The returns to migration and human capital accumulation pathways: Non-metropolitan youth in the school-to-work transition

Abstract

The school-to-work transition comprises a critical period of human capital development for young people. As school-to-work pathways become increasingly diverse and complex, there is growing evidence that transitions during this period significantly influence individual career trajectories and long-term earning capacities. For non-metropolitan youth, this period of the life course often involves migration to urban centres in the search for better educational and employment opportunities. Drawing on longitudinal data, this paper examines the influence of migration and school-to-work pathways on entry-level wages for non-metropolitan youth in Australia. Our results highlight that migration from non-metropolitan communities to urban centres leads to higher entry-level wages, but these wage gains are not immediate, rather they are realised at a period three years post-migration. Individuals remaining in non-metropolitan communities were found to experience pathways that lead to lower wage returns. Furthermore, unobserved attributes, such as motivation and aspirations were found to be a major factor explaining the higher wage returns achieved by non-metropolitan migrants. Findings have important consequences for policy in their potential to contribute to new evidenced-based policy designed to entice the return of young people to non-metropolitan communities and ameliorate the longstanding net loss of young population from regional areas.

Keywords: Human capital development; school-to-work transitions; migration; non-metropolitan areas.

JEL: J61, J31, I26

1. Introduction

The loss of young people is a long-standing demographic phenomenon in non-metropolitan areas of many industrialised countries (Bell and Hugo 2000; Artz 2003). Affected by declines in labour force opportunities driven by technological change and increased mechanisation, non-metropolitan communities have historically experienced out-migration of young individuals to urban centres where they pursue education, employment opportunities and a more vibrant social environment (Corcoran et al., 2010; Gottlieb 2011; Rowe 2013; Tang et al. 2014, 2016). For many young individuals from non-metropolitan areas, migration to major cities is an essential component of the transition from school into further education and the workforce, as this move enables access to education and job opportunities not available in the local community (Winters 2011; Rowe et al. 2014b). While the out-migration of young individuals from non-metropolitan communities is well documented, little is understood about how this migration interacts with pathways into employment and influences subsequent earning capacity.

School to work transitions comprise a critical period of human capital development for young people. There is growing evidence that transitionary pathways during this time are both diverse and complex. For non-metropolitan youth, successful completion of such transitions may necessitate relocation to urban centres as opportunities for further education and employment may not exist in the local community. Yet there is limited empirical research on the educational and labour market trajectories of individuals after migration, particularly about the way they evolve over an extended period of time (Cushing and Poot 2004; Newbold 2012). A better understanding of the pathways young people take post-schooling, and the influence such pathways on future wages is needed to inform strategies to curtail net migration loss of young people from non-metropolitan communities and to entice youth to return to their community of origin after a period of urban living.

Migration to urban centres is thought to enhance the educational and employment outcomes of people in their transition from school into higher education and the labour market. There is consistent evidence that migration to metropolitan areas leads to higher earnings (Glaeser and Maré 2001; Mills and Hazarika 2001). In the United States, Glaeser and Maré (2001) reported that non-metropolitan migrants experienced a wage premium of 8 to 12 percent compared to those staying behind. Rapid human capital accumulation is argued to underpin this wage premium in metropolitan locations (Glaeser 1999; Peri 2002). However, the dynamics of human capital accumulation following migration to metropolitan areas remain poorly understood and some research suggests migration can disrupt transitions into employment (Rowe et al. 2014b).

To expand understanding of the interplay between school to work transitions, migration and wages, this paper aims to determine the wage returns to migration for young people from non-metropolitan areas and to examine the impact of the pathways these individuals follow in their school-to-work transitions on their wage outcomes. To this end, we use a three-stage analytical approach, drawing on data from the 2003 Longitudinal Survey of Australian Youth (LSAY). First, kernel density plots and significance tests are used to compare wage outcomes at the age of 25 for young people who lived in a non-metropolitan area at the age of 15 and migrated to a metropolitan location after leaving school (non-metropolitan migrants) against two other groups: those who remained in non-metropolitan communities after leaving school (non-metropolitan stayers) and those who remained in metropolitan locations (metropolitan stayers). Second, sequence analysis techniques in combination with quantile regressions are employed to define representative school-to-work

pathways, and determine their role in explaining wage differentials between non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers. Third, a quantile decomposition approach is performed to determine the main source of wage differentials between these groups. It seeks to measure the selectivity effects of migration by decomposing wage differentials into differences in individual attributes (observed characteristics) or in the remuneration of those attributes (unobserved attributes and skills).

This study expands existing research on graduate mobility in two important ways. First, it examines the school-to-work pathways and wage outcomes of school and vocationally-educated young people, extending the focus of existing research which centres on university graduates. Second, it employs a longitudinal approach based on sequence analysis to examine the influence of individual trajectories on shaping the wage outcomes of young people in early working life. Together, these contributions provide a basis for better assessment of the performance of university graduates in the labour market, and assist development of policies to enhance labour market outcomes for young people. This is achieved by identifying the school-to-work trajectories more likely to result in low wage outcomes so that timely interventions can be implemented.

The paper is organised in six sections. The next section reviews the literature on the school-to-work transition and the role of migration. Sections 3 and 4 present the data used in the analysis and describe the methodology. Section 5 discusses the results and Section 6 summarises the main findings.

2. School-to-work transitions, migration and entry-level labour market outcomes

The transition from school to work is a critical period of young people's lives. In particular it represents a crucial stage of human capital development during which education and employment experiences can shape lifelong career trajectories. The school-to-work transition cannot be described as a single, abrupt movement from full-time education to full-time employment. Rather, it is becoming increasingly longer and more complex (Shanahan 2000). It has been conceptualised to extend from age of 15 to 25 and to involve a sequence of transitions, beginning when educational pathways start diverging and ending around the time a young person secures full-time employment (OECD 2000). This transitory period may involve several intermediate statuses between education and work, such as vocational programs and higher education, breaks from education and work, and status reversals, involving movements from the labour market back into education and *vice versa* (Raffe 2011).

The complexity and diversity of school-to-work transitions make the identification of distinctive school-to-work pathways challenging (Ryan 2001; Sweet 2001). Most studies examining school-to-work transitions focus on educational attainment levels and discrete life events, such as the decision to enter university, but fail to identify distinct school-to-work *pathways* and associated labour market outcomes (e.g. OECD 2000; Karmel and Liu 2011). Results from this research emphasise the importance of particular educational and employment opportunities for facilitating successful transitions into the labour market. Opportunities that enhance a young person's human capital, such as completing high school, acquiring a post-school qualification and/or work experience, are associated with better employment outcomes, lower unemployment and higher wages (Oreopoulos and Salvanes 2009; OECD 2014). The opposite is also true with early school leavers and those without post-school education more likely to be unemployed (Wyn and Lamb 2006). While

research on individual transitions provide some insight into the influence of education and opportunities on labour force entry, they overlook the complexity and diversity of timing, order and duration of school-to-work pathways (Brzinsky-Fay 2014).

