Research Brief

Economic correlates of Net Interstate Migration to the NT (NT NIM): an exploratory analysis

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RESEARCH AIM

This research examined relationships between economic conditions across Australia and rates of net interstate migration (NIM) to the Northern Territory (NT) since the late 1970s. The research is based on evidence that migration into and out of the NT is largely driven by economic factors, and an assumption that relatively advantageous economic conditions in the NT should therefore lead to increased in-migration and/or decreased out-migration. The research examined correlations between NT NIM and variables relating to employment, cost of living, state and national income, and residential property prices. The research included analysis of direct correlations between these variables and NT NIM, changes in these variables associated with 'eras' of positive and negative NIM, and the impact of changing differentials between NT economic conditions and conditions in other states and the ACT.

KEY FINDINGS

- There have been strong links between housing costs, particularly in Sydney, and NT NIM. Lower housing costs in Sydney and Australian capital cities as a whole are associated with positive NT NIM. Lower housing costs outside of the NT may make it easier for migrants to take the risk of moving here, confident they can re-enter the housing market if the move to the NT turns out to be short-term;

- Falling youth unemployment and increasing job availability in many states, but particularly the 'peripheral' states of Queensland, Western Australia and Tasmania are linked to positive NT NIM. This suggests the presence of a national 'peripheral migration system' to which the NT is attached;

- The NT tends to have positive NIM when its employment conditions are similar to those in other peripheral states, which suggests the NT does not necessarily benefit from having a competitive advantage over these states;

- Relatively high cost of living in Australia may make people more likely to consider a move to, or to stay in, the NT because the NT is then not so disadvantaged by its usually higher cost of living;

- Economic conditions within the NT appear to have limited impact on NT NIM, with higher housing costs and higher unemployment actually linked to positive NIM.

1. Background

Evidence from a survey of 1500 residents of the Northern Territory (NT) in 2006 suggested in and out migration are both motivated strongly by economic considerations (Carson, 2008). Around two-thirds of migrants moved to the NT for employment reasons, and more than one half were planning to leave for reasons relating to employment, housing or living costs. These latter two are interesting, because they do not appear to influence decisions to migrate to the NT to any great extent. It has been previously argued (Taylor, 2010) that housing costs and costs of living for many economically active NT residents are not comparatively high because of the high wages available in the NT. High wages, rather than low cost of living, have traditionally been part of the attraction for 'escalator' migrants (Martel et al., 2013) looking for career development. However, once people reach a certain level of income security (i.e. they could now achieve a similar income elsewhere in Australia) or insecurity (i.e. they are not guaranteed to sustain that income even in the NT, or cannot increase income relative to new costs associated with having a family, buying a house etc.), these costs may become important factors in out-migration decisions.

Economic (particularly employment) drivers of migration to sparsely populated or remote areas are common internationally (Halseth, 1999), however, there has been very little research into the extent to which broad national economic conditions influence the number of people who choose to migrate to one of these 'peripheries'. Most research focusses on either individual motivations (independent of broader conditions) or conditions in the destination area itself. Generally, migration theory would suggest the expectation of better economic outcomes in a new location combined with poor outcomes in the existing location will lead to increased migration flows (Czaika, 2015).

The research into migration within countries (called here 'interstate migration', but also called 'domestic' or 'national' migration when looking at moves that might not cross provincial borders) has tended to assume that moves are made for the long term. Much less research has considered situations where people may intend to move temporarily, as is often the case with moves to places like the NT. Indeed, the NT 2006 survey found a very high proportion of respondents had only intended to stay in the NT for short periods of time (typically less than five years) when they first moved. In these circumstances, there is some evidence that migration requires both good conditions in the destination (typically a guaranteed job or high job availability) and good conditions or prospects for good conditions in the generating region (Edwards & Huskey, 2014). This latter is important to reduce the risk of moving, particularly when moving long distances to unknown locations. Good conditions 'back home' mean the migrant can be confident of a secure economic place in the home location if the move turns out to be unsatisfactory, or to only last a short period of time. This desire for reduced risk may help explain why unemployed people do not always move to locations with better job prospects (Basile et al., 2012).

This research explores the extent to which interstate migration to the NT may be driven by economic conditions in other parts of Australia, looking both at internal conditions and the differences between conditions in the NT and elsewhere. It aims to contribute to understandings of drivers and patterns of migration to remote or sparsely populated areas, and to provide some insights into how changes in migration patterns (specifically positive or negative net interstate migration (NIM) might be the outcome of particular economic conditions.

