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An examination of house price movements in Queensland resource communities

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ABSTRACT

Successive mining "booms" have created wide-ranging, long-term socioeconomic impacts in many parts of Australia. Property markets were both directly and indirectly affected by the mining booms. Towns associated with mining activities experienced significant, rapid shifts in supply and demand levels for housing as well as changes to the amount and type of development occurring. The most recent "mining boom" in Queensland impacted on housing market dynamics, with impacts evident at all stages of the resource cycle. Housing markets were also indirectly affected by new actors and new drivers for buying property in these markets – as an investment.

This paper aims to show that the "mining boom" was only one stage of a more complete cycle, and the impacts of this resource cycle on housing were particularly nuanced. Even in the short term, the importance of housing market stability-particularly measured through availability and affordability is important to the wellbeing of a town, and the underlying community. During the most recent cycle, housing markets in Queensland mining towns were uniquely affected.

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Regional housing; resource dependence; socioeconomic wellbeing; modelling of markets

1. Introduction

The social and economic landscape of the mining industry and mining communities has changed substantially over the last four decades (Rolfe, Miles, Lockie, & Ivanova, 2007). It is argued the most recent mining "boom" has accelerated the trends away from the traditional patterns of a mining town (Ivanova, Rolfe, Lockie, & Timmer, 2007; Lockie, Franettovich, Petkova-Timmer, Rolfe, & Ivanova, 2009). This new pattern has been accentuated by prolonged levels of high demand for both iron ore and coal mined in Australia and has been further exacerbated by the social changes many mining towns are experiencing. There remain significant gaps in the collective knowledge around the most recent mining cycle in Australia. The housing market in these mining towns has been identified as being important to the general wellbeing of the local population, but it is largely under-researched with almost no forward-looking, long-term analysis. Because of these identified gaps, this paper aims to examine whether similar market-specific factors have impacted Queensland during the mining boom.

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Australian research has, up until this point, largely focused on the changes involved in cycles in a broad sense with academic coverage clustered in the early stages of the cycle through to its peak (Rolfe et al., 2007; Langton & Mazel, 2008; Lockie et al., 2009; Connolly & Orsmond, 2011). With respect to housing, much of this research has identified price and demand changes, but has not necessarily contextualized this with larger scale, more general town and community changes occurring in the wake of the unprecedented mining cycle. The rich international academic body of knowledge on resource towns shows that housing plays a far more important role in community wellbeing than has been recognized in the context of the recent Australian resource cycle (Hayter, 2000). Further, it is apparent that little analysis of resource or mining towns in Australia had looked forward in an effort to forecast or plan for change even in the wake of record housing (and resource) market volatility.

Towns were impacted by socioeconomic change, and the mining companies changing operational praxis and their approaches to housing also influenced them. The unique housing market participant groups changed supply-demand dynamics and towns and communities were permanently altered. As shifts occurred in the type of housing that was developed and what was demanded and by whom structural change within towns and communities was evident. Thus, housing market dynamics were influenced by changes occurring within the mining sector over time, but also, that shifts in housing had knock-on effects which then impacted local economy, population movement, socioeconomic wellbeing and the recovery of towns in the post-boom phase.

The property market, specifically the housing markets of towns that are reliant on mining resources in Australia, is lightly researched with very little long-term or econometric analysis, meaning forecasting and planning capacity is negligible. This paper investigates these issues in selected Queensland mining towns. Medium and long-term outcomes in mining towns are found to be generally negative, and housing markets found to be underperforming for considerable periods following the peak of the mining cycle. Further, longitudinal research is required to reduce post-boom housing volatility. The paper suggests that better management of housing markets throughout a cycle, particularly in light of changing operational approaches by mining companies, could result in better socioeconomic outcomes for communities generally.

This paper looks at the impact of resource cycles, driven by coal extraction, on mining towns in Queensland's Bowen Basin to examine the leading variables that help to direct the housing market during a boom and bust period that is, across the cycle. From this, we look to highlight long-term impacts on these towns.

2. Literature review

Mining has been a major industry in Queensland for more than a century with famous mining towns such as Mount Isa and Longreach home to a variety of rich resource deposits (Blainey, 1993). There are numerous, significant mining towns in the state; Charters Towers to the north of the Bowen Basin played a significant role in the mining history of Queensland and Australia more generally (Bell, 1998). Recently, Queensland has experienced a resurgence in the mining and mineral sector, particularly driven by energy demands – major gas, oil and coal projects have developed or grown since the turn of the century (DNRM, 2016) with more development mooted (Horn, 2016). Coal mining has

re-emerged as a significant industry and part of the state's economy with employment growing significantly throughout the most recent resource cycle (QGSO 2016). The focus area of this research, the Bowen Basin, has a rich history of mining and resource extraction, particularly for energy production purposes (Elliot 1989; Kesteven, 2015).

The gold rush of the 1850s set Australia's trajectory as a resource-dependent nation, and a series of subsequent booms occurred (Blainey, 1993). The boom that followed the extended gold rush was the mineral boom of the late nineteenth century (Battelino 2010) and was built not only on gold, but also other precious metals and driven by the population expansion in remote areas that were characteristic of the 1850s gold rush (Battleino, 2010).

