REGIONAL AUSTRALIA INSTITUTE

Transitioning Regional Economies

Contribution to a study on the transition of regional economies following the resources boom

Submission to the Productivity Commission Study
15 February 2017

FOR THE GOOD OF AUSTRALIA

Lvl 2, 53 Blackall Street
Barton ACT 2600

PO Box 896
Canberra ACT 2601

02 6260 3733
regionalaustralia.org.au

Submission

Table of Contents

1. Executive Summary 3

2. Context 5

3. Which regions are affected by mining? 8

4. Labour mobility 15

5. Facilitating transitions 21

6. Recommendations 29

Endnotes 30

1. Executive Summary

Key points

- Data gaps and time lags are inhibiting identification of transitioning regions.
- Succesful transitions can have several paths so a single metric may not work.
- Mining labour movements have been much larger than construction labour movements.
- The mining industry is highly mobile, spreading the geographical impact of boom bust cycles. Construction is less so.
- The split between mining labour source regions and mining labour host regions has broadened, and both are subject to transitional forces and will require appropriate policy and program responses to facilitate their transitions.
- Mining industry labour mobility needs to be considered in the context of broader patterns in internal migration in Australia and non-work drivers of worker relocations to ensure effective transitions.
- Endowments of non-economic factors have a significant impact on regional transitions, such as regional leadership, networks and connections.

Economic development in Australia has evolved under a wide umbrella of cycles of boom and bust. From gold mining to cedar harvesting to wool production and now minerals and energy, regional economies in Australia have become used to cycles of growth and decline in reaction to a host of predominantly external drivers.

The Productivity Commission's study into transitioning regions is timely, as it is clear that data gaps and data delays are hampering our ability to recognize, predict and manage these transitions. Successful transitions minimise the adjustment costs borne by regional and national economies, and are a key policy goal for states and the federal government. The Productivity Commission's analysis should help us understand the regions most sensitive to future transitions, and the scenarios that will trigger those transformations, identifying transitions and what success looks like under different scenarios. The study should be a powerful influence on policy and program design leading into the 2017-18 Federal Budget.

The Regional Australia Institute (RAI) submission focuses on three aspects:

1. Mapping the interconnections between regions impacted by the mining and construction boom;
2. Understanding labour mobility; and
3. Approaches to facilitating transitions.

On the first aspect, mapping the connections, the RAI's analysis shows that long distance commuting is spreading the impact of the mining boom, widening the spatial impact of the boom-bust cycles. We have identified 16 regions which are significant suppliers of mining labour, but which host very few mining industry jobs themselves. These mining 'dormitory towns' are mostly located in Western Australia, along with the Upper Spencer Gulf and Hunter Valley, will experience a similar scale of transitional

friction in their labour markets as will the regions hosting mine sites themselves, and need to be considered as part of any successful transition.

Secondly, labour mobility has an important role in transitioning regional economies. The RAI's research shows that job availability is one of a package of drivers of labour mobility, with community infrastructure and social connections also important influences on the decision to relocate. This indicates that labour market issues need to be seen in a broader regional socio-economic context – ie wage adjustments alone are unlikely to drive efficient labour relocations. Broader patterns of internal migration are also influencing the ability of regional labour markets to adjust.

Thirdly, there is a solid literature documenting experiences and practices in regions making significant economic transitions. The evidence is strong that while economic endowments are important, so too are non-economic endowments of regions including social, cultural and political capital. The RAI has found that while these are often loose terms, there are some proven approaches to influencing, improving and measuring outcomes – so that these non-economic factors too can be incorporated into strategies to facilitate successful transitions. Many authors go further, arguing that without due consideration of these factors, economic measures alone will not deliver the results required.

Recommendations

1. That this study be used to compile a better data set to identify boom-bust cycles in regions, and that this be publicly available.
2. That comment be invited on the economic metrics developed.
3. That this study clearly articulates how a successful transition can be identified.
4. That this study clearly articulates the scenarios which will underpin the assessment of regions' ability to transition successfully.
5. That due consideration be given to regions where a high proportion of residents are employed in mining, but which are far from mine site locations.
6. That mining industry labour mobility be assessed in the context of broader (internal) migration trends in Australia.
7. That due consideration be given to non-work factors driving labour mobility.
8. That the study includes analysis of best practices in managing services and economies in communities that are losing population.
9. That the study give due consideration to non-economic factors influencing capacity for successful transitions.

2. Context

Economic development in Australia has largely followed the use and export of natural resources – echoing the Canadian 'staples thesis'[i]. These natural resource products have always been subject to significant supply, demand and price fluctuations, so that Australian history has seen many cycles of investment and output booms and busts in related industries. The last mining investment boom is the latest of these cycles.

The Productivity Commission study aims to gather economic data and develop economic metrics in order to identify Australian regions less likely to transition out of the last mining investment boom – those regions 'failing to adjust' or less likely to make a 'successful transition'. The Commission has been asked to look at the factors behind successful transitions, including issues around labour mobility, and to develop a framework for assessing the scope for economic development in regions with similar characteristics.

This submission from the RAI presents new analysis on labour flows and mining regions, synthesises other work on labour mobility, and sets out the important economic and non-economic tools for facilitating transitions.

The RAI's first response to the brief is to note that we have some experience with regional economic data, and have found that it is not always easy to identify investment cycles from available data. Most nationally available data focuses at best on the local consequences of a boom (like higher costs such as short term accommodation and wages) rather than on the drivers and indicators of the boom itself (such as increased capital investment). And what data we have is usually lagging significantly, so identifying the position of a place on the lead into or out of a boom early enough for a policy response is challenging. So a key factor in mapping these places is better data on the leading indicators of a cycle.

Recommendation 1. That this study be used to compile a better data set to identify boom-bust cycles in regions, and that this be publicly available.

Secondly, it is challenging to define a successful transition. Success might mean a return to pre-boom equilibrium, or pre-boom prices, or might mean a stabilisation of employment or output growth at 'sustainable' rate – ie rates that, like the national economy growth/inflation trade-off enable a region to grow without abnormal price growth. A successful transition could take several forms:

- A return to the pre-boom equilibrium (resistance to change)
- Adjustments in economic activity (resilience)
- Movement to a different economic mix (transformation)

Which of these paths is determined to be a successful transition will have a significant impact on the economic metrics associated with success, and a single metric may well not be able to capture different types of success or failure.

Recommendation 2. That comment be invited on the economic metrics developed.
Recommendation 3. That this study clearly articulates how a successful transition can be identified.

Thirdly, it is not clear from the study's Terms of Reference what external influences need to be considered. In assembling economic metrics of capacity to transition, it is important to account for the nature of the external shocks that will be driving the transitions. The factor endowments in a region will support different transitional pathways in response to different external shocks. Mineral and energy price increases, for example, will influence some regions more than others, while international price falls will also impact on a different set of regions (depending on their exposure to international markets and the life cycle of the resources deposits they host, for example). In the absence of agreed scenarios on what the external shocks will consist of, it will be difficult to assess the capacity of region to transition. This conundrum is akin to the difference between generalised resilience in studies of social-ecological systems, and specified resilience. The former seeks to assess a system's *overall* adaptive capacity in general terms, while the latter seeks to assess its capacity to adapt to a *specific change* in drivers. The RAI suggests that the Commission's analysis will be more meaningful and relevant for regions if these scenarios are defined, so that specific aspects of transitions can be assessed.

Recommendation 4. That this study clearly articulates the scenarios which will underpin the assessment of regions' ability to transition successfully.

RAI submission

The RAI has undertaken analysis on three specific issues which we hope will augment the core work of the Commission in its work on this study. We have drawn on our internal resources (data and analysis) to present work on:

1. Identifying regions for which mining has been a significant employer, but which are far removed from mine sites;
2. Drivers and constraints on labour mobility; and
3. Factors which influence a region's ability to transition – which are not based on natural or economic endowments.

Mining worker source regions are easy to miss in analysis of industry transitions, and we hope our analysis demonstrates a methodology for identifying these places and the scale of impact they too are likely to experience from the end of a boom cycle.

Labour mobility is one of the key areas of frictional costs in navigating a transition. The ease and speed with which workers can move locations, industries and occupations will be critical. Our work[ii] has found that a job is but one influencer on mobility in Australian labour markets, and we point to research which shows the influence of other factors which may enhance or inhibit labour mobility. Our view is that facilitation of transitions will be more effective when this range of factors is understood and incorporated into transition strategies.