For young individuals from non-metropolitan communities, accessing educational and employment opportunities that facilitate successful long-term career trajectories and higher wages can often necessitate migration to urban centres. Thus, the school-to-work transitions of non-metropolitan youth are further complicated by physical mobility. Migration has wide-ranging social and economic consequences for individuals. Beyond the logistics of the physical move, migration can impact family and social ties and alter daily routines as well as generating changes in labour market outcomes (Bartel 1979; Hunt and Kau 1985). In the United States and Europe, empirical research indicates that young people who move from non-metropolitan communities to metropolitan areas earn up to 12 percent more than their counterparts who remain in non-metropolitan areas (Glaeser and Maré 2001). While there is certainly evidence of a wage premium in urban agglomerations (Peri 2002; Wheeler 2006; D'Costa and Overman 2014), the magnitude of migrants' wage increases is dependent on the size of the destination city. Wheeler (2006) found that post-migration annual wage growth in the USA was positively associated with the size of the destination labour market. Large and economically diverse metropolitan labour markets are argued to accelerate wage growth, enhancing workers' productivity and skills matching by offering a varied array of employment opportunities and intensifying knowledge spillovers (Peri 2002; De la Roca and Puga 2014).

Differences in the timing of these wage gains, relative to the timing of migration, have also been identified. In Britain, earning increases are found to be accrued in the first year following migration to metropolitan areas (D'Costa and Overman 2014). In the United States, while small wage increases are observed in the year immediately following migration, the majority of wage growth occurs after the second year in metropolitan areas (Glaeser and Maré 2001; Yankow 2003, 2006). Young individuals from non-metropolitan areas have been found to experience wage increases of up to 15 percent between 3 and 5 years after arriving in a metropolitan location (Glaeser and Maré 2001). It is during this period that wages of non-metropolitan migrants appear to "catch-up" with metropolitan locals (Yankow 2006). A process of knowledge formation and social adjustment to the metropolitan environment is argued to underpin the lag in post-migration wage growth and the initial wage gap between migrants and locals (Glaeser 1999; Wheeler 2006).

Importantly, the knowledge and skills acquired during this process appear to be transferable and provide a wage premium in non-metropolitan labour markets. Wage increases experienced by non-metropolitan migrants persist after they return to their community of origin with returnees earning higher wages than locals. This trend is particularly pronounced among university graduates (Yankow 2006). Urban economic theories suggest individuals who spend time in metropolitan areas accumulate greater human capital and this accounts for higher wages on their return to their origin community (Glaeser and Maré 2001; Peri 2002). However, the individual pathways through which young people accumulate this human capital during their transition from school into the workforce remain unclear. In the current paper, sequence analysis is proposed as a methodological tool to capture the complexity and diversity of school to work pathways experienced by non-metropolitan migrants (McVicar and Anyadike-Danes 2002). This method has been applied previously to identify representative school-to-work transitions in European countries (Brzinsky-Fay 2007; Corrales-Herrero and Rodríguez-Prado 2012).

Previous studies employing sequence analyses to examine school to work pathways of the general population have identified a number of factors that appear to influence the school-to-work transitions of young people. Parental education and employment patterns are major determinants of education and employment trajectories (Le and Miller 2002; McVicar and Anyadike-Danes 2002; Raffe 2011). Youth whose parents have lower levels of education and are unemployed are less successful in their school to work transitions than their counterparts whose parents are university educated and employed in highly skilled occupations (Baxter 2002; McVicar and Anyadike-Danes 2002). Gender is also a key determinant of school-to-work transitions, with women displaying lower labour participation rates than men (Iannelli and Smyth 2008). While the majority of these studies have been conducted in the United States and the United Kingdom it is reasonable to suggest that the school to work transitions of Australian youth will be influenced by similar factors since the Australian national education and labour markets are structured similarly to those in the US and the UK.

Thus, while prior work has identified discrete educational and employment events and demographic and family characteristics that are associated with more successful transitions into the workforce there is limited understanding of the interaction between school-to-work pathways and physical mobility such as that triggered by migration to urban centres by non-metropolitan youth. This is despite the fact that migration during the school-to-work transition is recognised as a key mechanism to enhance human capital development for youth in non-metropolitan communities (Argent and Walmsley 2008; Rowe et al. 2014a, 2014c; Rowe, Tang et al. 2015). Migration to metropolitan areas enables non-metropolitan youth to overcome the restricted supply of higher education in non-metropolitan localities by accessing study opportunities that are not locally available (Bell and Hugo 2000; Knapp et al. 2013). While non-metropolitan communities struggle to entice young people to return to their community of origin following periods of urban based education, little is known about the labour market outcomes of migrating individuals compared to those who stay in non-metropolitan areas, over an extended period of time or whether wage returns persist following return to non-metropolitan communities.

3. Data

We draw on data from the 2003 LSAY, a nationally representative survey that follows one cohort of young people as they move from school into work destinations. Participants entered the study at the age of 15 (2003) and were contacted annually for a period of 10 years. The survey collected information on each individual's postcode, place of residence, family, education, work and social development.

At wave 1 (2003) the LSAY sample comprised 10,370 individuals. Due to attrition, the number of participants decreased over the 10 year period leaving a total of 3,741 at wave 11 (36.1 percent of the initial sample). This level of attrition is considered good and comparable to that for commonly used longitudinal surveys, such as the British Household Panel Survey (BHPS), the Household, Income and Labour Dynamics in Australia (HILDA) and the German Socio-Economic Panel (MIAESR 2012, p. 15).

We note that non-random attrition can lead to sample bias, and result in either or both a statistical power problem or/and a statistical representation problem. In the LSAY data, higher attrition was observed for Indigenous Australians, the least academically successful individuals, people from low

socio-economic households and immigrants (Lim 2011). Attrition is also expected due to migrants as they are more difficult to contact (Buck 2000).