The NT is an interesting case example for this sort of research because its recent NIM history has been marked by clearly identifiable 'eras'. From the time of self-government (1978) until 1985, the NT received more interstate migrants each year than departed (positive NIM 'era'). Between 1986 and 1994, the NT had more

departers than arrivers each year (negative NIM 'era'). This was followed by a positive NIM era 1995-7, a negative NIM era 1998-2004, a positive NIM era 2005-9, and a negative era from 2014 until at least 2015 (the most recent data). In all these eras, only one year (2006, when there was negative NIM) had a NIM outcome contrary to the general position of the era.

This pattern of eras suggests the overall interstate migration system for the NT has some level of periodicity. Periods of (especially) negative NIM are somewhat persistent, and changes in the direction of NIM are often abrupt. Figure 1 shows the volume of NIM for each year between 1979 and 2014. While there is some evidence of NIM beginning to change prior to transitions from one era to the next, it is by no means a clear and consistent pattern. NIM was declining before the 1995 transition to a positive era, and the transition to 2010 was off the back of gradually declining NIM at the end of the positive era, but a sharp decline at the start of the negative era. Examining changes in economic conditions across Australia at these points of transition may reveal the key drivers of NT NIM.

Figure 1: Net Interstate Migration (NIM) for the Northern Territory (NT) 1979-2014
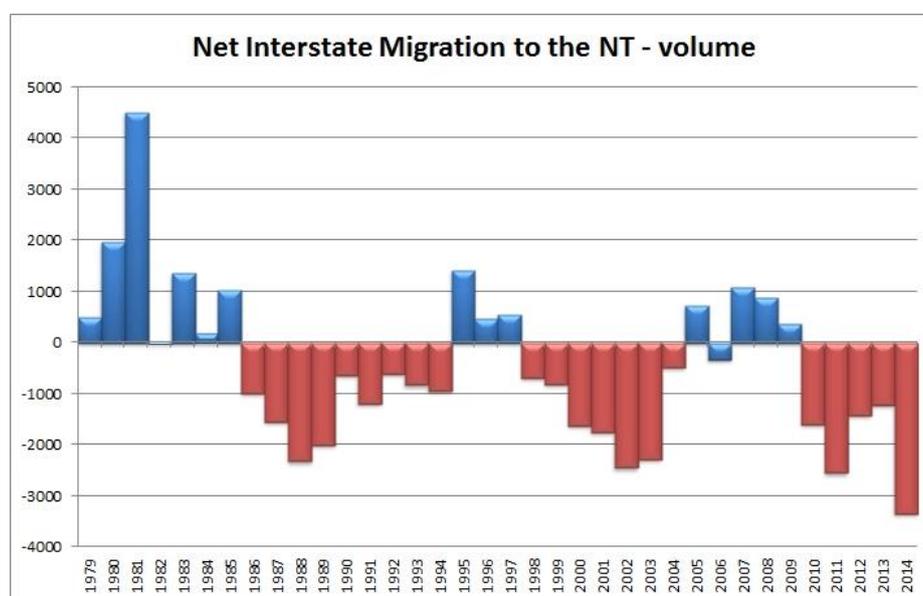
Previous research (03-2016) suggests the NT has been subject to a variety of conditions affecting NIM. Each era transition has, for example, resulted from a different mix of increase and decline in in-migration and out-migration. For example, the transition to the 1995-97 positive era was marked by increases in both in and out-migration, while the transition to the 2005-9 era was marked by a decrease in out-migration but no increase in in-migration. That analysis also showed different sources of interstate migrants have been prominent over time, with a shift from relatively strong markets in South Australia and Western Australia in the 1980s, to stronger (proportionally) markets in Victoria and New South Wales in the 2000s. Consequently, economic conditions in individual states, and the differential between NT and other State conditions may be more important than national conditions. Furthermore, economic conditions as measured by these standard indicators may not even be critical to NT NIM, with migration at least sometimes driven by major projects (primarily resources and construction) that are not necessarily linked to economic cycles (Carson et al., 2010), and the vagaries of national government transfers that may only be loosely linked (Carson, 2011).

The intent of this brief is not to describe the economic conditions associated with each era *per se*, but to investigate whether there has been a consistent set of conditions associated with transitions between eras.