The third major boom in Australia's history occurred in the late 1960s. This was a boom in coal and iron ore and occurred at a time of increasing energy costs in Australia (ABARE 2004). While coal had been the staple mineral resource, produced at a relatively constant level since before the 1850s gold boom, the 1960s saw coal production increase significantly (ABS 2001)

However, any slump after this third boom was short-lived, and by the mid-to-late 1970s mineral resources were once gained in demand. The 1970s boom for coal and gas resources was widespread, but perhaps had its most significant impacts in central Queensland, particularly with respect to coal-related development (Gurrib, 2011). Australia's most recent boom began in the early 2000s amid high levels of demand from China (Phillips, 2016). Research and media coverage has the boom commencing as early as 2003 (Phillips, 2016) and as late as 2005 (Battleino, 2010). Demand was strong for iron ore (to facilitate construction projects), and for coal to fuel power stations (thermal coal) and to smelt iron ore into steel (coking coal). There was growing demand for all three commodities, strong levels of growth Asian economies were experiencing during this time meant that growth and expansion occurred rapidly.

The mining cycle that affected Western Australia and Queensland from 2004–2012 had significant structural differences compared to those that preceded it. Of course, all Australia's mining booms have been materially and structurally different as they incorporated new technologies, sought different metals or minerals, occurred in different geographic locations, and lasted for varying durations. Western Australia's boom relied on iron ore extraction, and Queensland's mining boom focused on coal and followed the growth in the sector in Western Australia.

The most recent boom in Queensland, however, was dramatically different, with a suite of significant changes that all developed in a short period of time, including:

- 24-hour mine operation with matching rosters
- Fly-in and Fly-out (FIFO) and drive-in and drive-out (DIDO) commuting
- Increased diversity in the source locations of employees
- Development of mining camps
- Automation of numerous roles
- Distinct changes in policy and practice of mining companies
- Unprecedented growth in value and unprecedented duration

(Haslam McKenzie, Martin, Paris, & Reynolds, 2007; Rolfe et al., 2007; Tonts et al. 2012, and Lawrie et al., 2011)

Linkages between housing and mining in Australia are under-researched, particularly in the context of the most recent resource cycle, where much of the recent literature viewed housing as a component of a broader socioeconomic analysis into mining towns. In reviewing the body of knowledge, Haslam McKenzie and Rowley state, "Lawrie, Tonts, and Plummer (2011) provide a useful review of the literature on the interaction between resource dependence and socioeconomic wellbeing in Australia and other countries in the developed world. The authors argued the socioeconomic trajectories of boomtowns are highly nuanced, but not always negative, a finding supported by Petkova, Lockie, Rolfe, and Ivanova (2009)" (Haslam Mckenzie & Rowley, 2013, p. 374).

Regional areas reliant solely on mining have been found to be far more volatile and vulnerable (Haslam Mckenzie & Rowley, 2013). Hence, housing markets in regional areas where mining is prominent have demonstrated performance that goes against long-term regional housing market performance trends, but this has been accompanied by a series of social and economic issues (Petkova et al., 2009). There is hitherto a critical shortage of analysis of interactions between socioeconomic issues and housing.

It is evident Australia benefited economically and regionally from the mining boom period (Tulip, 2014), towns where housing markets have been performing most strongly are the hubs of mining-driven growth or in the most richly endowed regions (Franks, Brereton, & Moran, 2013). Employment grew, wages increased and town populations in or near mining regions ballooned, leading to a myriad of short-term, positive impacts (ABARE, 2010). Of these regional areas, those with alternative industry bases or strong agricultural sectors have been showing signs of stronger performance across all phases of the resource cycles. This is particularly so as the post-boom phase develops, and regional housing markets face challenges (Queensland Government Statisticians Office, QGSO, 2016).

Changes in housing market dynamics have occurred in the most recent resource cycle (Rolfe et al., 2007). These occurred early, and quickly, they were driven by a range of factors making impacts and outcomes more difficult to track or address. Housing markets regionally, and in the three resource-reliant towns that this article examines, were shown to have changed dramatically (Petkova et al., 2009). Critically, the demand and supply pressures on housing changed, both of which were influenced by new and unique factors (Carrington & Pereira, 2011). Because of this, housing values, price and affordability changed regionally (Akbar, Rolfe, Greer, & Ivanova, 2011). The interaction of influencing factors in the relationship between supply, demand and value requires further examination-particularly over the entirety of the cycle. What was clear is that broader social and economic changes, driven by mining sector growth, occurred rapidly, and affected housing market behaviours, creating increased volatility. This led to a situation in which housing was influencing further socioeconomic change and-disruption (DILGP, 2016).