To minimise the effects of attrition, we applied a three-step approach. Two procedures were implemented to address statistical power problems. We first identified 3,439individual records with complete sequences of residential information for all eleven waves. Second, we imputed data for 32 individuals by completing information on place of usual residence missing from a single wave. This resulted in a final sample of 3,478 records. Third, we used longitudinal weights to address potential statistical representation problems. Two types of weights were applied: sample weights and attrition weights. Sample weights were used to ensure that the sample represents the sampled population of 15-years-old school students, and attrition weights were employed to address non-response and ensure that the sample represents the overall population distribution.

4. Methodology

Our methodology comprised three stages. The *first* stage sought to establish the extent to which migration during the school-to-work transition resulted in higher entry-level wages. To this end, two analyses were performed. First, differences in the wage distributions between non-metropolitan migrants and two benchmark groups, non-metropolitan stayers and metropolitan stayers were analysed. Next, we determined the timing of wage returns to migration by examining the median hourly wages of non-metropolitan migrants. The median hourly wages relative to the year of the migration move were measured to capture the temporal dynamics of changes in wages before and after migration.

Non-metropolitan migrants were defined as those who reported a place of residence in a non-metropolitan area in wave 1 and in a metropolitan location in one or other wave by the end of the survey. Non-metropolitan stayers were defined as those who reported a place of residence in a non-metropolitan area during all survey waves. Similarly, metropolitan stayers were defined as those who reported a place of residence in a metropolitan area during all survey waves.

The *second* stage employed a quantile regression analysis to determine the influence of the school-to-work pathway on the wages of non-metropolitan migrants. Hourly wage data from the final wave of the survey (i.e. at age 25) were used as the dependent variable. By measuring wages at the age of 25, we can capture the influence of the sequence of transitions that young people followed through their progression from school to work on wage outcomes in early working life. To account for the right-skewed distribution of wage distributions, quantile regression models at the 50 percentile were used. Separate regression models are estimated for non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers. By comparing the coefficients for school-to-work pathways across these models, the effect of their interplay with migration on wages can be captured.

To isolate the effects of school-to-work pathways on wages, we controlled for a range of personal, family and residential history variables. Dummy variables were included to capture wage differentials according to gender and indigenous status, and differences in young people's educational attainment and employment situation at the age of 25. We also included dummy variables to account for variations in young people's salary outcomes according to their parents' education level. These variables were also considered to test whether the type of pathway that young people followed during their transition from school to work was more influential on

determining their wage outcomes than family background attributes in a country, like Australia focused on the development of generic skills.

Dummy variables capturing the residential history of young people were included in the regression for non-metropolitan migrants. To this end, we consider a linear and a quadratic transformation of the number of years spent in metropolitan locations to account for the positive but decreasing wage returns following migration. We also included dummy variables to capture differentials in salary returns in the urban hierarchy as larger metropolitan areas are expected to pay higher salaries than smaller localities (Yankow 2006). A dummy variable identifying individuals who had returned to a non-metropolitan location was also included. Table 1 describes the variables included in the regression models.

[Table 1. Independent variables for the quantile regression analysis.]

To measure the effect of individual school-to-work pathways on wages, representative sequences of transitions from school into further education and work were identified and entered as dummy variables in our models. To this end, sequence analysis methods, Dynamic Hamming Distances (DHDs) and cluster analysis, were employed.[1] These methods are used to compare and cluster longitudinal sequences of categorical data. These methods were introduced to the social sciences by Abbott and Forrest (1986), and have subsequently been employed in human geography (Rowe, Corcoran et al. 2015) and sociology (Brzinsky-Fay 2007), but have remained largely underutilised in regional science. We use these methods to capture differences in the order, duration and timing of individual transitions between individual sequences that enable us to identify representative school-to-work pathways in our sample. In this paper we specifically focus on transitions within the educational and employment domains between ages 15 to 25.

To measure pair-wise dissimilarities between individual sequences the distances between individual sequences are computed by estimating the cost of transforming one sequence into another. Two types of operations are used to estimate this cost: (1) the substitution of elements in a sequence; and, (2) the insertion and deletion of an element (i.e. the *indel)*. A pair of sequences with small distances means they are similar, while pairs with large distances are more distinct. Because the timing of transitions between educational and employment statuses is important, we used DHD as dissimilarity measure. This measure ensures that less frequent transitions have a greater substitution cost than more common transitions (Lesnard 2010).

The distance between each pair-wise combination of individual sequences is then used in a cluster analysis to identify representative school-to-work pathways. An *around medoids* clustering algorithm was used as it represents a more robust version of the conventional k-means procedure. This is because it clusters the data by minimising a sum of dissimilarities, rather than a sum of squared Euclidean distances (Kaufman and Rousseeuw 2005).[2] The choice of the number of clusters was based on silhouette values, with an average silhouette value greater than 0.5 considered an acceptable partition of the data (Kaufman and Rousseeuw 2005). The analysis was based on transitions between seven educational and employment statuses: school, vocational education, university education, inactivity, unemployment, part-time and full-time work.

[1] The sequence analysis was performed by using the R software Package TraMineR developed by Gabadino et al. (2011).
[2] Medoids are representative objects of a data set whose average dissimilarity to all the objects in a cluster is minimal.

The *third* stage, examined the factors that drive differences in wage distributions between non-metropolitan migrants and stayers (i.e. non-metropolitan stayers and metropolitan stayers) using a quantile regression decomposition approach. It is well established that migration is a selective process. Migrants tend to be characterised by particular demographic and socio-economic attributes e.g. being male, young and educated (Greenwood and Hunt 2003), and also by specific unmeasurable skills and behavioural attitudes, such as being highly motivated and willing to undertake risks (Jaeger et al. 2010). Thus it is debated as to whether differentials in labour market outcomes between migrants and stayers are a reflection of differences between these groups in individual attributes, or in the remuneration of those attributes or unmeasurable skills (Pekkala and Tervo 2002; UN 2009).

Contributing to this debate, we decomposed differences in wage distributions between non-metropolitan migrants and stayers by applying an extension of the Oaxaca-Blinder decomposition approach (Blinder 1973; Oaxaca 1973) to quantile regressions, as proposed by Mata and Machado (2005). We followed the counterfactual approach based on quantile regression proposed by Chernozhukov et al. (2013).[3] We decomposed differences at each percentile of the wage distribution into two components: (1) differences in individual attributes (differences in composition); and, (2) in unmeasurable skills (differences in coefficients). In the migration literature, the latter are often traced to differences in unobserved behavioural factors, such as discrimination and risk taking behaviour (Neumark 1988; Ueffing et al. 2015).