Consistency would be reflected both in positive eras being associated with similar changes in economic conditions, and negative eras being associated with opposite changes (or at least dissimilar changes) in those same conditions. The types of conditions which might be important include employment and job opportunities, costs of housing and the general cost of living, and general economic prosperity (as reflected in Gross State and National Product indexes, for example).

2. Conceptual Considerations

The research task is potentially a very complex one, with a number of methodological and conceptual considerations. In the first instance, analysis is limited to including those variables available in a consistent form for sufficient time. While some (mostly employment related) variables have been available for the entire time, many were not consistently available until the mid-1980s. Consequently, there is limited information about the first positive era.

Secondly, there is always a time lag between the decision to migrate and the act of migration, just as there is likely to be a time lag between changes in economic conditions and the decision to migrate. There is no real way of calculating how long these lags might be, although the 2006 NT survey suggested many people made the decision to move to the NT within a very short period. Spontaneous decision making may be another feature of the intended temporariness of moves to the NT, but it may also be the 'spontaneity' was the selection of the NT as a destination, while conditions which stimulated thoughts about needing or wanting to move had been emerging for some period of time.

Thirdly, it is not clear from the literature the extent to which migration decisions may be inspired by actual economic conditions (whether there are many or few jobs available in an absolute sense), changes in economic conditions (whether there are more or fewer jobs available this year compared with last year), or relative economic conditions (whether there are more or fewer jobs available in a source location than in a potential destination).

Finally, economic conditions are often closely related to one another, and it may be a combination of conditions which lead to migration rather than individual conditions. Constructing a model which considers the relative contribution of a range of conditions to NT NIM may not only be very difficult, but may be practically impossible given the number of conditions that could be considered and the multiple ways they could be construed (as described in the previous paragraph).

Overall, spontaneity of decision making, and intended short term migrations, likely make places like the NT different to other destinations for interstate migrants (Carson et al., 2010). Migration 'clusters' (whether favouring in- or out-migration) may emerge almost coincidentally, and the conditions which precede one cluster may not have the same impact at a different point in time.

This research makes some attempt to respond to these complexities, but its main contribution may be as much in identifying avenues for further research as in presenting any definitive case for particular relationships between economic conditions and NT NIM over time. To manage the issue of data availability, a lot of attention will be paid to analysing just the most recent four NIM eras (two positive and two negative). This may be useful anyway, given conditions in the early 1980s were still substantially impacted by the 1970s migration disruptions that accompanied Cyclone Tracy (1974) and self-government (1978). To manage the issue of lags, the research will include analysis of conditions up to three years in advance of changes in NIM. To manage the issue of absolute versus relative conditions, the research will include three interpretations of each variable – its absolute value at time X, the change in value between time X and time X-1, and the difference between its absolute value and the value for the corresponding variable in the NT. The analysis also considers

the broad 'sign' of changes in conditions (Was unemployment going up or down, irrespective of by how much? Were there more or fewer jobs available in the NT than in Queensland, irrespective of how many more or fewer?). The research finally includes construction of a series of logistic regression models which explore how combinations of variables might be related to years in which the NT experienced positive NIM.

A focus on the direction rather than volume of change is particularly relevant when it comes to comparing indicators in the NT and elsewhere. Economic data for the NT are notoriously difficult to interpret both because of data quality issues (NT data are subject to high errors because of low sample sizes in economic surveys) and behavioural issues. Employment and housing markets are somewhat artificial as a result of the high turnover of population particularly in Darwin and Alice Springs. When it comes to unemployment, NT rates remain low because many unemployed people leave the Territory to seek work elsewhere. Similarly, new arrivals tend to already have a job, or quickly find a job even when vacancies are apparently scarce (employers often create jobs for skilled new arrivals). It is therefore sometimes difficult to assess the economic performance of the NT through the types of indicators used in this project. Consequently, small changes in the direction of an indicator may be indicative of relatively large economic changes that are not implied by the actual value of the indicator.