Experience with transitions shows consistently that while economic endowments play a role in framing the overall parameters of what the next economic state might look like, the path to a new economic state will be strongly influenced by the social factors embedded in the region. These include local leadership, networks and connections; social and cultural strengths and weaknesses; and the ability of a region to drive initiatives to support endogenous growth in alternative industries. In each case, though, the impact of these 'intangible' endowments will vary according to the nature and scale of the transition being experienced – so the region's adaptability will be different depending on the nature of the drivers that

are changing. Inevitably, while generic factors can be identified, the actual ability of a region to transition will depend on the specifics of the challenges being faced.

Each of these three topics is explored in this report.

The RAI is pleased to see the Commission's emphasis on understanding data on transitions, and on analysing the data to prepare metrics of exposure to booms and busts and of capability to adjust. We expect the Commission and the association with the ABS on this important study to enable compilation of a powerful new dataset on regional endowments. The RAI looks forward to reviewing the draft report in April, as this will give a better indication of which types of transitions the Commission has identified, which scenarios are under consideration, and what the measures of success are.

3. Which regions are affected by mining?

In this section we will focus on issues relating to the impacts of mining cycles on regional communities that may not be obvious from traditional economic analysis of mining in Australia. We will examine:

1. Spatial differences between labour source and labour host regions
2. Worker flows
3. Mapping mining 'dormitory towns'.

This work shows the distribution of one aspect of the last mining boom – increased numbers of mining and construction industry workers. This information helps analysts understand the spread of geographic impacts, and to identify regions more susceptible to fallout from the investment downturn – regions that are located far from the site of extractive operations themselves. While the driver of work availability is common both in labour supply and labour demand regions, the policy response and adjustment paths will be different, and consideration needs to be given to tailoring analysis of transitional capacity to reflect these very different regions.

3.1. Spatial differences between labour source and labour host regions

Mining boom-bust cycles have significant, but varying impacts on regional economies in Australia. The regions are exposed to changes in commodity prices, exchange rates, and other external shocks; and as a consequence, there has been clear fluctuation in population in mining-dependent regions due to these changes in past decades[iii]. For example, Mt Isa and Whyalla have experienced boom-bust cycles, caused by changing commodity prices and business competitiveness. During the periods of downturn they had higher degree of population loss. The peak to trough of population were 34,000 to 20,000 in Mt Isa, while the decline in Whyalla was from 33,000 to 25,000. A more recent example is that after the most recent mining boom in Western Australia, labour markets changed. Not only has unemployment increased, but also migration flows have changed from into these regions to out of them[iv].

The resilience (sustainability) of these local areas to external circumstances depends on the extent to which these economies rely on mining, and how diversified these economies are. Thus, the extent to which they are affected by mining depends on how important a role the mining industry plays in each regional economy. The contribution of mining-related jobs is one of the main determinants of assessing the level of this economic diversity in regions. On this measure, there are three types of regions in terms of their relationship with mining cycles: **Host mining regions**, **Source regions of mining workforce**, **and Balanced mining-related labour markets.**

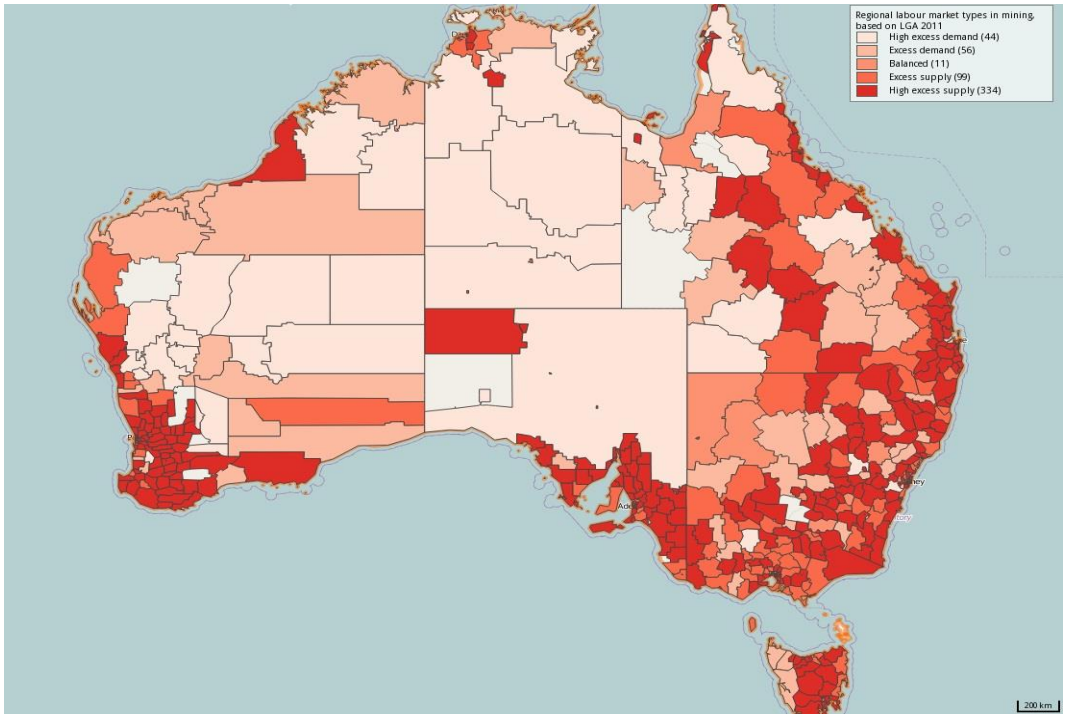
The split between regions that host mining operations and those which are a source for the mining workforce has become more marked in recent decades. At the same time, the state capital cities, especially Brisbane and Perth, have consolidated their role as mining towns through large numbers of jobs in direct mining-related businesses. Brisbane is known as 'Queensland's largest mining town'[v]. Current mining business models favour long distance commuting (LDC) over the 'company towns' which dominated the landscape in the 1960s and 1970s. Technological improvement in transport is one of the main drivers for the broadening the split as it enables the hiring of non-residential employees[vi]. In turn,

this change has broadened the geographical impact of mining cycles to areas far removed from the mine sites themselves[vii]. The nature and of these mining 'dormitory suburbs' is one of the streams of the analysis presented in this submission.

3.2. Worker flows

The scale of mining industry worker flows can be seen in the map below which shows the spread from high excess labour demand to high excess labour supply[viii]. In broad terms, the worker flows are from the coastal areas towards the mining areas in the inland of Australia (Figure 1).

Figure 1. Regional mining labour markets



Source: RAI, 2017 based on Census 2011

The RAI's approach to mapping excess supply and demand captures the difference between the number of mining workers living in a region and the number of mining jobs in a region. The index is the ratio of the number of mining jobs located in a region divided by the number of workers living in that region and employed in mining. Using this ratio (R) we classify labour markets into five groups:

1. high excess supply ($R<0.05$),
2. excess supply ($0.05<R<0.95$),
3. balanced ($0.95<R<1.05$),
4. excess demand ($1.05<R<2$), and
5. high excess demand ($R>2$).

Based on this breakdown, Figure 1 shows that most regions in southwest and southeast Australia have been providers of mining industry workers, while Northern Australia tends to be a provider of mining jobs. From the analysis, representative regions for each of these types are:

- **Host mining regions (excess demand):** Isaac (Bowen Basin in Qld), Cloncurry (Qld), Brisbane(Qld), Perth (WA), Leonora (WA) and Central Desert (NT)
- **Source regions of mining-workforce (excess supply):** Mackay (Qld), Central Highlands (Qld), Stirling (WA), Joondalup (WA), and Mandurah (WA)
- **Balanced mining-related labour market:** Mid-Western Regional (NSW) and Carpentaria (Qld)

Shortages of skilled labour in regions have fuelled these distinctions. As Queensland experienced strong growth in the resource sector, the mining employers in the Bowen Basin have recruited from other regions, Cairns, Mackay, Rockhampton, and Emerald while also employing local residents[ix].