In practice, the decomposition analysis involved assuming that the wage distribution F_{ω} of migrants (m) and stayers (s) was a function of a set of individual characteristics (X) and coefficients (β). These coefficients were estimated via quantile regressions - following the approach described above - and were used to decompose differences in the wage distributions of migrants and stayers at age 25, as follows:

$$\begin{aligned} F(\omega_m) - F(\omega_s) &= F(\omega(X_m\beta_m)) - F(\omega(X_s\beta_s)) \\ &= \left[F(\omega(X_m\beta_m)) - F(\omega(X_s\beta_m))\right] + \left[F(\omega(X_s\beta_m)) - F\omega((X_s\beta_s))\right] \end{aligned} \qquad (1)$$

The first term on the right-hand side of equation (1) accounts for wage differences in the compositional characteristics (X) between migrants and stayers. It estimates the expected wage differential between migrants and stayers by assuming that migrants possess the same compositional distribution as stayers. The second term accounts for wage differences in coefficients or unobserved behavioural factors (β) between migrants and stayers. It estimates the expected wage differences between migrants and stayers by assuming that stayers possess the same behavioural responses as migrants. This methodology also provides estimates of the individual contribution of explanatory variables and associated coefficients (Chernozhukov et al. 2013). However, given that our focus is concerned with determining the main source of selectivity that underpins wage differences between migrants and stayers we concentrate on overall differences in their composition and associated coefficients.

[3] The decomposition of the quantile differences was performed by using a user-written Stata command, cdeco, available at: http://www.econ.brown.edu/fac/Blaise_Melly/code_counter.html

5. Results and discussion

The current research examines the wage outcomes of non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers to determine if migration from non-metropolitan to metropolitan areas during the school-to-work transition leads to higher wages. We examine the association between particular types of pathways and wage outcomes, and assess the relative significance of individual demographic characteristics and unobservable attributes (e.g. motivation) in explaining the wage differentials between non-metropolitan migrants and stayers.

5.1. Wage returns to migration

Figure 1 shows the hourly wage distribution of non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers at the age of 25. Table 2 reports summary measures of these distributions. Compared to non-metropolitan stayers, the wage distribution of non-metropolitan migrants shows greater density among the lowest percentiles (i.e. 5 and 10), significantly lower density in mid-low percentiles (i.e. 15 to 32) and higher density between percentiles 38 and 58. These differences underline a wage advantage for non-metropolitan migrants, earning a mean wage 24 per cent higher than non-metropolitan stayers; that is, an annual salary differential of over $11,000. While this salary differential becomes smaller ($2,800) when the median of the distribution is considered, the wage gap between non-metropolitan migrants and stayers remains statistically significant. Compared to metropolitan stayers, the wage distribution of non-metropolitan migrants reveals lower density amongst the lowest and mid-low percentiles. Although differences at the mean of the wage distribution between non-metropolitan migrants and metropolitan stayers are significant, wage differentials at the median and among higher earners appear statistically insignificant.

[Figure 1. Hourly wage distribution at the age of 25: non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers.]

[Table 2. Mean and median wage differentials at the age of 25: non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers. Note: * Significance level 10%.]

These results suggest that young people migrating to metropolitan areas after leaving school are better off than those staying in non-metropolitan communities, and realise wage outcomes similar to metropolitan locals. This is in line with studies conducted in the United States that suggest migration from non-metropolitan areas during the school-to-work transition leads to higher wages (Wheeler, 2006; Yankow, 2006). Previous research found that migrants wages remained lower than metropolitan locals (despite wage increases), but this was not the case in the current study. Our findings indicate that non-metropolitan migrants collect the full wage premium in metropolitan areas. Differences in results are likely a function of the point at which the wage differentials are observed. The US studies examined wage outcomes in the year after migration, while we focussed on the long-term effects of migration on wages at the age of 25 when many young people have fully transitioned into full-time employment.

To examine changes in salary outcomes before and after a migration, we analysed the evolution of median hourly wages among non-metropolitan migrants relative to the year of migration (Figure

2)[4]. The results show a 50 per cent drop in the median wage of non-metropolitan migrants in the year of migration, with a steady increase between years 1 and 3 after migration when the median wage reaches the pre-migration median wage. After year 3, the median wage shows a significant increase, peaking in year 9 post-migration with a median wage 44 per cent higher than at one year prior to migration. This evidence thus indicates that after experiencing a considerable wage loss in the first year post migration, non-metropolitan youth collect significant wage growth as they settle in metropolitan locations.

[Figure 2. Evolution of median hourly wage rate for non-metropolitan migrants.]

5.2. School-to-work pathways shaping wage returns

As noted previously, a key explanation for the wage gains experienced by non-metropolitan migrants in metropolitan areas is a rise in individual productivity due to an acceleration of their rate of human capital accumulation (Glaeser 1999; Wheeler 2006). To study the mechanisms underpinning this process, we examined the educational and employment pathways followed by young people in their transition from school to work. However, the complexity and diversity of individual pathways makes identification of distinctive trajectories during this transition difficult. As described in Section 4 we classified individual sequences of school-to-work transitions into a small number of representative sequences by applying OM and the medoids clustering algorithm.

Figure 3 shows these clusters in separate plots with their associated wage outcome. Each horizontal line in the plots represents the school-to-work transition of an individual, with colours indicating their educational or employment status at each age. Purple lines at age 15 indicate that all young people were at school at this age and reflect the fact that they entered the LSAY at around the same age. The plots effectively illustrate the complexity and diversity of school-to-work transition sequences but also reveal their distinctive features.

[Figure 3. Representative types of school-to-work pathways in Australia]

The first cluster, termed *classical*, comprises the largest number of young people in the sample (35.7 per cent of the sample). This cluster is characteristic of the typical sequence of post-school transitions; school to university and then into full-time work. The annual median salary at age 25 for individuals in this cluster is over $58,000. The second cluster comprises one quarter of individuals in our sample, and is dominated by *express* sequences comprising a transition into full-time employment immediately after school between the ages of 17 to 19. The median salary at age 25 years of individuals in the express cluster is 15 per cent lower than those in cluster 1 (the

[4] It is important to note that our data comprise nominal wages. This wage growth may thus reflect differences in living costs between metropolitan and non-metropolitan areas, rather than a real increase in wages. Lack of spatial data on living cost covering the Australian territory prevents exploring changes in real wages. However a 2006 study by Australia's Bureau of Infrastructure, Transport and Regional Economics (BITRE 2008) indicate that while major cities tend to have higher living costs than regional cities and towns, living costs are much higher in remote areas and coastal towns. Although these spatial relativities may have changed, the evidence suggests that the rise in median wage experienced by non-metropolitan migrants cannot be entirely explained by living cost differentials. This is particularly for those moving from non-metropolitan areas such as Broome, Moyne and Nhulunbuy which display living costs of up to 30 per cent higher than major cities (BITRE 2008).

classical pathway). The third cluster is termed *unstable* because it is characterised by individual sequences comprising a transition from school into part-time work, with intervening periods of unemployment and inactivity. This is the smallest cluster and individuals in this group have the lowest median annual salary.