3. Methods

Data were drawn from various Australian Bureau of Statistics collections –

1. Interstate migration, 1979-2014: Catalogue Number 3105.0.65.001;

2. Unemployment rates, 1979-2014: Catalogue Number 6202.0;

3. Youth unemployment rates (National 1979-2014, States and Territories 1986-2014): Catalogue Number 6202.0;

4. Job vacancies (National 1979-2014, States and Territories 1983-2014): Catalogue Number 6354.0;

5. Consumer Price Index (Capital cities and average of all capital cities 1979-2014): Catalogue Number 6401.0;

6. Residential Property Price Index (Capital cities and average of all capital cities 1992-2014): Catalogue Number 6416.0; and

7. State and National Gross Domestic Product, 1991-2014: 5206.0.

Consumer Price Index (CPI) was used as an indicator of costs of living, Residential Property Price Index (RPPI) was used as an indicator of housing costs/availability, and Gross Domestic Product (GDP) was used as an indicator of the overall economic position of the jurisdiction. Variables were expressed as actual value in the target year, as amount of change from previous year, and as direction of change (increase or decrease) over the previous year. Variables were also expressed in terms of the difference to the NT value for that variable (NT value minus other value), and the direction of change in relation to the NT value since the previous year (increased difference or decreased difference).

Relationships between NT NIM and other variables were first explored using direct correlation, with a significant correlation assumed at $p > 0.1$. Variables were initially correlated with both NIM value and NIM as a percentage of the NT population (NIM rate). There was almost a perfect correlation between these two variables ($r = 0.97$) so the analysis subsequently focussed on NIM rates. Correlations were then performed between NIM rates in year x and variable values 1 year, 2 years, and 3 years prior to year x to test for lag effects.

More detailed analysis was then conducted around the NIM 'eras', with a focus on the most recent three negative NIM eras (1986-95; 1998-2004 and 2010-14) and two positive eras (1995-97 and 2005-09). Average values of the variables within each era were compared to see if positive eras were consistently different to negative eras. 'Substantial' (rather than 'significant') differences in average were assumed when the difference was greater than the standard deviation of annual change in that variable. A consistent substantial relationship was assessed to occur if the direction of difference in average between neighbouring eras was the same (e.g. if the variable was higher in both positive eras compared with the proceeding negative era) and if the direction of difference between positive and negative eras was opposite to the direction in difference between negative and positive eras, and at least one change was greater than the standard deviation. This is illustrated by example in Table 1.

Table 1: Identifying substantial relationships between variables and eras

Variable	Standard Deviation of change (1986-2014)	Change between negative era 1 (ne1) and positive era 1 (pe1)	Change between ne2 and pe2	Change between pe1 and ne2	Change between pe2 and ne3.
Example Variable	2.00	2.46 Greater than standard deviation	1.86 Same direction of change between era types	-2.81 Greater than standard deviation	-0.98 Same direction of change between era types and opposite direction to obverse change.

This analysis was then repeated looking at the differences between the variable in the last year of an era and the first year of the proceeding era, and in the last two years of an era and first two years of the proceeding era. Finally, the analysis considered simply whether the direction of change between the last year of one era and the first year of the next era was positive (increase variable value) or negative, and whether changes from negative to positive eras were internally consistent and opposite in direction to changes from positive to negative eras.

A series of logistic regression models were constructed which measured the extent to which combinations of economic indicators could be used to predict either a positive NT NIM year or a negative NT NIM year in the period since 1995 (when all variables were available). The models were limited by the number of variables and the number of positive NIM years that could be included (seven). Models were therefore constructed separately for national indicators, and indicators within each State and Territory. Variables in contention for the model were – unemployment, youth unemployment, job availability, CPI, RPPI and GDP. Variables included in the model were those with the fewest significant correlations with other variables in contention. Models were deemed to perform better than chance if any component variable was a significant predictor of NT NIM year type (p>0.1).

4. Results

4.1 Direct correlations

There was a significant negative correlation between NT NIM and Sydney RPPI. However, there was a positive correlation between NT NIM and changes in the difference between Darwin RPPI and Sydney RPPI. In other words, as Darwin property prices increased relative to Sydney prices, NTNIM also increased. This was repeated for changes in Darwin RPPI relative to RPPI in Brisbane, Hobart and Canberra, and the average of all capital cities. Interestingly, there was not a significant correlation between Darwin RPPI itself and NT NIM, so the critical issue was not the value of Darwin RPPI or the amount it changed, but the value and rate of change compared to those other capital cities.

There was, however, a significant positive correlation between Darwin RPPI and NT NIM two and three years later. In other words, NT NIM increased after Darwin RPPI increased. NT NIM also increased three years after NT youth unemployment increased. There were no other lag effects observed in the direct correlations.