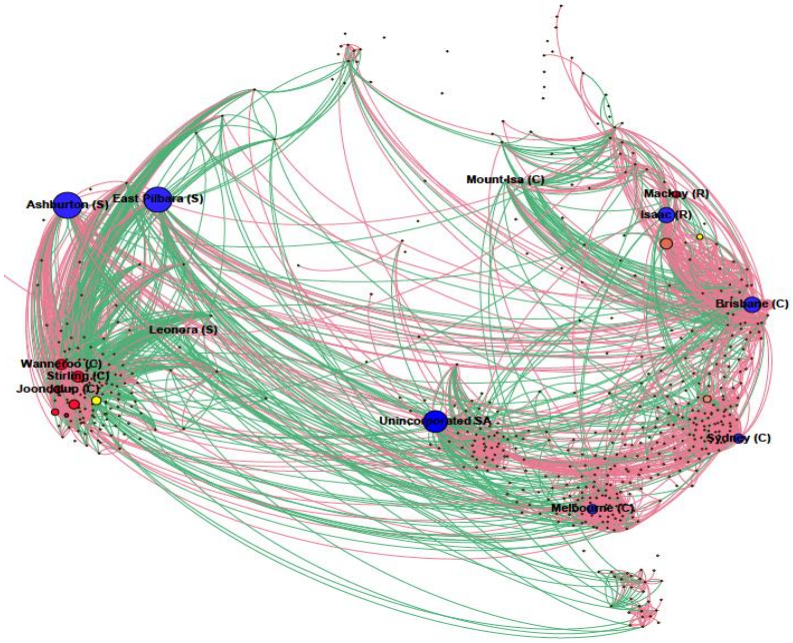
Implications

A focus of the terms of reference is identifying regions more vulnerable to unsuccessful transitions. This analysis shows that as well as regions that themselves host mine sites, there are many host regions for mining employment – including the capital cities of Brisbane and Perth. While these large cities have diversified economies and other growth options, that is not the case for some of the other host or source regions. This section also shows that there are many source regions well removed from mining operations which will be affected by mining industry cycles. It is important that these source regions are also recognised as facing significant transitional friction, and further details on the most vulnerable of these regions is presented in the next section.

3.3. Mapping mining dormitory towns

Long distance commuting is a feature of 21st century mining, and serves to distribute the impacts of mining across Australia. Figure 2 shows the pattern of LDC in Australia in mining and construction, emphasizing the length of travel. In the case of Bowen and Surat basins, many employees commute from coastal regions[x], and in the Pilbara many commute from southwest WA.

Figure 2. Regional labour flows in mining and construction industries



Source: RAI, 2017 based on Census 2011
Note: In the map, the red points are sources, the blue points are destinations, the red lines are for construction workers and the green lines are for mining workers.

The 2000s mining boom as predominantly a boom in capital investment in mine infrastructure, equivalent to a sizeable boost for the construction industry. The RAI's analysis shows that while there were long distance flows of construction workers in 2011, the flows for mining industry workers themselves were much larger[xi]. Overall, some 35,750 mining industry workers commuted over 100km in 2011 (25% of the total mining industry workforce), compared with 15,330 construction workers (2.8% of that industry's workforce).

While analysing the impacts of mining cycles on resource regions, we are able to identify regions strongly linked to mining, but which don't feature as places with a concentration of mining jobs. For quantifying the concentration of mining-allied labour in each region, as compared to the national level, we use the location quotient technique **(LQ)** [xii]. In this section, location quotients of employment in mining are measured in terms of both usual residence (UR – where workers 'usually live') and place of work (POW – location of employment), based on 2011 Census of Population and Housing. The location quotient highlights places with higher shares of employment in a particular industry than the national average.

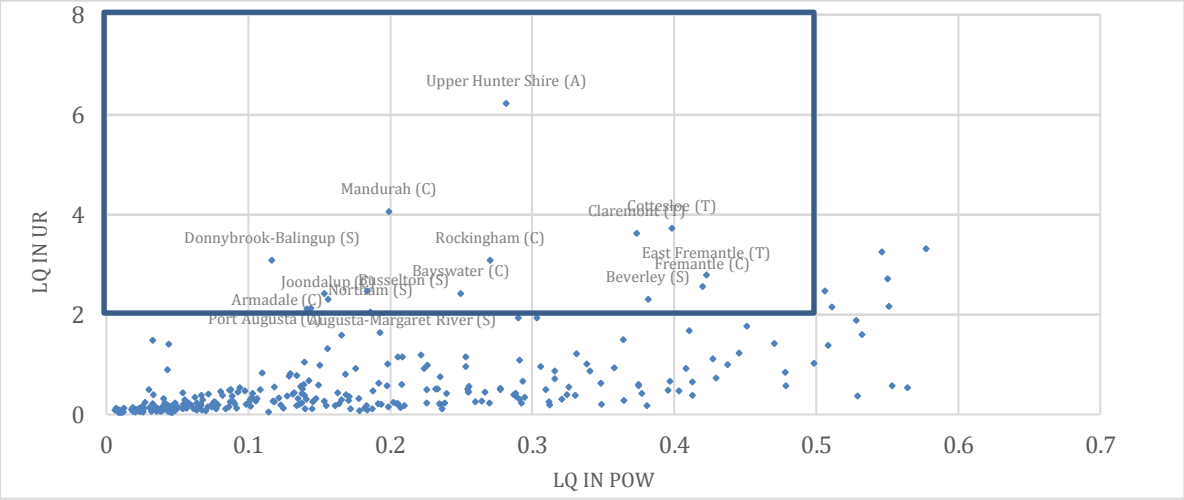
A region with LQ^{UR} greater than 1 means that employees living in this region are relatively more concentrated in the mining industry. In other words, the region is a source of mining employment.

In terms of place of work, LQ^{POW} indicates how the jobs in a region (filled by people living anywhere in Australia) are concentrated in mining or construction, compared to the national level. The regional economy with higher LQ^{POW} hosts relatively more mining jobs.

Generally, there is positive correlation between LQ^{UR} and LQ^{POW} which means that mining workers tend to live in regions where their jobs are located. In Queensland in particular, the Mackay, Gladstone, Townsville regions have both high shares of mining workers, and high shares of mining and construction jobs.

Of particular interest to the RAI is application of this technique to identify places with high reliance on mining employment – but which host few of these jobs. These are the mining 'dormitory towns'. In Figure 3 we identify these mining 'dormitory towns' by specifying that they have a high LQ in mining for residents (LQ^{UR} of 2 or more) and a low LQ in local mining jobs (LQ^{POW} of 0.5 or less). Imposing the threshold of LQ^{UR} over 2 means that these regions have more than double the concentration of mining and construction workers living there, compared to the national average. And imposing the threshold of LQ^{POW} below 0.5 distinguishes these places where the share of mining workplaces is less than half the national average.

Figure 3. Mining related regions by the degree of labour vulnerability to external shocks



Source: RIA, 2017

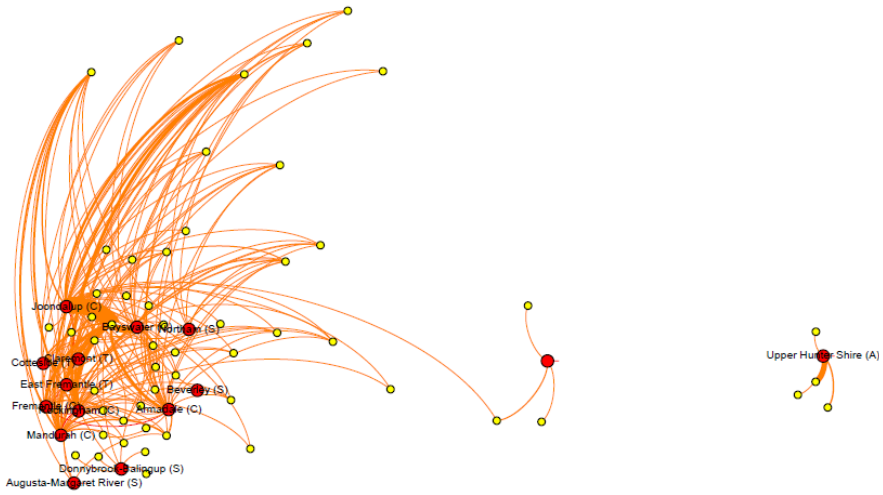
Figure 3 and Table 1 show that there are 16 local government areas (LGAs) which fall within the thresholds and are suppliers of mining workers, with a high proportion of mining workers in their local labour markets, but which host few mining jobs themselves. Most of these LGAs are located in Western Australia, along with Port Augusta LGA in the Upper Spencer Gulf (source region for mines in northern South Australia), and Upper Hunter LGA which is the source of many workers in the Hunter Valley coal mines. No Queensland LGAs feature on the list, because, while there are many places in Queensland that are the source of mining labour flows, these places also have a sizeable number of mining-related jobs within their boundaries – so they have a local mining base as well as being a source of labour supply and so do not meet both thresholds.