Research from both Australian and international sources has emphasised the significance of the role housing plays in any broader socioeconomic analysis, and moreover, the socioeconomic wellbeing of the town and community. Specifically, supply and affordability of suitable accommodation have linkages to socioeconomic wellbeing. To this end, an increased understanding of the mining industry will better equip researchers and governments at all levels to deal with pronounced resource cycles like the most recent boom in Queensland, Australia. Research from a range of sources has identified

fluctuations in demand for, and value of, minerals as impacting on housing in communities where there is a level of resource reliance (Haslam McKenzie, Brereton, Birdsall-Jones, Phillips, & Rowley, 2008) and the relationships from these interactions over the long term require further research. This paper aims to examine the interaction between the mining sector and mining-reliant towns.

The importance of and ability to predict or forecast house price movements have been a continuing theme in research circles (Gallimore et al. 1996, Ibeas, Cordera, Dell'olio, Coppola, & Dominguez, 2012). Gallimore et al. (1996) modelled the relationship between location and value, Ibeas et al. (2012) examined interactions between transport and property. The importance of different factors affecting different markets – even within the same country – has been analysed for some time in the commercial research sector (see for example D'Arcy, McGough, & Tsolacos, 1997).

This paper expands the research into housing markets of resource-reliant mining towns. By modelling the behaviour and fluctuations over time of these unique housing markets this paper both sheds light on an under-researched property sector, but also introduces modelling approaches typically utilised in commercial markets and adjusts these to make them applicable for regional residential housing markets that are further differentiated by the unique economies in which they operate and by their respective exposure to the mining resource cycle.

3. Market data

While much research attention over the last decade has focused on iron ore extraction and increases in price and production driving the resource boom, there has also been a considerable uplift both in spot price and exported tonnage of coal. The peak market price of 305 USD per metric ton (2008–09) (DNRM, 2016) for coking coal was significant. Going back only 5 years to 2003–04 the market price was 59 USD per tonne, an increase in value of 416% in only 5 years, clearly representing a "boom" in the sector. The vast majority of Australia's coal is produced in Queensland's Bowen Basin, the focus of this research.

The peak of the boom and the key impacts affecting the respective communities have been acknowledged both with respect to social issues generally, and housing issues specifically. Much of the focus has been directed at the extreme accommodation measures that many miners were resorting to; for example, camping or sleeping in their vehicles due to shortages of suitable rental accommodation (Petkova et al., 2009). Also highlighted were increases in both rent and purchase costs in mining communities; it was not uncommon around the peak of the boom for houses in central Queensland's mining towns to be renting for 1,800 USD a week (Hele, 2011), a figure that, at the time was considerably higher than the state capital of Brisbane (QGSO, 2016).

This research has undertaken a focused examination of three case study towns with differing exposure to the mining sector, all located within the broader Bowen Basin region in central Queensland (see Figure 1). Coking coal (used for steel making) is the more prevalent coal type mined in and exported from the Bowen Basin region, but it is more predominant in the Northern region. In Central and Southern regions, the number of thermal coal mining operations increases (DNRM, 2016).

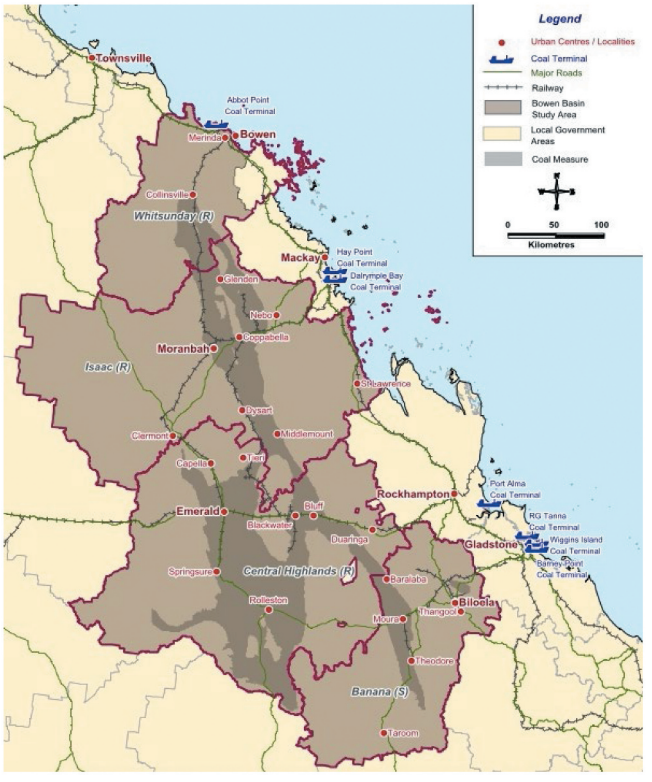

Figure 1. Bowen Basin region.

This is an important distinction as the trajectory of pricing in coking coal has been very different from that of cheaper thermal coal which is used for electricity generation as shown in Figure 2. Much of the coking coal mined is exported, while thermal coal is often used in Australia (and in the Basin itself) for power generation. Hence, metrics related to coking coal are viewed as more representative of this resource sector. This means that areas dominated by this production (such as the North of the Bowen Basin) will be more influenced by international demand. This specific characteristic of the geology of the Bowen Basin will be taken into account when considering the impact of the mining industry in the area.