The fourth cluster is termed *bridge.* Trajectories in this cluster are typified by transitions from school to vocational education and then into full-time work. This cluster reports the second highest median salary of the five clusters, equivalent to 94 per cent of that earned by individuals who experienced a classical type of pathway. The fifth and final cluster is labelled *extended education* and is dominated by sequences comprising a transition from school into a prolonged period of university education. While this extended period in education may be argued to mirror the low academic performance of struggling students, in our sample this is more a reflection of an extension of university education in pursuit of a postgraduate qualification. At the age of 25, most students in this cluster (88%) already held a bachelor degree or vocational qualification and were enrolled in an educational institution. The majority (76%) also juggled this period of education with part-time jobs, reporting a median salary 18 per cent lower than that of individuals who experienced a classical pathway at the age of 25. Overall, the picture that emerges from Figure 3 is that young people embarking on a sequence of school-to-work transitions that deviate from the classical pathway report lower salaries at age 25 years.

To identify interactions between migration and pathways from school to work, we compared the typical transitions of the general youth population to the pathways followed by non-metropolitan migrants. Table 3 reveals that non-metropolitan migrants followed distinctive pathways. The majority (64 per cent) transitioned through a classical or express pathway. They appear more likely to follow a classical or extended education pathway and less likely to transition through an unstable or bridge pathway than those staying in non-metropolitan communities. In contrast to those remaining in metropolitan areas, they are less likely to embark on a classical or extended education pathway and more likely to make an express transition into the labour market or experience an unstable school-to-work pathway. Thus, while migration during the school-to-work transition appears to facilitate non-metropolitan youths' pathways to university education and full-time employment, it also seems to comprise a difficult labour market transition for a minority of non-metropolitan migrants, involving spells of unemployment and part-time work.

[Table 3. Percentage and odd ratio by school-to-work pathway. Note: * Significant level 10%.]

Next we investigate the extent to which school-to-work pathways influence the wage outcomes of non-metropolitan migrants, non-metropolitan stayers and metropolitan stayers at age 25. Separate regressions were estimated for each of these groups using median quantile regressions to account for the skewness of the wage distribution. We controlled for the range of family, geographical and personal variables shown in Table 1. The full set of estimates is reported in the Appendix. While we focus on the influence of school-to-work pathways on wages, we also discuss coefficients associated with the effects of migration, residential area size and parental education in Figure 4.

Analysing the effects of migration, the coefficient for the linear term of the number of years spent in metropolitan areas indicates that for every year young people from non-metropolitan areas reside in metropolitan areas their wages increase by $3.80. Although insignificant, the negative coefficient for the quadratic estimate suggests that after 5.2 years the salary returns to migration atrophy.

Additionally, the positive coefficient for making a return move to non-metropolitan areas suggests that the salary gains accumulated by non-metropolitan youth after migrating to a metropolitan area stay with them after they return to a non-metropolitan community. These findings are consistent with prior work (Glaeser and Maré 2001; Yankow 2006), and suggest that migration from non-metropolitan areas during the school-to-work transition lead to higher salary returns in early working life.

The results also show the urban hierarchy effects on the wages of young people. Consistent with the US-based evidence (Wheeler 2006), our results show that non-metropolitan Australian youth migrating to larger metropolitan areas tend to report hourly wages about $3 higher than those moving into small metropolitan localities. In contrast to existing evidence (Wheeler 2006), however, our results indicate that young people staying in large non-metropolitan areas tend to earn lower wages than those in smaller locations. This pattern is likely owing to high paying mining jobs in remote Australia (BITRE 2008). Among metropolitan stayers, residential area size was not associated with wages. Thus, the nature of being urban is what seems to drive wage outcomes as suggested by higher median wages for stayers and migrants in metropolitan areas compared to those remaining in non-metropolitan locations (Figure 1).

Focusing on the influence of school-to-work pathways, the results for non-metropolitan migrants show that transitioning through an express or a bridge pathway generates no significant wage differentials at age 25, compared to transitioning through the classical pathway. However, experiencing an unstable or an extended education pathway leads to lower wages. Non-metropolitan migrants experiencing an unstable or an extended education pathway tend to report hourly wages $9 or $7 dollars lower than those moving through a classical school-to-work transition. Coefficients associated with these pathways are larger for non-metropolitan migrants than for stayers. This indicates that experiencing an unstable or extended education pathway has a greater impact on the wage outcomes of non-metropolitan migrants, leading to lower earnings than those of people staying in non-metropolitan areas or metropolitan locations.

Taken together, the findings suggest that deviation from the classical school-to-work pathway (i.e. from school into university and then into full-time work) increases the likelihood of lower wage returns in early working life, particularly if young people migrate from non-metropolitan areas and experience an unstable or extended education transition after leaving school. However, it is important to note that young people migrating from non-metropolitan areas display a low probability of experiencing these pathways (Table 3). Rather, they are more likely to progress through classical or express pathways into the labour market which lead to higher salary returns. Further, low wages for young people transitioning through an extended education pathway are a reflection of their dual status in education and part-time work. Their wage outcomes are likely to improve as they complete their degrees and move into full-time jobs. What is more concerning, however, from a policy perspective is the group of young people who experience unstable pathways as past spells of youth unemployment and low salaries are indicative of future unemployment experiences and low paying jobs (Bell and Blanchflower 2011; Oreopoulos et al. 2012).

The results displayed in Figure 4 [5] suggest that the pathway that young people follow during their transition from school to work has a stronger impact on their wage outcomes than their parents' level of education. This effect is particularly pronounced for non-metropolitan migrants and may suggest that countries with less standardised, more flexible education systems offer greater opportunities for career mobility (Raffe 2011). Thus, what young people do during their school-to-work transition can have a more significant impact on shaping their professional careers than their family socio-economic circumstances. However, it is important to recognise that this does not mean that family traits play no role in building a young person's future. In fact, there is mounting evidence of the importance of intergenerational transmission of human capital from parents for improving children's health and educational outcomes (Currie and Moretti 2003; Oreopoulos et al. 2006).