Table 1. Mining dormitory towns

LGA's Name	States
Armadale	WA
Augusta-Margaret River	WA
Bayswater	WA
Beverley	WA
Busselton	WA
Claremont	WA
Cottesloe	WA
Donnybrook-Balingup	WA
East Fremantle	WA
Fremantle	WA
Joondalup	WA
Mandurah	WA
Northam	WA
Rockingham	WA
Port Augusta	SA
Upper Hunter Shire	NSW

In Figure 4, below, we zoom in on these 16 places to see where the workers living in these places commute to. Figure 4 shows a mix of flows into Perth, as well as into the north-western WA iron ore and LNG areas. For Port Augusta, it shows that the region supplies workers into Roxby Downs and other areas in South Australia. While Upper Hunter Shire mainly provides workers to places nearby in the Hunter Valley such as Muswellbrook, Singleton and Mid-Western Regional.

Figure 4. Connections of major source regions of mining employment to host areas



Source: RAI, 2017

Conclusion

This analysis identifies places which are not usually thought of as 'mining towns' but where employment in mining is a big part of the local economy. These places will be experiencing as much transitional friction during this post-boom transition as host mining regions, demonstrating the high degree of interconnectivity of regional economies.

Mining industry transitional strategies will be as important for these areas as for the places that host the mine sites themselves, yet these places are usually absent from policy considerations. The methodology used should assist the Commission in addressing the terms of reference of the study, contributing to establishing economic metrics and the analytical framework for assessing the degree of economic dislocation, friction and interrelationships between host mining and source mining regions.

Overall, the impact of mining industry cycles in these places will depend on the mobility of the labour force – both in terms of the ability to move to other areas for work and to shift industries. We have focused on the geographical aspects of mobility, given the prevalence of long distance commuting in current mining practice. But the other aspect of mobility – changing between industries and occupations – is also important in successful transitions. This aspect will be influenced by the diversity of economic growth options in a region, and the depth of skilling and training capability in a region – both of which are quite well suited to measurement using the economic metrics that the Commission is examining.

Recommendation 5. That due consideration be given to regions where a high proportion of residents are employed in mining, but which are far from mine site locations.

4. Labour mobility

In this section we look into labour mobility, as the ease and costs of transferring workers and jobs is an important determinant of the costs of transition into and out of a mining boom. Labour mobility is important in transitions, and is a distinct issue named in the terms of reference. To contribute to the Commission's work on this topic, we draw on a body of work undertaken over several years by the RAI to look in detail into labour mobility issues in regional Australia.

In this section we present work on:

1. Drivers of labour relocation
2. Longer term population migration trends
3. Labour mobility in mining

This work shows that mining labour mobility is taking place within a broader context of internal migration in Australia, and that facilitating labour mobility requires consideration of other factors than just the availability or not of a mining industry job.

The RAI recognizes that geographical labour mobility is crucial for social and economic resilience. It has an important role in enhancing national and regional productivity and efficiency through encouraging labour markets across Australia to be balanced. Labour mobility is an important component of regional transition from the resources boom as it can strengthen the capacity of regions to adapt to the transition. Enhanced mobility can increase the value of labour productivity through efficient allocation of labour resources across Australia. This includes reducing the probability of being unemployed, raising the chances for employees to access better employment opportunity and for firms to become more cost efficient through hiring more productive or skilled workers.

But there are impediments to the economic efficiency of regional labour markets, with recent work documenting inefficiencies observed during cotton industry restructuring through boom and bust years[xiii]. The cotton industry work showed that in regional labour markets, the stickiness of workers to employers means that workers tend to stay 'too long' – ie past the economically optimal time for them to move on, and that similarly employers tend to hold on to employees longer than is economically optimal, in part through recognition of the frictional costs of recruitment at a later stage. The same work showed that the sponginess of regional labour markets means that job growth post bust is slow and that businesses often have a great capacity to absorb new business before adding to the number of workers. These attributes of stickiness and sponginess act to reduce the economic efficiency of regional labour markets.

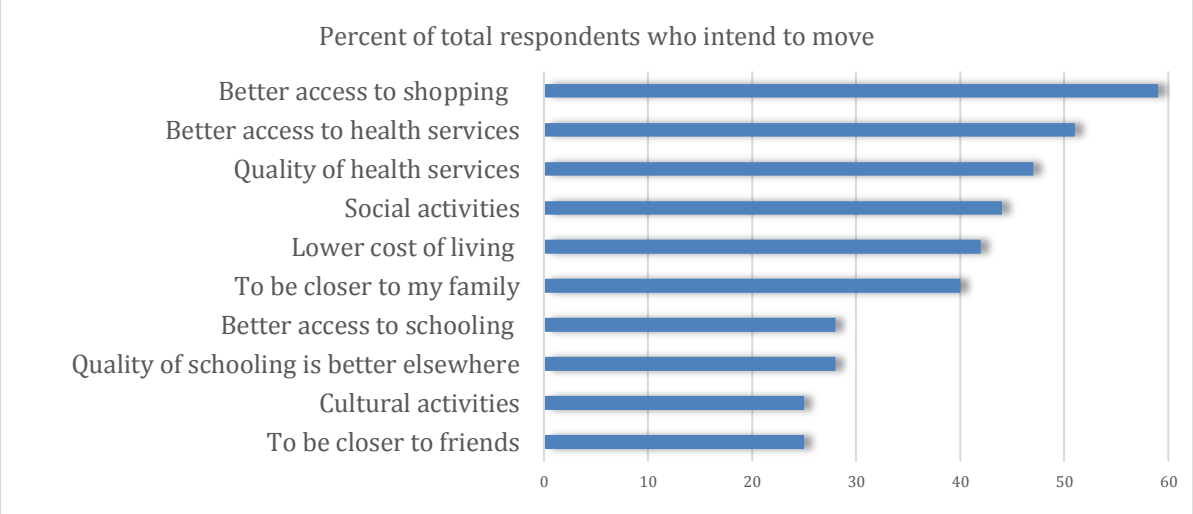
4.1. Reasons for geographical labour mobilization

Why people move is important to evaluating issues of geographical labour mobility. Work-related factors are commonly considered for determining labour movements, yet there are many other drivers than strictly economic measures or work availability and income. Lifestyle, family, social infrastructure and social connections all influence people to move. In earlier work the RAI found that key motivators are differences in job opportunity, expectations for the future, health and education services, living

conditions, climate and social connections[xiv]. The RAI work also demonstrates that people having low satisfaction about living in a place are more willing to move than unemployed ones.

A major survey undertaken in Western Australia where relatively higher labour mobility happened during the mining boom, shows similar results. The *Living in the Regions* survey covered people living in regions long term, new arrivals, and people who had left regions for other places. The survey found that work related reasons are likely to rank a low priority issue in the decision to move. Only one-tenth of those people planning to move said that their main motivation was earnings[xv]. Figure 5 shows that people are more likely to relocate for better shopping services, more accessible quality public services including health and education, engaging in more social and cultural activities, lower cost of living and family or friendship related reasons. On the other hand, those who migrated to the regions and intend to stay longer in the same place, prefer their lifestyle, job commitments, closeness to family, the quality of social life, social connection and career opportunities. It is clear that not just economic aspects but also social factors determine mobility decisions. Public and business services, as well as social connections, are taken into consideration while making decisions to move.

Figure 5 Main reasons for making decision to move



Source: Government of Western Australia (Living in the Regions: A survey of attitudes and perceptions about living in regional, 2013, p. 59)

Enablers and impediments

Beyond the mix of personal drivers of the relocation decision, there are enablers and impediments of migration. Work by the RAI[xvi] determined that key enablers are technological improvement, government policy, and efficient and faster ways to spread market signals. Advances in telecommunication and transport already allow people to commute long distances. Government actions can support labour mobility through correcting labour market failures including reducing the lack of labour market information and enhancing labour market equilibriums across regions. By efficiently providing adequate information on changes in labour market and business environments to stakeholders across regions, even remote areas, information asymmetries can be reduced and employees can access more and better opportunities, potentially reducing the duration of unemployment.