3.2 Analysis of eras

In the two years prior to the positive NT NIM eras of 1995-7 and 2005-9, overall unemployment in Queensland dropped substantially (by around 2% on each occasion), and youth unemployment fell in all states and territories except South Australia. Job availability rose in New South Wales, Victoria, Queensland and nationally, and New South Wales and national GDP rose. NT's unemployment and youth unemployment rates grew relative to those in Queensland, Western Australia and Tasmania, but not relative to the other states and the ACT. Transition to negative NIM eras, however, occurred during rising youth unemployment in NSW, and declining CPI in all states but not the ACT. Interestingly, transition to negative eras coincided with rising job availability in QLD, just as transition to positive eras. The variables that met the requirement of consistent changes for the type of era change and opposite changes for opposite era transitions were –

- Hobart RPPI (rising prior to positive eras and falling prior to negative ones);

- Change in unemployment rates in Tasmania (unemployment falling prior to positive eras and rising prior to negative ones); and

- The differential between NT unemployment and unemployment in New South Wales and Victoria (NT having higher unemployment before positive eras and lower unemployment before negative ones).

Focussing on conditions one year prior to transition in eras did not reveal any further relationships.

Removing the requirement for a large degree of change and focussing just on the direction of change in a variable tended to reinforce the findings already reported. Table 2 lists the variables which consistently changed direction at the transition from one period to another and changed in opposite directions with opposite transitions. Two methods were used to identify these variables – change in the average value between positive and negative eras, and change in the value from the last year of an era to the first year of the next era. The method which led to identification of the variable is identified with an asterix in Table Two. The second half of the table examines changes in the difference between NT variable values and those of other jurisdictions. A positive outcome means there was an increasing gap between NT and the other jurisdiction's value. Whether NT values were typically higher or lower is identified next to the variable name.

Table 2: Variables associated with changes in NT NIM eras

Variable	Direction transition to positive era	Direction transition to negative era	Era average	Transition year
WA youth unemployment	-ve	+ve		*
QLD job availability	+ve	-ve	*	
SA job availability	+ve	-ve	*	
WA job availability	+ve	-ve	*	
TAS job availability	+ve	-ve	*	*
Sydney RPPI	-ve	+ve	*	*
Melbourne RPPI	-ve	+ve		*
Brisbane RPPI	-ve	+ve		*
Perth RPPI	-ve	+ve		*
Hobart RPPI	-ve	+ve		*
Canberra RPPI	+ve	-ve	*	
Average capital city RPPI	-ve	+ve	*	*
QLD GDP	+ve	-ve	*	
WA GDP	-ve	+ve		*
Australia GDP	-ve	+ve	*	*
Melbourne CPI	+ve	-ve	*	
Adelaide CPI	+ve	-ve	*	
Average capital city CPI	+ve	-ve	*	
Difference between NT and -				
QLD unemployment (NT lower)	-ve	+ve	*	
ACT unemployment (NT lower)	-ve	+ve	*	*
NSW youth unemployment (NT lower)	-ve	+ve	*	
QLD youth unemployment (NT lower)	-ve	+ve	*	*
SA youth unemployment (NT lower)	-ve	+ve	*	
WA youth unemployment (NT lower)	-ve	+ve	*	
ACT youth unemployment (NT lower)	-ve	+ve	*	
Australia youth unemployment (NT lower)	-ve	+ve	*	
NSW job availability (NT higher)	-ve	+ve		*
QLD job availability (NT higher)	-ve	+ve	*	
WA job availability (NT higher)	-ve	+ve	*	
TAS job availability (NT higher)	-ve	+ve		*

Generally, variables of the same kind but in different jurisdictions were associated with positive and negative eras in the same way. For example, positive changes in job availability were associated with transitions to positive NT NIM eras in all cases. However, increases in the Canberra RPPI were associated with transition to positive eras, while decreases in other city RPPI's were associated with such transitions. Similarly, while WA and Australian GDP declined during transition to positive eras, QLD GDP increased. For each variable where changes in the difference between NT value and other value appeared important, transitions to positive NIM

eras were marked by a contraction of the difference between those values. In other words, transition to positive eras were marked by relatively small differences between NT and other State's and national economic indicators.

3.3 Logistic regression

High correlations between independent variables meant only three were included in the final models – CPI, RPPI, and unemployment. The null model predicted 65% of NT NIM outcomes. Table Three shows the performance of the Australian and jurisdictional models, identifying independent variables deemed to make a significant contribution to the model, the value at which the model predicts that variable as related to a positive NT NIM year, and the average value of that variable.

Table 3: Performance of logistic regression models using State based variables to predict NT positive and negative NIM years 1995-2014.