While the type of school-to-work pathways that young people follow is important in shaping their wage outcomes, the industry sector in which they work appears to have a greater influence. Coefficients for the top paying industry of employment were greater than those associated with school-to-work pathways for all three groups of young people, particularly for non-metropolitan migrants (see Appendix A). These results indicate that individuals working in the mining and utilities sector report higher wages than those working in other industries, such as manufacturing, information media and telecommunications (ABS 2014).[6]

5.3. Explaining wage differentials between migrants and stayers

To further explain the wage differentials between non-metropolitan migrants and stayers, wage differentials were decomposed into differences in individual covariates (differences in composition) and differences in regression coefficients (differences in unmeasurable attributes). The results are summarised in Figure 5 and Table 4. Figure 5 plots the differences in wage density between migrants and stayers in the first vertical panel, and the effect of differences in composition and unmeasurable attributes in the next two panels. Table 4 provides detailed information of the decomposition results at the 25th, 50th and 75th percentiles. The first two columns of this table show the marginal wage distributions for non-metropolitan migrants and non-metropolitan stayers in the top panel, and between the former and metropolitan stayers in the bottom panel. The third column reports the estimated wage gap between non-metropolitan migrants and each group of stayers, and 90 percent confidence intervals using bootstrapping standard errors. The next two columns show the decomposition of the total wage gap into differences in characteristics and differences in coefficients, with the last line in each cell reporting the percentage of wage gap explained by each factor. The estimated contributions were only significant for differences in coefficients between non-metropolitan migrants and non-metropolitan stayers at around the 25th percentile. Differences in characteristics and coefficients at other points of the wage distribution were insignificant reflecting the small wage differentials at higher percentiles and between non-metropolitan migrants and metropolitan stayers.

[5] Coefficients for the employment occupation of parents produced similar results, but they were excluded because of collinearity with parental education variables.

[6] The industry in which individuals work may consider to be an endogenous choice -as salary expectations may influence the decision to work in a particular industry. However, endogeneity does not seem to be a concern in our analysis. We perform regressions robust to endogeneity by using 2012 industry sector data (i.e. the preceding year to which wages are measured). They show little changes in relation to those reported in Appendix A.

[Figure 5. Quantile regression decomposition of salary differentials]
[Table 4. Decomposition of differentials in wage distribution.
Note: The first entry in each cell is the point estimate. The second entry is the 90% bootstrap confidence interval. The third entry is the percentage of the total difference explained by each factor.]

The first vertical panel in Figure 5 shows the wage density of non-metropolitan migrants has a lower mass in the left tail and a greater mass in the right tail, particularly more pronounced when compared to non-metropolitan stayers. This indicates that at lower quantiles non-metropolitan migrants earned less than the two groups of stayers, but higher salaries at higher quantiles, resulting in a higher average and median wage (Table 4).

Decomposing these wage differences into differences in characteristics and coefficients reveals that these factors exert counterbalancing effects. While differences in characteristics work to mitigate the observed differentials across the wage distribution between non-metropolitan migrants and the two groups of stayers, differences in coefficients contribute to widening of wage differentials. Rather than differences in composition (i.e. observable factors), the results show that these differences in coefficients (i.e. unobservable factors) are the main factor shaping the wage differentials between non-metropolitan migrants, and non-metropolitan and metropolitan stayers. These results suggest that the migration selectivity of young people with particular unobservable attributes, such as motivation and aspirations is the key determinant that shapes the wage differentials between non-metropolitan migrants, and non-metropolitan and metropolitan stayers. For instance, Table 4 reveals that differences in coefficients at the 75th percentile would have contributed to widen the observed wage gap of $2 dollars between non-metropolitan migrants and non-metropolitan stayers by an additional $1.90, in the absence of counteracting compositional effects. These results are consistent with the idea that non-metropolitan youth migrating to metropolitan areas may be more motivated and driven than both stayers at the origin and the destination to develop their professional career and embark on career pathways to improve their salary outcomes (Rowe et al. 2014b).

6. Conclusion

School to workforce transitions comprise a critical phase of an individual's life particularly as it relates to human capital development. Transitional pathways experienced during this time significantly influence lifelong career trajectory and long term earning capacity (Lamb, 2001). There is a tendency for young individuals from non-metropolitan communities to relocate to urban centres during this period in order to access post-school education and employment opportunities not available in their local area. The out-migration of young people from non-metropolitan areas has been documented across the industrialised world and non-metropolitan communities are faced with the challenge of enticing young people to return to their origin communities in order to ensure the future economic development of these areas. Yet, empirically little is known about the complex interplay between migration, school to work transitions and individual wage outcomes. As non-metropolitan communities seek to curtail net migration loss of young people a better understanding of the diverse pathways individuals follow post-schooling, the relationship between such pathways and migration and future wages, is needed to provide an evidence base to inform policies that can entice individuals to return to their community of origin after a period of human capital accumulation facilitated through urban living. This paper examined the effect of the interaction

between migration and school-to-work pathways on wage outcomes of non-metropolitan Australian youth in their early working life.

Our results revealed that migration from non-metropolitan areas during the school-to-work transition leads to higher entry-level wages in metropolitan locations. Non-metropolitan migrants achieved a mean wage 24 per cent higher than was earned by non-metropolitan stayers; and in contrast to prior work (Wheeler 2006; Yankow 2006), they appear to collect the full wage premium in metropolitan areas, reporting similar salaries to metropolitan locals. Salary returns after migration are, however, not immediate. Rather, wages start increasing after a significant wage loss in the year of migration, exceeding pre-migration wage levels in the third year post-migration and peaking in the ninth year post-migration.

We showed that the career pathway followed by non-metropolitan youth migrating to metropolitan areas during their school-to-work transition is a key factor underpinning these wage gains. Non-metropolitan migrants are more likely to experience a classical (i.e. from school into university and full-time work) or express (from school into full-time work) school-to-work pathway than those staying behind. These pathways lead to high salary returns. Deviation from these pathways results in lower wage outcomes. Compared to metropolitan stayers, young people migrating from non-metropolitan areas who experienced an unstable pathway or an extended education pathway, achieved significantly lower salaries in early working life, than those who progressed through a classical school-to-work pathway. Low wages associated with transitioning through an extended education pathway reflect the dual status of young people in higher education and part-time work, and have the potential to improve as they complete their qualifications and enter full-time work. An unstable pathway, on the other hand, reflects a difficult transition from school into part-time work, with intervening periods of unemployment and inactivity. The group of non-metropolitan migrants transitioning through this pathway is, however, small. Taken together, the findings are consistent with literature in labour economics (Glaeser and Maré 2001), indicating that non-metropolitan youth experience wage gains in metropolitan areas; and reveal that this outcome is a result of individuals embarking on school-to-work transition pathways that enhance their human capital. The results highlight that migration does not in itself lead to higher wages but enables young people from non-metropolitan areas to take up opportunities not locally available.