Other information to be considered as possibly significant include the volume of coal mined per region and, given the international nature of the market, export volumes and values (Figures 3 and 4). Figure 4 illustrates a very different cycle for the relevant economies compared to Figure 3. Value of coal swung much more noticeably than the output of coal which generally remained on a stable and usually upward trajectory.

We compare these to the house prices in the three areas of Bowden Basin, represented by the towns of Moranbah (North), Emerald (Central) and Biloela (South) – see Figure 5.

Figure 5 shows there has been great volatility in these markets with rises of 100s of percent followed by steep declines. This has, naturally, been unsettling for the towns and their population as they live through it. The aim is to see whether there are any specific nuances and independent drivers to these markets, based on their specific

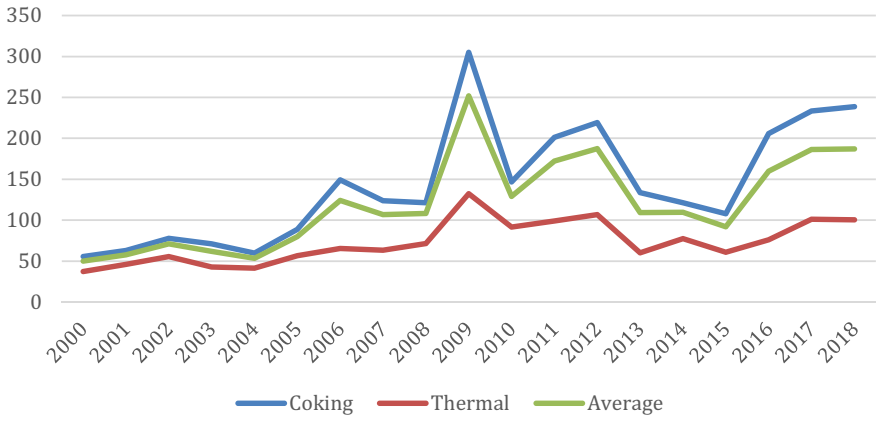

Figure 2. Export Prices per Tonne ($).

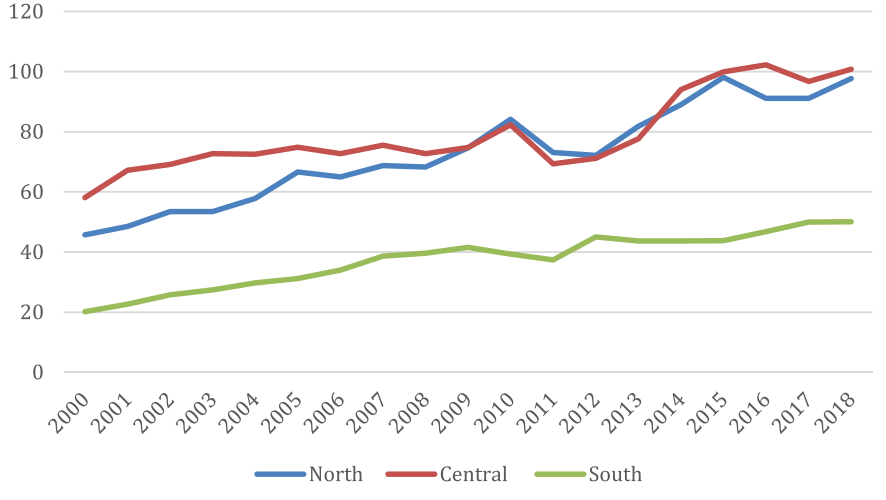

Figure 3. Coal Output per Region (m tonnes).

exposure to types of mining, which could be used to help predict future magnitudes of impact of economic cycles on different regions of Queensland, or whether all towns are driven by the overall wellbeing of the Queensland economy.

The data used are highlighted in Table 1.

4. Methodology and results

Data for regional towns are very limited, particularly on an annual basis in a consistent form for time series analysis. However, a housing database was created for house prices. The house price series was created by averaging all house sales completed in the year for each town. Only house sales of 3000 m^2 or less were included to avoid farms, etc., and only normal sales were included. Other data such as rental numbers were not available.

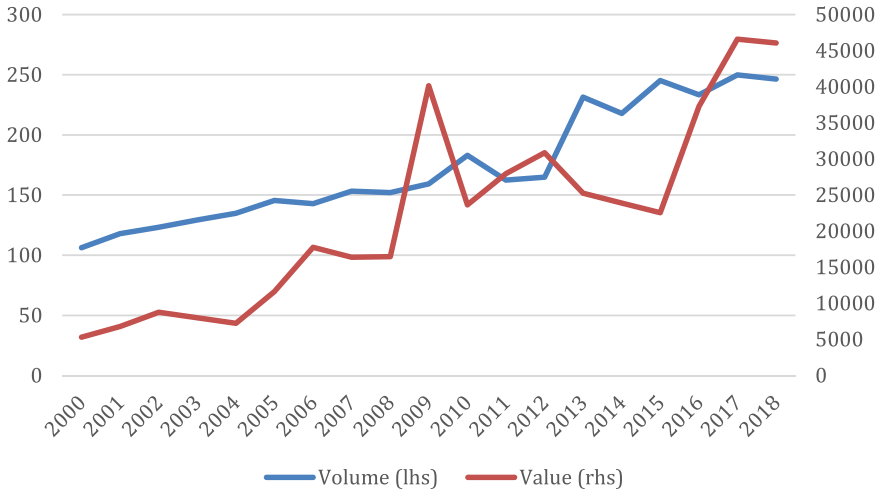

Figure 4. Coal Export Volume (m tonnes) and Value ($) for Queensland.