In contrast, there are **personal, institutional** and **structural barriers** to labour movement. **Personal impediments,** including having inadequate information about opportunities in other labour markets, and lack of market confidence is also likely to discourage a move to a new job[xvii]. In the Western Australian survey, the above-mentioned reasons why people don't intend to move also could be seen as barriers to labour mobility; these include better access to quality public services, close social connections, and more net income.

One of the main **institutional impediments** is poor transportation connections in some regions, as this precludes long distance commuting. Inefficient and inadequate labour market information systems across regions are likely extend the duration of unemployment[xviii]. As a result, a significant number of unemployed individuals still exist in local areas, dealing with disadvantages in both transportation connectivity and the local labour market.

Another major institutional barrier relates to licensing mandates and occupational licensing schemes. Current occupational licensing requirements hamper labour mobility across the states and territories through higher costs in acquiring multiple licenses and converting them into demands of local accreditation authorities. Though Mutual Recognition has tried to facilitate skilled employee migration since 1992, there are still some challenges arising from different occupational standards among jurisdictions[xix]. Thus, national licensing reforms are vital in improving outcomes of geographic labour mobility in regional labour markets.

In terms of **the main structural constraints,** workers who have low levels of income or education are less likely to change their location. Migration incurs significant resettlement costs in moving to a new place and finding a new job; thus, the individuals who earn less tend to have less chance to relocate[xx]. Similarly, for those who have lower qualification and skills, the net gain from their relocation or long distance commute is likely to be small due to lower initial wages.

4.2. Population movements

Understanding population flows across regions is important in investigating regional labour mobility. A nationwide analysis undertaken by the RAI in 2013 showed that Australia has one of the world's most mobile populations, which results in more chance of spatial job matching compared to countries having less mobile populations[xxi]. According to the study, 37.7 per cent of Australia's population moved their place of residence between 2006 and 2011; with approximately 70 per cent of these moving within their region.

To illustrate the locations of these geographical movements, Figure 6 shows how population changes have occurred across regions, while Figure 7 shows the directions of these movements. From these figures, it is clear that there has been high population turnover and population growth in Australia's regions, especially the mining regions. The mining regions in Western Australia and Queensland, including Ashburton, Roebourne and Port Hedland in Western Australia and Weipa, Isaac and Mt Isa in Queensland, had high population growth and turnover[xxii]. Also, both the highest population turnover and the fastest growing population occurred in the East Pilbara region in Western Australia due to the mining dominated economy.

Figure 6. Population growth and population turnover rates - Local Government Areas, 2006 to 2011,

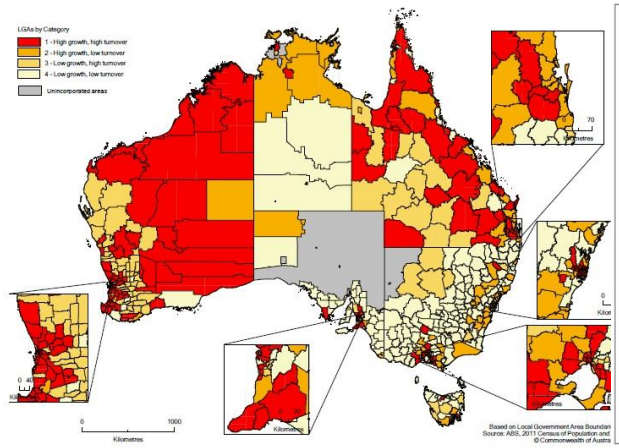
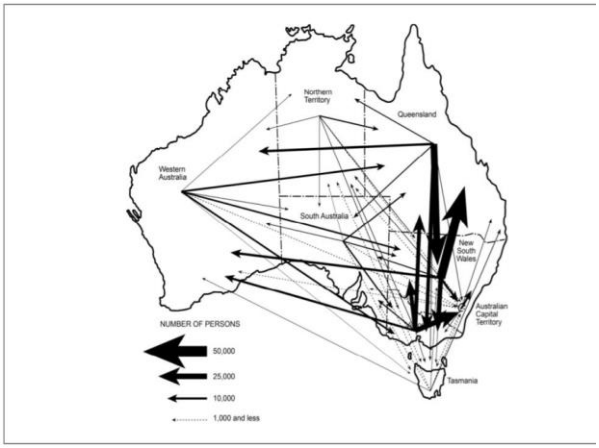


Figure 7. Population flows across Australia 2006-2011



Source: ABS (Population growth and population turnover rates - Local Government Areas, 2006 to 2011, 2014b) and RAI (2013)

Another pattern of these movements is that major population flows existed in East Coast of Australia (Figure 6). From New South Wales, the population moved mostly to Queensland, as well as inside the state and to Western Australia while Queensland's population migrates commonly to New South Wales, followed by Western Australia.

Regional returners

Another underlying component of migration and labour mobility in Australia is the phenomenon of 'regional returners', people who grew up in a regional area then left for work or study, and then returned later in life[xxiii]. These migration flows are a win for all concerned participants; as both returners and receiving communities gain benefits from this return migration. Returners believe that living in regional Australia they can access advantages including better lifestyle, environment, and open space, closeness to family, and lower relative cost of living. The regional communities where individuals move back gain people with new valuable skills and experience.

Regional returners demonstrate the mix of drivers underlying relocation decisions. Though there is not clear data to recognize who returns, the earlier work by the RAI estimated that returners accounted for a significant portion of total movers to regional Australia[xxiv]. Returners influenced by a post boom transition facilitate the transition as they bring new ideas and experience into the destination regional economy, bringing new market opportunities and ways and improving regional technological readiness.

4.3. Labour mobility in the mining industry

Labour mobility has always been high in the mining industry in Australia. From gold rush-induced migration in the mid 19th century to post Snowy scheme workers moving to dig for opals in Coober Pedy in the 1950s, mining has always underpinned the movement of people.

While population turnover data shows that there is high population movement in mining regions, a labour mobility survey undertaken by the ABS also shows that the mining industry itself has one of the highest rates of workers changing jobs[xxv].

Russian Jack, one of the many men who walked from Perth to the Goldfields.
Courtesy of West Australian Newspapers uncredited images from archival and contemporary sources.

In 2013, one-quarter of people who had worked for their current mining employer for one year or more changed their work, while the average for all industries was 18 per cent.

Table 2. Labour mobility by industry

Industries	2010		2012		2013	
	Changed employer/ business in one year[1]	Some changed in work in one year or more[2]	Changed employer/ business in one year	Some changed in work in one year or more	Changed employer/ business in one year	Some changed in work in one year or more
	% of total short term employment	% of total long time employment	% of total short term employment	% of total long time employment	% of total short term employment	% of total long time employment
Mining	73.8%	25.2%	70%	24%	70%	25%
Public administration and safety	55.8%	30.2%	55%	29%	58%	27%
Financial and insurance services	61.9%	26.4%	62%	27%	64%	23%
Education and training	45.9%	25.2%	49%	27%	55%	24%
Electricity, gas, water and waste services	74.7%	24.3%	69%	26%	60%	23%
Information media and telecommunications	52.3%	23.0%	71%	25%	58%	23%
Retail trade	37.9%	22.1%	42%	22%	40%	20%
Accommodation and food services	36.6%	21.1%	41%	24%	39%	21%
Construction	58.5%	10.5%	61%	11%	62%	9%
Average	**48.8%**	**19.7%**	**53%**	**21%**	**50%**	**18%**

Source: ABS 6209.0 - Labour Mobility, Australia

[1] Percent of number of people who had a job, but recently changed employer or business compared with the total number of those who had worked for their current employer/business for less than 12 months.

[2] Percent of number of employees with some change in work compared with the total number of those who had worked for their current employer/business for one year or more.

Nearly 70 per cent of people who had worked with their current mining employer for less than one year recently changed their previous workplace, while the national average for all industries was just about 50 per cent.

Clearly, the mining industry has always had a highly mobile workforce, and this continues in the current labour market. This culture of mobility will help underpin successful transitions, but will also be offset by the non-work drivers of location decisions – which tend to increase inertia, building a 'stickiness to place' that may not be economically efficient and may be a useful target for interventions designed to accelerate transitions.

