outcomes have been poor. [10]

Argument Summary

Despite greater public appetite for environmental protection, and stricter legislative requirements requiring rehabilitation of closed mines, there is evidence that mining companies are not taking these responsibilities seriously, or worse, circumventing the rehabilitation phase indefinitely. Bond instruments and, more recently, rehabilitation funds provide some assurance that rehabilitation will be undertaken, but there may be scope to regulate further in this space. Generally, mining companies have strong operational cash flows both from a historical perspective, and when compared to other industries. This places them well to absorb additional regulatory burden. Concerns about the loss of economic activity in the mining sector due to increased regulation may be overblown as studies show decisions on mining company operational location places more emphasis on political and economic stability (in addition to geological resources), compared to the level of environmental regulation.

Are Australian mining companies cash poor, or in financial duress?

- The Global Financial Crisis coincided with an increase in mining company cash balances as the appetite for risk dried up and investment spending fell, shown in Figure 1. [11]
- Commodity prices recovered in 2011 which saw renewed investment which was in part funded by cash rich balance sheets. More recently statistics have been published showing that the top 50 mid-size mining companies operating cash flows are up by 35%. [12]

Does imposing overly restrictive regulation reduce economic activity in the mining sector?

- Environmental regulation is required to control pollution, however, this increases operational costs for mining companies. This relationship may suggest that a by product of reduced economic activity may result. [13]
- Studies have shown, however, that geological potential and overall political stability rank as higher interests over environmental regulations, when deciding on mining operation location. [14]

References

[1] A. F. Widerlund and B. Ohlander. *Environmental Aspects of Mining.* Lulea University of Technology, Sweden, 2014.

[2] Tourism Department of Industry and ACT Resources, Canberra. *Mine Closure and Completion.* Australian Government, 2006.

[3] Linqvist J. Browne B. Swann T. Campbell, R. and M. Grudnoff. Dark side of the boom (nsw). February 2017.

[4] Linqvist J. Browne B. Swann T. Campbell, R. and M. Grudnoff. Dark side of the boom (vic). July 2017.

[5] R. H. Chambers. *An Overview of the Australian Legal Framework for Mining Projects in Australia.* Chambers and Co., 2007.

[6] Blake Dawson. *Mining in Australia: An Introduction for Investors.* 2011.

[7] Department of Mines and Petroleum. *The Administration of mining securities for mine sites regulated by the Department of Mines and Petroleum.* Government of Western Australia, 2018.

[8] Department for Energy and Mining. *Extractive Areas Rehabilitation Fund (EARF).* Government of South Australia, 2018.

[9] Tourism Department of Industry and ACT Resources, Canberra. *Mine Rehabilitation; Leading Practice Sustainable Development Program for the Mining Industry.* Australian Government, 2006.

[10] Erskine D. Lamb, D. and A. Fletcher. Widening gap between expectations and practice in australian minesite rehabilitation. *Ecological Management and Restoration*, 16(3):186–195, September 2015.

[11] Kosev M Fanf, A. and D. Wakeling. *Trends in Australian Corporate Financing.* Reserve Bank of Australia, 2015.

[12] *Aussie Mine 2017.* Price Waterhouse Coopers, 2017.

[13] Soderholm P. Pettersson M. Svahn N. Viklund R. Soderhold, K. and H. Helenius. *Environmental Regulation and Mining Sector Competitiveness.* Mining and Sustainable Development, 2015.

[14] L. Tole and G. Koop. Do environmental regulations affect the location decisions of multinational mining firms? *Journal of Economic Geography*, 11:151–177, 2011.