Our results contribute to the debate (Pekkala and Tervo 2002; UN 2009) on whether differences in observed or unobserved attributes drive labour market differentials between migrants and stayers. The evidence revealed that differences in unobserved attributes are the main factor explaining the higher wages achieved by non-metropolitan migrants in early working life, compared to non-metropolitan and metropolitan stayers. This result is consistent with the notion that migrants are a select group of individuals who tend to be more motivated and determined to enhance their human capital and labour market outcomes than stayers (UN 2009).

We note that our analysis reflects the wage differentials between non-metropolitan migrants and those staying in non-metropolitan and metropolitan locations at an early point in their career trajectory, thus outcomes may change as young people gain working experience and move up the occupational hierarchy. While investigation of long-term wage trajectories is beyond the capacity of the data at hand this is an important area for future research. Such a study has the potential to extend our understanding of the long-term effects of migration on the wages and employment outcomes of non-metropolitan people moving to metropolitan locations.

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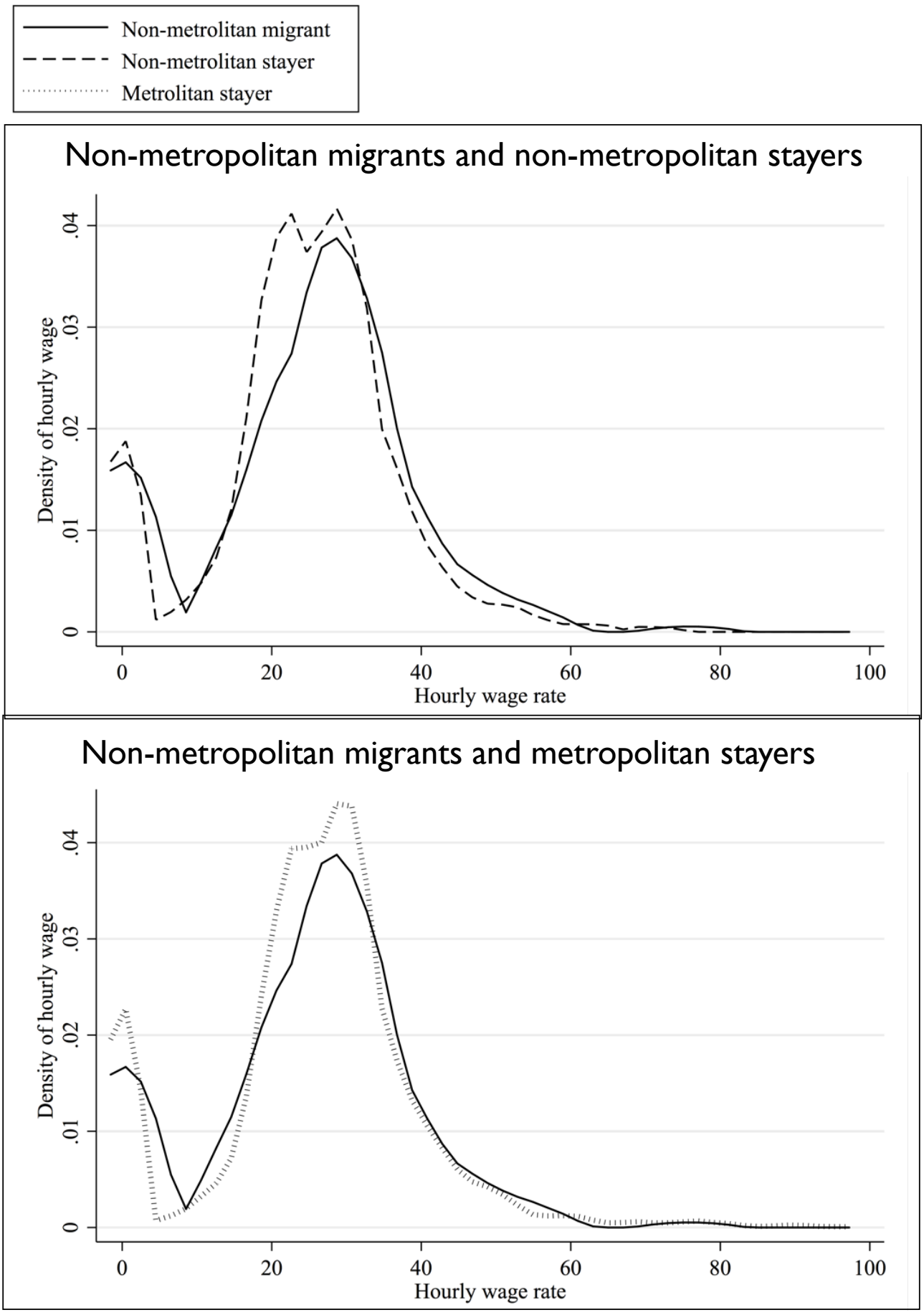

Figure 1. Hourly wage density at the age of 25.