Conclusion

Geographic labour mobility means that cycles in mining have impacts on not just host regions, but also source regions. The RAI's research has identified 16 regions which have high LQ for residents and low LQ for mining jobs. Of these, the most affected areas are Donnybrook-Balingup, Joondalup, and Rockingham in WA, with high proportions of the local workforce employed in mining and all commuting to work in other resource areas.

It is important to understand the role that job availability plays in worker location decisions. The research presented shows that it is not the only driver, and in fact ranks low in many surveys. This means that workers are less likely to want to move for work alone post-boom – adding significantly to the frictional cost of the boom–bust cycle. Furthermore, mining boom mobility needs to be seen in the context of the larger picture of migration in Australia – emphasising the importance of other factors than simple work availability. Mobility in mining is higher than in other industries, a sign that the frictional cost of relocation is already internalized by mining industry workers. But as a high proportion of mining workers had become residents of mining regions during the boom, the importance of the non-work drivers of location decisions mean that these workers are not all likely to relocate fast enough to optimise labour market efficiency.

Recommendation 6. That mining industry labour mobility be assessed in the context of broader (internal) migration trends in Australia.

Recommendation 7. That due consideration be given to non-work factors driving labour mobility.

5. Facilitating transitions

There are two broad sets of factors influencing the ability of a region to transition:

1. Economic factors
2. Non-economic factors.

Each of these are discussed briefly below, to highlight the interplay between the two and the importance of integrating interventions across both sets of factors in order to deliver real change.

5.1. Economic factors

There are many frameworks for assessing economic transitions. One relevant to the diversity of economic trajectories in regional Australia is based on the dynamics of population growth and industry diversification (Figure 8). This approach identifies the regions where populations are either growing, static or declining, and the where the industry mix is either diversifying, stable or narrowing.

Figure 8 Typology of population and diversification dynamics

Working population	Increasing	Growing around dominant industries, exposure to external shocks, **muscle town**	Growing and diversifying **thriving/reviving town**
	Decreasing	Consolidating around dominant industries – no structural adjustment **dying town**	Effective 'structural adjustment' **turnaround town**
		Decreasing	Increasing
		Employment diversity	

Source: Houghton and Fell 2011, p30

The typology recognises the importance of transitions in overcoming regional economic path dependencies and vulnerabilities, and the interplay with population growth. Growth in both population and economic diversity marks a region as thriving, or perhaps reviving from a period of change. Where population is increasing but economic diversity is not, a region is in the midst of a dominant-industry driven growth phase – the circumstances of the so-called 'muscle towns' which are satellites to regions of high investment in mining. Where population is not increasing but economic diversity is, a region is in the midst of a structural transition – shedding reliance on a dominant industry for growth in other industries, while still losing population as a result of reduced activity in the (formerly) dominant industry. Where neither the local population is growing nor the local economy diversifying a town or region is dying, as jobs dry up, people leave, and the flow-on employment base falls in consequence – the 'spiral of decline'.

This typology emphasis the mix of pathways a transition can take, and shows that there is no single 'best' path in all circumstances. While the 'dying town' quadrant is one to avoid, both diversification and population growth are seen here as means to an end rather than an end in themselves. The typology indicates that successful transitions can take place without economic diversification, or without growth in the working population.

It is worth noting that for 'dying towns', it is only recently that economists and planners have started looking at how to manage population decline gracefully and efficiently. Recent work in the US[xxvi] is looking at how to continue efficient delivery of public infrastructure as the boundaries of settlement shrink with population growth, and this should be a part of any package of skills and strategies designed to address transitions.

Recommendation 8. That the study includes analysis of best practices in managing services and economies in communities that are losing population

What works in supporting regional economic transitions?

Sound policies are needed to support regional transitions from the mining boom times to more broad-based growth. There is a wide range of regional development policy directions available, and in this summary of 'what works' in this space we contrast roles and expectations of neoclassical economics, which looks at transitions through a global or national lens and sees regional adjustments accordingly, with those of more overtly place-based economic policy.

A foundation of neoclassical economics is that in a global economy all regions converge eventually in terms of income per person. A core assumption is that poor regions have higher returns to capital, which leads over time to investment flows into these regions from richer regions. Also, due to migration to rich regions, wages are expected to be lower in the poor areas, another attraction for entrepreneurs. As a consequence, the disparities in personal incomes across regions are expected to disappear as markets adjust to price differentials over time.

While this may be the case in the long term, there are significant observed differences in economic performance across advanced economies[xxvii]. In particular, there is evidence that regional income inequality has not diminished in recent decades, and in fact has been widening in the USA and EU. While differences in incomes across American states between 1880 and 1980 reduced, incomes of regions again have become more divergent due to a mix of declining resources and a population shift from decaying areas to prospering ones or overseas migration[xxviii]. Though these labour market movements support overall economic growth and efficiency through improving resource allocations, the places left behind face mounting economic problems. A potential outcome for a declining region is entering a 'poverty trap' because the reduction in economic size and tax base negatively influences public service provision, especially education. Worsening education quality then has as a consequence severe impacts on job opportunities for young people, sending the region into a spiral of decline[xxix].

Some economists argue that bottlenecks in growth like 'restricted zone regulation' and 'inadequate infrastructure' in thriving cities limit the likelihood of this decline by imposing their own constraints on the growing regions. But removing these constraints is not the only solution for dealing with regional development because though this would enhance economic performance in the large cities, other regions would be left in the same position, potentially even worsening[xxx]. Meanwhile, in order to reduce regional income disparities, distributional policies including transfer and trade-protection have been suggested for supporting poor regions. While such measures might help in the short-run, they are likely to have long term negative impacts on economic growth and jobs.

Thus, policies that address not only redistribution but also encourage regional economic growth and job growth are needed to facilitate regional transitions. 'Place-based' policies are seen as being effective in addressing these issues. Examples include the Tennessee Valley Authority (TVA) in the USA and EU structural funds and economic zones. These approaches provide substantial infrastructure investment and address regulations with the aim of making the target regions more attractive destinations for investment, business and employees. There is still a valid 'beggar my neighbour' critique of place based policies though, as regionally targeted measures may support economic agglomerations and clusters in the target region, yet divert resources and inhibit growth in other regions. Also, a focus on increasing economic size alone has weaknesses, as agglomeration economies are not the only driver for economic growth – and indeed many of the world's largest cities are experiencing slower growth than other economically smaller regions, and than the national average.

Human capital is emerging as a key 'no lose' strategy to facilitate transitions[xxxi]. Some commentators argue that establishing academic and research hubs could be an effective way of supporting growth in struggling regions[xxxii]. Through providing cheaper or free land and infrastructure, it is possible that universities and research institutes could develop innovations which in turn strengthen their regional economies. Others argue that this is an inefficient approach with few measurable benefits to regions flowing from regional universities[xxxiii], though there is compelling evidence at a macro regional scale that raising human capital drives economic growth[xxxiv].

Recent work by the RAI has shown that incentives for research and development alone are not always associated with increased business and employment in regions. We mapped an index of R&D against an index of endogenous business activity and found that while in some regions these two co-exist, in many others they seem to be independent[xxxv]. Armidale Dumaresq, for example, scores well in R&D but weak on business outcomes, while Byron Bay and Warrnambool are weak on traditional R&D but strong on local business capability.

Long run investigations into what works in stimulating economic growth in European regions has demonstrated that regional policy has evolved from 'subsidy-based interventions' aimed at reducing regional inequality into a wider range of policies to support regional competiveness[xxxvi]. In most OECD countries, the main instruments of regional policy were wealth redistribution for equity and balanced growth and public investment, but the results of these approaches were ongoing regional inequality. The policy focus has changed to favour more endogenous growth models instead of exogenous transfers and investment. Participation in decision making has become wider, engaging not just central government but involving governments at all levels, alongside other stakeholders. Another key platform of this revised approach is that national output can be maximized through encouraging each region to make greater use of its own opportunity and potential – with a stream of this work actively supporting 'smart specialisation' to rebuild regions on growth in demonstrated economic strengths.

OECD review of 'what works' in terms of effective regional policies highlights:

- **Infrastructure**: Infrastructure is important for growth, but insufficient without internalized adequate human capital and innovation.
- **Human capital**: skilled labour is a main driver of growth.
- **Innovation and R&D**: Investment in R&D has positive impacts on regional economic prosperity, as well as spillover into other regions and even the entire economy, but takes time to develop and turn to economic advantage.