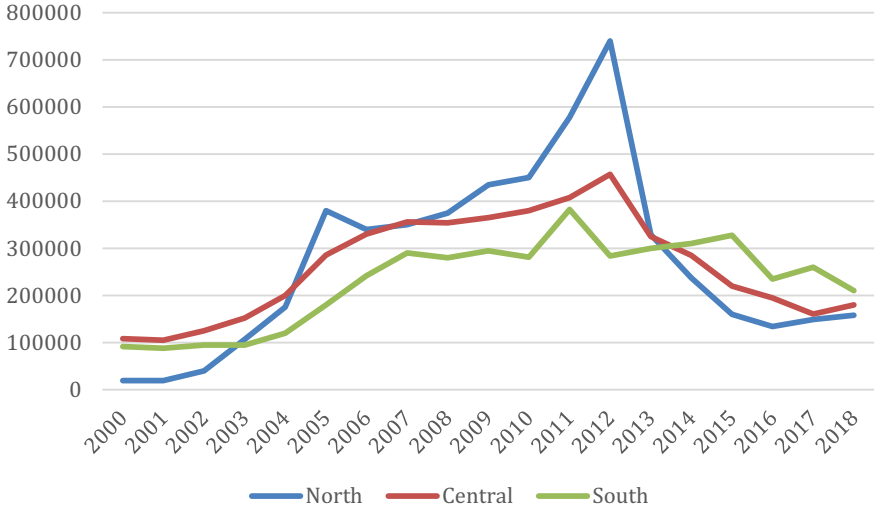

Figure 5. Average House Prices throughout the Bowen Basin.

This data was to be modelled against the figures obtained about the mining industry as highlighted previously in Table 1. Although this research was specifically looking at mining towns and analysing the mining effect, we wished to consider if they were the significant driver for housing in the area. Once again town level economic data were not available but a good proxy for the general economy being a driver was Queensland GDP – hence its inclusion. All data were then logged (Ln) to remove scaling issues.

We tested the main explanatory variables for stationarity, and there were mixed results as shown in Table 2. Whilst the Northern region passed the Augmented Dickey–Fuller (ADF) Test, the Central sector only passes at the 10% confidence level and the Southern

Table 1. Data Sources.

Variable	Source
House Prices	
Moranbah, Emerald, Biloela,	Queensland Valuer General
Coal Data	
Export Prices, Value and Volume for Queensland	Department of Natural Resources, Mines and Energy (DNRME, 2019)
Coal Output per region and sub-region	DNRME, 2019
Grade Value	DNRME, 2019
Queensland GDP (2015 prices)	Oxford Economics
All data annual 2000–2018	

Table 2. Results of an Augmented Dickey–Fuller test.

		Augmented Dickey-Fuller Result	
Variable	Mnemonic	Level	Difference
House Prices			
North	NHP	−3.56	N/A
Central[a]	CHP	−2.96	−2.05
South	SHP	−1.74	−3.63

[a]Passes at 10% confidence level, but not 5%.

sector fails. However, an ADF test for the difference of prices in the Central region showed evidence of over differentiation (the ADF figure got worse). Consequently, the analysis proceeded in levels with caution and allowed a trend variable to be included.

This implies that the analysis would move from the function:

$HP_t = f(D_t)$ to either $LHP_t = f(LD_t)$ or $LHP_t = f(LD_t, TREND)$

Where:

HP = Average house price

D = An indicator of demand-side impact from the variables listed in Table 1.

TREND is a possible log trend.

Obviously, it would be even better to have supply-side variables, but that data were not present at the level of this analysis. Given that supply in property moves much slower and is lumpier than changes in demand, this model should still pick up the demand side determinants.

Given the limited availability of annual data, it was not possible to consider using cointegration techniques and the like. The model was then run using a general to specific technic, including all variables and a 1 period lag and removing those least significant. The average coal price was only included if both coal types had been excluded. This was to remove the likelihood of multicollinearity, as the average is clearly related to the two prices. Similarly, the volume of coal exported was only added when the value had been removed.

The results for the three towns are shown in Table 3.

Initial modelling was unsatisfactory. While the basic equations made basic economic sense, the very low Durbin–Watson statistics implied problems with serial correlation. The use of a trend variable did not remove this. When modelled in differences instead, there were no significant variables whatsoever which seemed very unusual. The obvious issue was the possibility of a structural break.

Table 3. Initial modelling results.

			Durbin Watson	R Bar Squared
North	−32.77	2.48NCO[a]	0.3	0.27
t-statistic	−2.00	2.74		
Central	−4.91	0.74a VALUE	1.3	0.76
t-statistic	−0.74	5.98		
Southern	−13.25	1.58SCO[a]	0.8	0.71
t-statistic	−3.70	6.68		

[a]Where CO is coal output in the North or South region.