Model	% positive NIM years predicted	% negative NIM years predicted	Overall % predicted	Variable (average 1995-2014)	Intercept
Australia	71	85	80	RPPI (7.0)	-5.8
NSW	71	77	75	RPPI (6.9)	-4.2
VIC	29	92	70		
QLD	14	100	70		
SA	14	77	55		
WA	29	92	70		
TAS	0	77	50		
NT	14	77	55		
ACT	57	85	75		

Only the Australian and NSW models predicted NT NIM years better than chance, and in both cases, the significant variable was RPPI. Negative RPPI, particularly in NSW, is a predictor of positive NT NIM.

5. Conclusions

This brief reports on relatively naïve examinations of the relationships between NT NIM and economic indicators across Australia. Variables were not manipulated except when presented as a comparison between the NT rate and the rate in other jurisdictions. Nevertheless, some potentially interesting findings emerge relating to specific indicators.

Housing costs (as indicated by RPPI) appear to be very important correlates with NT NIM. In particular, decreasing housing costs in Sydney are linked to increasing and positive NT NIM. This is also the case (but not so clearly) with housing costs in other capital cities with the exception of Canberra. There is also some evidence that increasing housing costs in Darwin might be linked to increasing NIM, although this relies on assumptions about the lag between changes in economic conditions and changes in NIM which might not be supported by other evidence presented here. It is unlikely existing volumes of movement to the NT would cause housing costs elsewhere to decline. What is more likely is relatively accessible housing markets in the

place of origin increases the chances people will take a risk on moving to the NT – based on an expectation they can get back into the housing market when they return. In contrast, high housing costs might mean potential migrants 'get stuck' in the places of origin, unwilling or unable to risk leaving the housing arrangements they have. This may be particularly the case for younger migrants, who continue to be the most important group (both moving to and away from the NT). The corresponding expectation of a short stay in the NT may explain the relative lack of importance of housing costs here.

The importance of relatively young migrants is emphasised by the relationships between youth unemployment and NT NIM. Low youth unemployment across Australia was associated with transition to positive NIM eras for the NT. This may seem counter-intuitive, but the expectation of both finding a job in the NT and finding a job when returning from the NT may influence the decisions of young migrants. Those who are in the NT may stay longer if they remain confident of a good job market 'back home', and people considering a move may do so if they have confidence in getting a job wherever they may move. This may further be evidenced by the particular relationships to unemployment (and particularly youth unemployment) and job availability in Australia's other 'peripheries' (QLD, WA and Tasmania in particular). When there is high availability of jobs in these markets (the first two of which may also be linked by industry of employment), there generally may be more people from the core states (Victoria and NSW/ACT) willing to move relatively long distances. However, this symbiotic relationship with other peripheries can become a competitive relationship, with higher job availability in Queensland linked to transition to negative NT NIM eras, along with increasing GDP in Western Australia. This might reflect on the competition for resource and construction sector jobs which become more specialised (and hence the competition more fierce) as project life cycles unfold.

The argument there may be some more general migration system for the 'peripheries' and not just for the NT is supported by the observation (Table Two) that NT NIM improves when NT conditions are more similar to those in other states (and particularly the peripheral ones), even if this means having less of a comparative advantage (particularly when it comes to employment markets). NT NIM may be stimulated by migrants seeing the NT as one of the potential 'distant' destinations they can choose (whether to move, or to stay there). When conditions in other peripheries decline, even if those in the NT do not, 'peripheral migration' generally becomes less of an option.

This may also partially explain why positive NT NIM eras tend to coincide with rising CPI across Australia. Rising CPI, along with falling (youth) unemployment and relatively low housing costs may give potential migrants confidence that comparatively expensive places, like the NT, are affordable to either move to or stay in.

Following this, there is a need to expand this research beyond the NT to develop a better understanding of 'peripheral migration' systems in Australia in general, and the NT's role in those systems. Knowing the extent to which migrants from core states select NT or another periphery, or move through the peripheries, may help decide how to position the NT for future peripheral migration waves. Likewise, understanding how the NT is similar or different to other peripheries based on age, sex, occupation and industry of migrants might be important. Is it only resources and construction 'booms' which foster positive NIM in the peripheries, or might there be other sectors of economic activity that can also impact? Developing such a view of peripheral migration systems would also benefit from comparisons with jurisdictions with similar peripheries (northern provinces of Canada, Alaska, northern counties and countries of the European Arctic and sub-Arctic).

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