- **Integrated regional policies**: Inter-regional trade and inter-regional linkages, communication and knowledge sharing can also encourage regional growth. Also, regional policy consistency across regions is seen to be important.

Australian experiences

In the early 1990s Australia experienced major regional economic adjustments due to both structural changes and macroeconomic cycles. Since 1970, structural change in Australia has been pushing the economy towards more of a services base than its former primary and secondary base, and non-metropolitan regions faced more of this transformation than metropolitan regions[xxxvii]. In the regions relying more on mining, there were greater and more varied structural changes in employment, while there have also been steady reductions in employment in agriculture across almost all regions. The 1998 Productivity Commission Inquiry into *Aspects of Structural Change in Australia* found that changes in industrial composition had the greatest impacts on young workers, old workers, unskilled workers and workers from non-English speaking backgrounds.

Another Inquiry into regional industry adjustment by the Productivity Commission in 1993 (*Impediments to regional industry adjustment*) focused more on assessment of the role in adjustment of traditional factors of production, including labour, land, and capital as well as the role of government. The Commission's recommendations were based on influencing firm level location decisions using economic influences such as the availability of skilled labour; the cost of labour; the availability and cost of land; closeness to raw materials and markets; and infrastructure costs (particularly the cost of transport). The 1993 Inquiry gave less attention to issues such as innovation and R&D which are currently more prominent in approaches to regional development.

The main recommendation in the report prepared by 1993 Inquiry was that labour mobility and workplace flexibility were critical in improving the efficiency of regional labour markets and facilitating adjustment. It was assumed that regional adjustment capability depends on labour movement, and that the social security system caused some adverse outcomes on these labour movements. In particular, the social security system was seen as encouraging people receiving the (nationally uniform) unemployment benefit to migrate to higher unemployment regions due to lower costs of living. Also, it was claimed that more flexibility such as diluting national consistency in Awards and enabling greater differences in wages across regions would allow firms to maintain or enhance their competitiveness through flexible lower labour costs. Some government programs such as retraining initiatives and wage subsidy schemes were viewed as effective.

The 1993 Inquiry also called for changes to land and infrastructure regulations. In particular removal of overlapping regulations across different levels of government, land use restrictions and approval process which impeded industrial relocation.

While many of these impediments are still very much in evidence today, evolution in policy approaches to regional development and lessons learned from past Australian experience show that for regions vulnerable to transitional pressures, more place-based policies like improving skills, employment prospects and innovation have important roles to play in facilitating adjustment.

5.2. Non-economic factors

Regional change and adjustment are well studied subjects across a variety of different areas; sociology, economics, regional development, geography and history. Each perspective adds something to our understanding. Economic endowments are clearly important foundations of transitions, but other endowments are also becoming recognised as crucial in facilitating a transition process.

There are many factors that help a region adjust. The literature has identified some related to economic characteristics[xxxviii] such as industry structure, specialisation, competitive advantage, financial capital, markets, etc. A key to the assessment of these factors is that most studies look to the outputs of the adjustment, e.g. jobs, gross value added output or median incomes as measures of adjustment. As these are the outputs of the adjustment phase, a focus on these measures does not help identify what 'helps' adjustment, either economic or non-economic factors.

This section draws on previous research to document the many factors that have been identified that help regions adjust that are not of an economic nature or cannot be easily measured.

One of the most effective approaches looks across seven 'Community Capitals' to develop an holistic approach to facilitating transitions. The Community Capitals Framework[xxxix]

> *[helps reverse] the spiral of decline that has gripped many rural communities. Decline in financial capital may trigger the downward spiral. The loss of an industry or various firms in a particular region makes it more difficult to mobilize political capital, which stimulates additional losses in human and social capitals in a vicious cycle of despair. [The application of the Community Capitals Framework] approach sought to reverse this spiral through a series of public and private interventions we call "spiralling-up." [Application showed] the degree to which [the] integrated, collaborative strategy effectively and systematically increased all the community capitals in a mutually-reinforcing spiral of community development. Through this spiralling up process, we identify critical investments in social capital as the entry point for community change. (Emery and Flora 2006 p20).*

The Community Capitals Framework (Figure 9) encompasses seven interrelated capitals which capture the relationships between physical endowments and social endowments and provide a way of assessing a community's ability to adapt. The economic capitals have a place in the framework, alongside the intangible assets embedded in regions.

Figure 9 Community Capitals Framework

Source: RAI graphic, content from Flora and Flora 2008[xl]

Quantitative economic metrics tend to focus on Natural Capital, Built Capital, Financial Capital and the qualifications components of Human Capital. But Political, Cultural and Social Capital all play very significant roles in underpinning successful transitions. Evidence is mounting that targeted efforts on non-economic factors can have measurable impacts on regional economic transitions (see Box).

Box: Facilitating transitions – reversing decline in Valley County Nebraska

The Home Town Competitiveness program was designed to support transitioning Nebraska communities, and Valley County received modest funding ($100,000 over two years) to implement a Community Capitals Framework response.

The activities funded focused on the flight of young people, with a goal of retaining or encouraging the return of three high school graduates per year. Three strategies framed the program: leadership, entrepreneurship, and wealth transfer. Each of these strategies included a youth component. The local leadership team looked for opportunities to include young people; the local entrepreneurship team found ways to help young people gain experience as entrepreneurs and to see entrepreneurship as a viable choice for a career; and the local wealth transfer team recruited youth volunteers.

The entrepreneurship strategy focused on the inter-generational transfer of (mostly Main Street) small businesses, and on companies with the potential to "break-through" to a broader product line or a larger market and to grow new jobs rapidly.

The wealth transfer strategy targeted capturing 10% of community wealth transfer into a community foundation to support ongoing economic development.

All specified targets were met through the program, and after the program retail sales, personal income and new entrepreneur cash flow all increased more than state average growth rates.

The implication of this body of research is that due consideration needs to be given to understanding and working with the role of the non-economic factors in facilitating transitions. Though these non-economic factors are often seen as hard to assess and influence, there are some rigorous approaches that can be implemented. For example, nine region and community-level responses to economic challenges are articulated in Hogan et al[xli]. These build on earlier success factors research[xlii], and can be summarized as follows:

1. Recognise the uncertainty inherent in future;
2. Strengthen localized governance structures, based on existing social bonds and the notion of place and shared living experiences
3. Exploit any latent potential for economic 'growth from within' based on local specialisations and entrepreneurial drive;
4. Rebalance firm scale economic objectives – from profit maximization to livelihood provision;
5. Explore potential for consumption-based economies that recycle income within communities and support local jobs;
6. Enable economic benefits from broader population trends such as younger families moving from satellite small towns to regional centres;
7. Explore greater economic benefits from better internet connectivity to ensure that these technologies don't take as many jobs from regional communities as generate within them;
8. Pursue community driven brokerage models to solve local problems in provision of ongoing employment – such as short term skills gaps or seasonality;
9. Embrace opportunities from mobile workforces – people choosing to drive out, drive home.

These mirror some of the activities undertake in the Valley County example (Box) and provide a practical guide to influencing transitions at the regional and local scales. Useful Australian resources available to facilitate community-led responses to transitions include the *Manual for Small Town Renewal* and the *Community Adaptability Toolkit*:

- The *Manual for Small Town Renewal* (RIRDC publication 01-043) is a resource for fostering community change and renewal. It focuses on what communities are doing and can do, and provides practical resources (including case studies, frameworks, guides, checklists and research tools) to enhance the capacity of small rural communities to undertake proactive renewal initiatives.

- The *Community Adaptability Toolkit* (RIRDC publication 14-042) provides rural and regional communities with a methodology for identifying areas of strength in terms of their population (their human capital), their economy, and their capacity to work together to identify, develop and support a shared vision for change.

Conclusion

The implication of this research summary is that non-economic endowments are not only important considerations, but can also be valuable points of influence in supporting successful transitions. The attributes underlying the non-economic factors can be hard to measure, so it will be challenging to incorporate these measures into economic metrics of vulnerability and capability. Nevertheless, while measurement may be difficult, specification of roles and actions under these non-economic headings is possible, and some well documented pathways exist, along with some practical tools developed to improve regional capability.

Recommendation 9. That the study give due consideration to non-economic factors influencing capacity for successful transitions.