A critical consideration when reviewing data contained and exploring relationships between housing and mining is the development of mining camp accommodation to house employees (Rolfe et al., 2007). This phenomenon was new to the Bowen Basin and occurred during this resource cycle as a result of severe rental price increases occurring, particularly during the period from 2007–2011 (McIntosh, 2012), throughout this period, all mining companies operating in the region increased their use of purpose-built, private mining employee accommodation (Carrington & Pereira, 2011).

The direct result of this was an almost immediate cessation in mining companies paying or subsidising extremely high private rental prices asked, thereby creating an almost immediate change in income for property investors and an equally rapid change in value of property (Petkova et al., 2009). Specific data on the pace or scale of the increase in use of mining camps are not forthcoming, and not freely published by mining companies. The use of mining camps generally ran in parallel with the increasing use of non-resident FIFO and DIDO workers (McKenzie, 2010).

This would obviously impact the relationship between coal and house prices in the region in the second half of the period. Reviewing the error terms from the Northern area

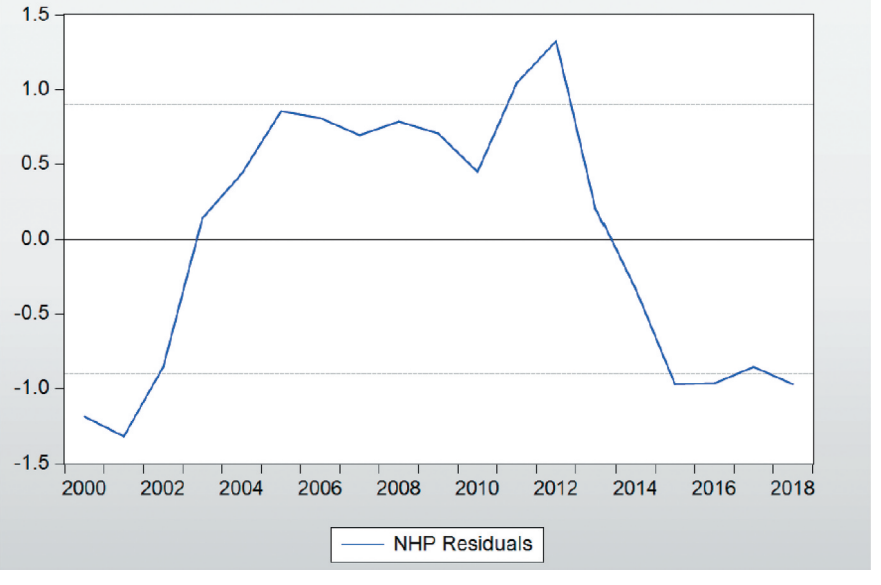

Figure 6. Error terms from initial model for Northern house prices.

model (Figure 6), for example, shows a clear structural break towards the end of the period.

The other sectors showed similar patterns and are available from the author.

The data were remodelled, however, this time allowing for breaks to occur around the very beginning of the boom and around the period 2010–14. Dummy variables were also included to see if certain events by the mining companies may have had deeper impact around that period of major change in the relationship between the mining companies and the local economies. The sample was ended at 2014 (at the latest) as this is the point when the mining camps are fully operational and thus it is possible that the relationship had broken down between mining and the towns housing market as shown in the residuals.

5. Analysis of results

The results highlight some important facts. There is a clear and statistically sound relationship between certain coal variables and the mining towns in the period up to the boom and shortly afterwards. Compared to Table 3, the explanatory variables in Table 4 are more significant and the equations have a greater explanatory power. At the same time, the Durbin Watson statistics are showing a more acceptable equation in terms of the structure of the error terms and thus the equation overall.

In several regions, there are clear negative impacts, which coincide with the timing of the mining companies starting to change their policy on housing and use of miners. This was indicated by the significance and negative coefficients of the dummy variables. The Northern and Central regions were where the towns were most dependent on the cyclical mining boom and consequently most negatively impacted by the mining camps as a larger proportion of the miners had arrived in the town during the boom. The Southern town had a more diverse economy, with a mining sector linked to a local power station. Consequently, the results showing little impact on the southern model are understandable. For further details of the characteristics of mining towns in the Bowen Basin see, for example, Rolfe et al. (2008).

Modelling of mining data separately past this period provides little correlation with any of the towns' house prices. This explains the poor Durbin–Watson statistics and the weaker explanatory power, particularly of the Northern region. This implies that shortly after the introduction of the mining camps, the relationship between the boom in the mining sector and house price growth falls away.

Table 4. Final results and sample dates.

						Durbin Watson	R Bar Squared	Data Sample
North	−120.75	+	7.41aNCO	+	−1.38 D10[a]	1.6	0.91	2000–12
t-statistic	−10.17		11.18		−10.17			
Central	−9.09	+	0.76a AVER	+	−0.50D9[a]	1.7	0.8	2003–14
t-statistic	−16.81		6.59		−2.76			
Southern	−27.93	+	2.31aSCO	+		1.8	0.81	2002–14
t-statistic	−4.98		7.17					

[a]Where D9 is a dummy for 2009 and D10 a dummy for D10.

For a short period of time the mining towns in Queensland shared in the fortunes of the mining industry. However, as the boom came to its peak mining companies changed their housing policies altering their reliance on, and interaction with towns and communities. This meant that following the end of the boom, housing prices fell back even more sharply than coal prices. House prices have not shared in the resurgence of the mining industry in more recent years. While the mining industry has performed well again in recent times, this has simply not fed back through into the towns which previously prospered, and the relationship between the two has been permanently altered.

The dislocation of the companies' fortunes and requirements during the boom are clearly illustrated by the huge error terms on the models post the late 2000's cycle compared to the present (Figure 6). This leaves many homeowners and investors in a parlous state given the likelihood of a large recovery in house prices on the back of coal is now much more unlikely. Many people will be left in negative equity or with loss-making investments in housing, regardless of the performance of mining in the region.

6. Conclusions

In summary, this paper found that there was a clear relationship between the prosperity of the mining industry and the prosperity (at least in terms of increased house prices) initially during the mining boom. This increase in property and land value would compensate the towns and indirectly the councils for the intensive use of their town.

With the move towards the use of mining camps this compensation disappeared and, particularly in the towns most linked to the mining industry, was reversed. Besides meaning the benefits were no longer shared this would leave late purchases and investors in negative equity and councils would lose a source of extra income for infrastructure requirements.

In the present environment, if this structure of working continues for the mining companies one can only conclude that there will be limited directing of benefits to individuals or the towns themselves from industry booms in the future whilst the impact on infrastructure and social wellbeing would remain and need funding. Consequently, there needs to be considered a more direct way of sharing the benefits of these booms to cover not just the companies but also the societies they work within.

This article adds to a growing body of research focused around the positive and negative impacts of mining on communities and explores in further detail the relationships that exist between fluctuations in the value of the resource on which a community is reliant and the housing market in that community. It is posited that such research is utilised by governments to work more closely with all stakeholders in developing and managing future resource projects.

While future "booms" may not have the same levels of development or the longevity of the most recent boom, there still exists the potential for significant, negative socio-economic outcomes unless multiparty initiatives are developed and put in place. Further analysis on the impact of these booms in the long term on societies needs to be made and a consideration of a more direct form of funding the services needed to support them, particularly if the present business model from mining companies is continued.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

ABARE. (2010). *Australian commodity statistics 2010*. Canberra: Author.
ABARE energy report (2004), Australian Bureau of Agricultural and Resource Economics (ABARE), Canberra, <http://www.agriculture.gov.au/SiteCollectionDocuments/about/annual report/previous-reports/annual-report-2004-05.pdf>
Akbar, D., Rolfe, J., Greer, L., & Ivanova, G. (2011). Housing demand forecasting for the Bowen Basin towns: Lessons for developing countries. *Bangladesh Journal of Regional Science*, *1*, 19–29.
Australian Bureau of Statistics (ABS) (2001), *Annual Report*. Canberra
Battleino, R., (2010). Mining booms and the Australian Economy, Address to the Sydney Institute, https://www.rba.gov.au/publications/bulletin/2010/mar/pdf/bu-0310-10.pdf>
Bell, P. (1998). The fabric and structure of Australian mining settlements, Ch. 1. In Herbert, E.W., Knapp, A.B. & Pigott, V.C. (Eds.), *Social Approaches to an Industrial Past: The Archaeology and Anthropology of Mining*, 25–38. Taylor and Francis.
Blainey, G. (1993). *The rush that never ended: A History of Australian Mining*. Carlton: Victoria: Melbourne University Press.
Carrington, K., & Pereira, M. (2011). Assessing the social impacts of the resources boom on rural communities. *Rural Society*, *21*(1), 2–20.
Connolly, E., & Orsmond, D., (2011). *The mining industry: from bust to boom*. Economic Analysis Department, Reserve Bank of Australia.
D'Arcy, E., McGough, T., & Tsolacos, S. (1997). National economic trends, market size and city growth effects on European office rents. *Journal of Property Research*, *14*(4), 297–308.
DILGP. (2016). *Department of Infrastructure, local government and planning, RPI act guideline 03/14*. Brisbane: Queensland Government.
DNRM 2016, Annual Report 2015–2016, Department of Natural Resources and Mines (Qld). <https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0019/540055/dnrm-annual-report-2015-16.pdf>
DNRM (2019), Annual report 2018–2019, Department of Natural Resources and Mines (Qld), <https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0011/1457066/annual-report-2018-19.pdf>
Elliott, L. (1989). The surat and Bowen Basins. *The APPEA Journal*, *29*(1), 398–416.
Franks, D. M., Brereton, D., & Moran, C. J. (2013). The cumulative dimensions of impact in resource regions. *Resources Policy*, *38*(4), 640–647.
Gallimore, P., Fletcher, M. and Carter, M., 1996. Modelling the influence of location on value. *Journal of Property Valuation and Investment*,*14*(1), .6–19.
Gurrib, I., (2011). Does the money endogeneity theory of post-keynesian economics apply in frontier emerging markets? The Case of Saudi Arabia. *International Journal of Finance and Management, 1*(1), 21–31
Haslam Mckenzie, F. M., & Rowley, S. (2013). Housing market failure in a booming economy. *Housing Studies*, *28*(3), 373–388.
Hayter, R. (2000). Single industry resource towns. In E. Sheppard & T. J. Barnes (Eds.), *A Companion to Economic Geography*, 290–307. Oxford: Blackwell.
Hele, M., (2011), 'Chinese lead increase in foreign investment in Queensland residential property in 2011', *The Courier Mail*, December 30, https://www.couriermail.com.au/lifestyle/foreigners-