6. Recommendations

The RAI makes nine recommendations for the Commission to consider in undertaking the study into transitioning regions. We make these recommendations while mindful of the scope of the study, and the potential for the study's outcomes to influence the government's approach to transitioning regions. Government roles in these transitions is a contested space, but a clear role for government has been well summarized in Everingham and Franks[xliii] (2015):

> *Resources booms, drought, deregulation of agricultural trade, and extensive NRM reforms have precipitated sometimes painful structural adjustments for rural Australians. History and our federal system show that there is some opportunity for direct legislative intervention by the Federal Government, but considerably more opportunity to contain the most negative consequences of such occurrences and minimise ill-effects through working in collaboration with the private sector, other levels of government and local and regional stakeholders. In both direct and indirect ways, there is an opportunity to provide coordination and leadership and set a course that will deliver a legacy of sustainable regional development from extraction of the nation's endowment of mineral and energy resources. Improving flawed processes like joint strategic regional assessments, coordination through COAG, and currently fragmented approaches to regional planning and development that neglect cumulative impacts will be fundamental. So will coordinating, resourcing, empowering and building the capacity of existing institutions with the potential to plan, monitor and manage balanced development in regions seeking to leverage benefits from extraction of minerals, oil and gas. (p 294)*

RAI Recommendations

1. That this study be used to compile a better data set to identify boom-bust cycles in regions, and that this be publicly available.
2. That comment be invited on the economic metrics developed.
3. That this study clearly articulates how a successful transition can be identified.
4. That this study clearly articulates the scenarios which will underpin the assessment of regions' ability to transition successfully.
5. That due consideration be given to regions where a high proportion of residents are employed in mining, but which are far from mine site locations.
6. That mining industry labour mobility be assessed in the context of broader (internal) migration trends in Australia.
7. That due consideration be given to non-work factors driving labour mobility.
8. That the study includes analysis of best practices in managing services and economies in communities that are losing population.
9. That the study give due consideration to non-economic factors influencing capacity for successful transitions.

Endnotes

[i] Hogan A, Wilson B, Baker D, Burton L, Buyys L and Cuthill M 2015, Reclaiming livelihoods: Initial steps to re-institute a viable socio-economic base for living in country settings, *Rural and Regional Futures* (A Hogan and M Young Eds) Routledge; McLean I W 2012, *Why Australia Prospered: The Shifting Sources of Economic Growth*, Princeton; Argy, F 1998, *Australia at the Crossroads*, Allen and Unwin, Sydney; Carson, D 2011, Mapping the 'patchwork economy' in rural and remote Australia: how employment in industry sectors plays out across regions, *Discussion Paper HC Coombs Policy Forum* ANU

[ii] See for example *Regional Development and Population in Western Australia*, RAI 2015

[iii] Houghton K and Fell T , 2011, Characteristics of economic sustainability in regional Australia, *Discussion Paper HC Coombs Policy Forum ANU*

[iv] Duncan, A., Gao, G., Nguyen, H., Ong, R., & Tarverdi , Y. 2016, October Back to the future: Western Australia's economic future after the boom, *Focus on Western Australia* Series (Issue #8), p. xii

[v] Queensland Resources Council, 2015, *Submission to the Queensland Parliamentary Committee of Inquiry into fly-in, fly-out and other long distance commuting work practices in regional Queensland*, Brisbane, Queensland Resources Council

[vi] Productivity Commission 2014, *Geographic Labour Mobility*, Research Report, Canberra

[vii] McKenzie, F. H. 2011, Inquiry into Fly-in/fly-out and Drive-in/Drive-out Workforce Practices in Regional Australia, *Submission to the House of Representatives Standing Committee on Regional Australia*, October 2011, and House Standing Committee on Regional Australia 2013, *Cancer of the bush or salvation for our cities? Fly-in, fly-out and drive-in, drive-out workforce practices in Regional Australia*, retrieved from http://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=ra/fifodido/report.htm

[viii] Excess labour demand means that the number of jobs in a region is higher than the number of workers living in the region. Excess labour supply is that the number of workers in a region is higher than the number of jobs.

[ix] Queensland Resources Council op cit

[x] Queensland Resources Council op cit

[xi] RAI website blog *Housing booms and mining towns: The influence of mining and construction on connected cities,* February 2017

[xii] The location quotient for mining employment for people who usually live in Auburn, for example, but who could be working anywhere in Australia, is calculated as the following way:

$$LQ^{UR}_{\text{Auburn}} = \frac{Share\ of\ mining\ employment\ living\ in\ Auburn}{Share\ of\ mining\ employment\ in\ Australia}.$$

The LQ is simply the ratio of the share of mining employment of those living in Auburn, compared to share of mining employment across Australia.

[xiii] Houghton K and Fell T 2015, Assessing adaptability in regional economies, *Rural and Regional Futures* (A Hogan and M Young Eds) Routledge

[xiv] Regional Australia Institute 2013a, *The Costs and Benefits of Geographic Labour Mobility: A Regional Perspective*, Submission to Productivity Commission Inquiry into Geographic Labour Mobility, Canberra

[xv] Government of Western Australia 2013, *Living in the Regions: A survey of attitudes and perceptions about living in regional Western Australia,* Department of Regional Development, Perth. Retrieved January 19, 2017, from http://www.drd.wa.gov.au/Publications/Documents/Living_in_the_regions_2013_State_Report.pdf, p. 63

[xvi] RAI 2013a op cit

[xvii] RAI 2013a op cit

[xviii] RAI 2013a op cit

[xix] National Occupational Licensing Authority 2014, *Submission to the Productivity Commission in relation to Geographic Labour Mobility,* National Occupational Licensing Authority

[xx] RAI 2013a op cit

[xxi] RAI 2013a op cit

[xxii] Australian Bureau of Statistics 2014a *Population growth and population turnover rates - Local Government Areas, 2006 to 2011*. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/1376.0Main%20Features3602013?opendocument&tabname=Summary&prodno=1376.0&issue=2013&num=&view=

[xxiii] RAI 2013b, *Talking point: Returning to regional Australia*, Canberra

[xxiv] RAI 2013b op cit

[xxv] Australian Bureau of Statistics 2014b 6209.0 - Labour Mobility, Australia. Retrieved January 20, 2017, from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6209.0February%202013?OpenDocument

[xxvi] See for example the Shrinking Cities International Research Network at http://www.shrinkingcities.info/site/
[xxvii] OECD 2009, *How Regions Grow: Trends and Analysis*. Paris, OECD Publishing
[xxviii] *The Economist* Dec 2016 "Place-based economic policies as a response to populism", retrieved from http://www.economist.com/news/finance-and-economics/21711882-orthodox-economics-distressingly-unhelpful-solving-problem-regional
[xxix] *The Economist* op cit
[xxx] *The Economist* op cit
[xxxi] OECD 2009 op cit
[xxxii] *The Economist* op cit
[xxxiii] Daley J and Lancy A 2011, *Investing in Regions: Making a Difference* Grattan Institute, Melbourne
[xxxiv] OECD 2009 op cit
[xxxv] RAI 2016, *[In]Sight – Innovation: Spreading the Ideas Boom* retrieved from *http://www.regionalaustralia.org.au/home/wp-content/uploads/2016/06/Innovation-In-Regional-Australia-Spreading-the-Ideas-Boom-1.pdf*
[xxxvi] OECD 2009 op cit
[xxxvii] Productivity Commission 1998, *Aspects of Structural Change in Australia* Canberra
[xxxviii] For an overview see Dinh, H. and Pearson, L., 2015. Specifying community economic resilience-a framework for measurement. *Australasian Journal of Regional Studies*, *21*(3), p.278.
[xxxix] Emery M and Flora C 2006, Spiraling-Up: Mapping Community Transformation with Community Capitals Framework: *Journal of the Community Development Society*, Vol. 37, No. 1, Spring
[xl] Flora, C. B., & Flora, J. L. 2008, *Rural Communities, Legacy and Change*, Boulder, CO, USA, Westview Press
[xli] Hogan et al 2015, op cit
[xlii] For example *The success factors: managing change in regional and rural Australia*, report commissioned by Regional Women's Advisory Council / Dept. of Transport and Regional Services 2001
[xliii] Everingham J-A and Franks DM 2015, Development of mining-affected regions: The influence of the Commonwealth in a state-dominated sphere, *Rural and Regional Futures* (A Hogan and M Young Eds) Routledge