buy-up-big-in-property/news-story/eec65d87a718c0f42a765b9071692cba?sv=8c1b2b8174c1c809acb8fd1a0e46f925>

Horn, A., (2016), 'What we know about adani and the carmichael mine project', *ABC News*, <https://www.abc.net.au/news/2016-12-05/what-we-know-about-adani-and-the-carmichael-mine-project/8094244>

Ibeas, Á., Cordera, R., Dell'olio, L., Coppola, P., & Dominguez, A. (2012). Modelling transport and real-estate values interactions in urban systems. *Journal of Transport Geography*, *24*, 370–382.

Ivanova, G., Rolfe, J., Lockie, S., & Timmer, V. (2007). Assessing social and economic impacts associated with changes in the coal mining industry in the Bowen Basin, Queensland, Australia. *Management of Environmental Quality: An International Journal*, *18*(2), 211–228.

Kesteven, S., (2015), 'Senior constable reflects on change in outback mining town of Glenden', ABC News, 15 December. http://www.abc.net.au/news/2015-12-15/glenden-senior-constable-reflects-on-seven-years-in-outback-town/7029646>

Langton, M., & Mazel, O. (2008). Poverty in the midst of plenty: Aboriginal people, the 'resource curse' and Australia's mining boom. *Journal of Energy & Natural Resources Law*, *26*(1), 31–65.

Lawrie, M., Tonts, M., & Plummer, P. (2011). Boomtowns, resource dependence and socio-economic well-being. *Australian Geographer*, *42*(2), 139–164.

Lockie, S., Franettovich, M., Petkova-Timmer, V., Rolfe, J., & Ivanova, G. (2009). Coal mining and the resource community cycle: A longitudinal assessment of the social impacts of the Coppabella coal mine. *Environmental Impact Assessment Review*, *29*(5), 330–339.

McIntosh, A. (2012). Thinking space: Ten truths about Australia's rush to mine and the mining workforce. *Australian Geographer*, *43*(4), 331–337.

McKenzie, F., Martin, J., Paris, C., & Reynolds, J., (2007). Mobility and multiple residential dynamics in contemporary city regions. *State of Australian Cities Research Network*.

McKenzie, F. H. (2010). Fly-in fly-out: The challenges of transient populations in rural landscapes. In Luck, G., Black, R. & Race, D. (Eds.), *Demographic change in Australia's rural landscapes* (pp. 353–374). Dordrecht: Springer.

McKenzie, F. H., Brereton, D., Birdsall-Jones, C., Phillips, R., & Rowley, S. (2008). A review of the contextual issues regarding housing market dynamics in resource boom towns. *AHURI Positioning Paper*, *105*, 1–42.

Petkova, V., Lockie, S., Rolfe, J., & Ivanova, G. (2009). Mining developments and social impacts on communities: Bowen Basin case studies. *Rural Society*, *19*(3), 211–228.

Phillips, K., (2016), 'The mining boom that changed Australia', ABC News, 13 April. http://www.abc.net.au/radionational/programs/rearvision/the-mining-boom-that-changed-australia/7319586>

Queensland Government Statisticians Office, QGSO, (2016), *Isaac Region report 2016*, Brisbane: Queensland Treasury and Trade, https://statistics.qgso.qld.gov.au/profiles/qrp/resident/pdf/9nknmg5vy0bredigmtasvl0ka7u6of99j8cfhonh1s3gjbqzmk5fsb5jvftbvf4i9o6w25xomd8ewqkws0mhqfsen6rd3rzbhacmhno9xetp1pgnfgsluxxxvx96xxz3/qld-regional-profiles-resident#view=fit&pagemode=bookmarks>

Rolfe, J., Greer, L., Akbar, D., Yabsley, B., Yabsley, E., & Makiela, S. (2008). Bowen basin regional housing demand: Identifying the preferences of mining employees. Milestone Report Four prepared for Department of Tourism, Regional Development and Industry (DTRDI).

Rolfe, J., Miles, B., Lockie, S., & Ivanova, G. (2007). Lessons from the social and economic impacts of the mining boom in the Bowen Basin 2004-2006. *Australasian Journal of Regional Studies*, *13*(2), 134.

Tonts, M., & Plummer, P. (2012). Natural resource exploitation and regional development: A view from the west. *Dialogue (Academy of the Social Sciences in Australia)*, *31*(1), 19.

Tulip, P. (2014). The effect of the mining boom on the Australian economy. *RBA Bulletin, December Quarter*, 17–22.