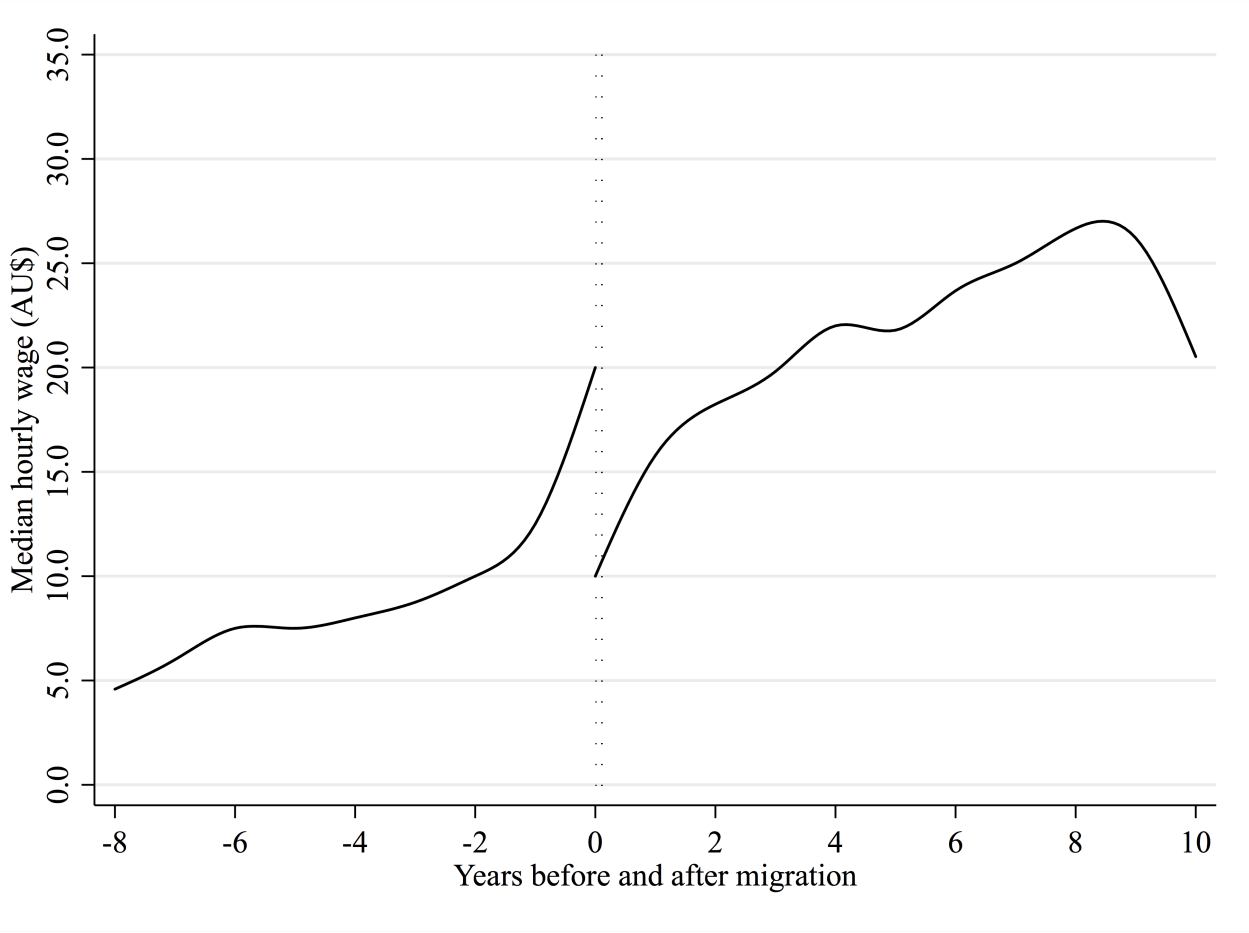

Figure 2. Evolution of median hourly wage rate for non-metropolitan migrants.

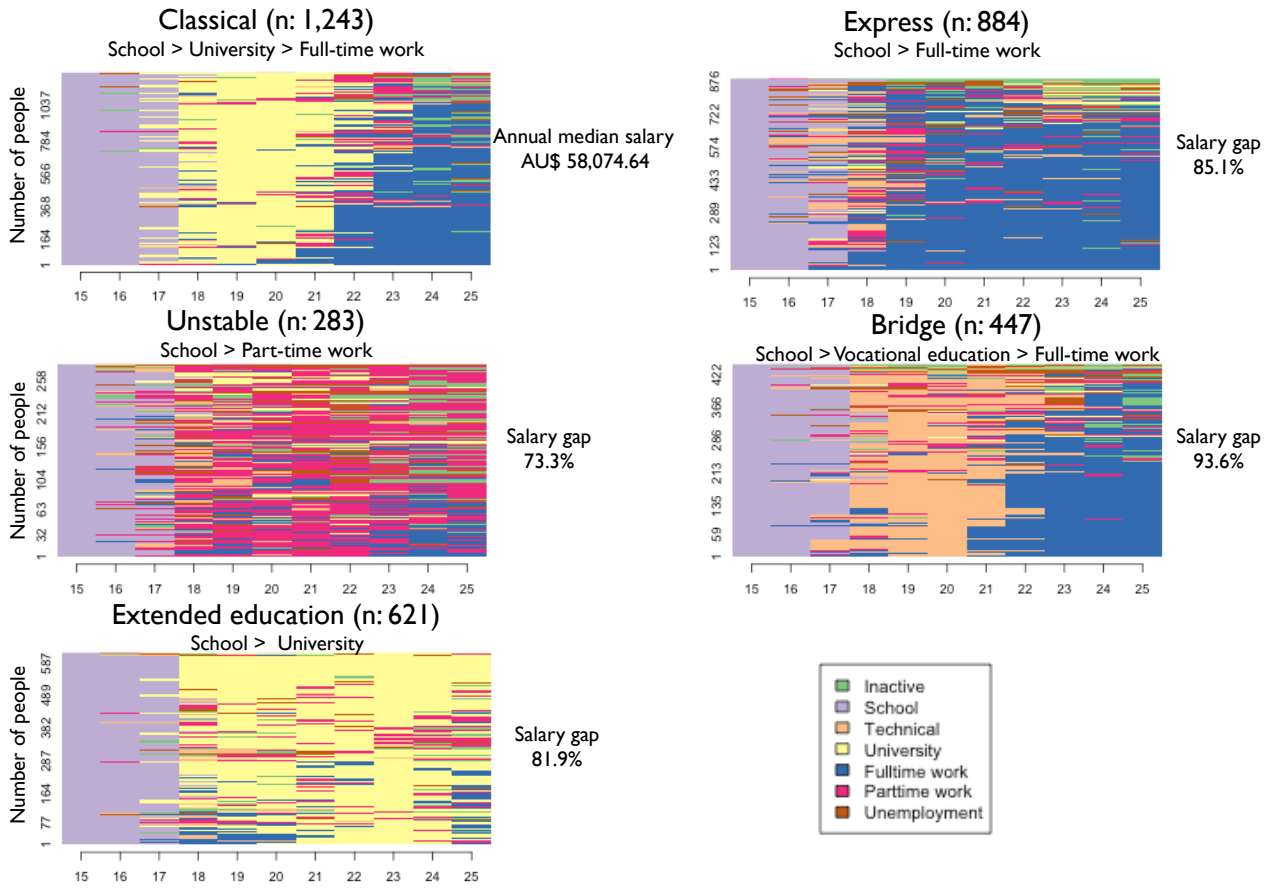

Figure 3. Representative school-to-work pathways and associated salary outcomes.

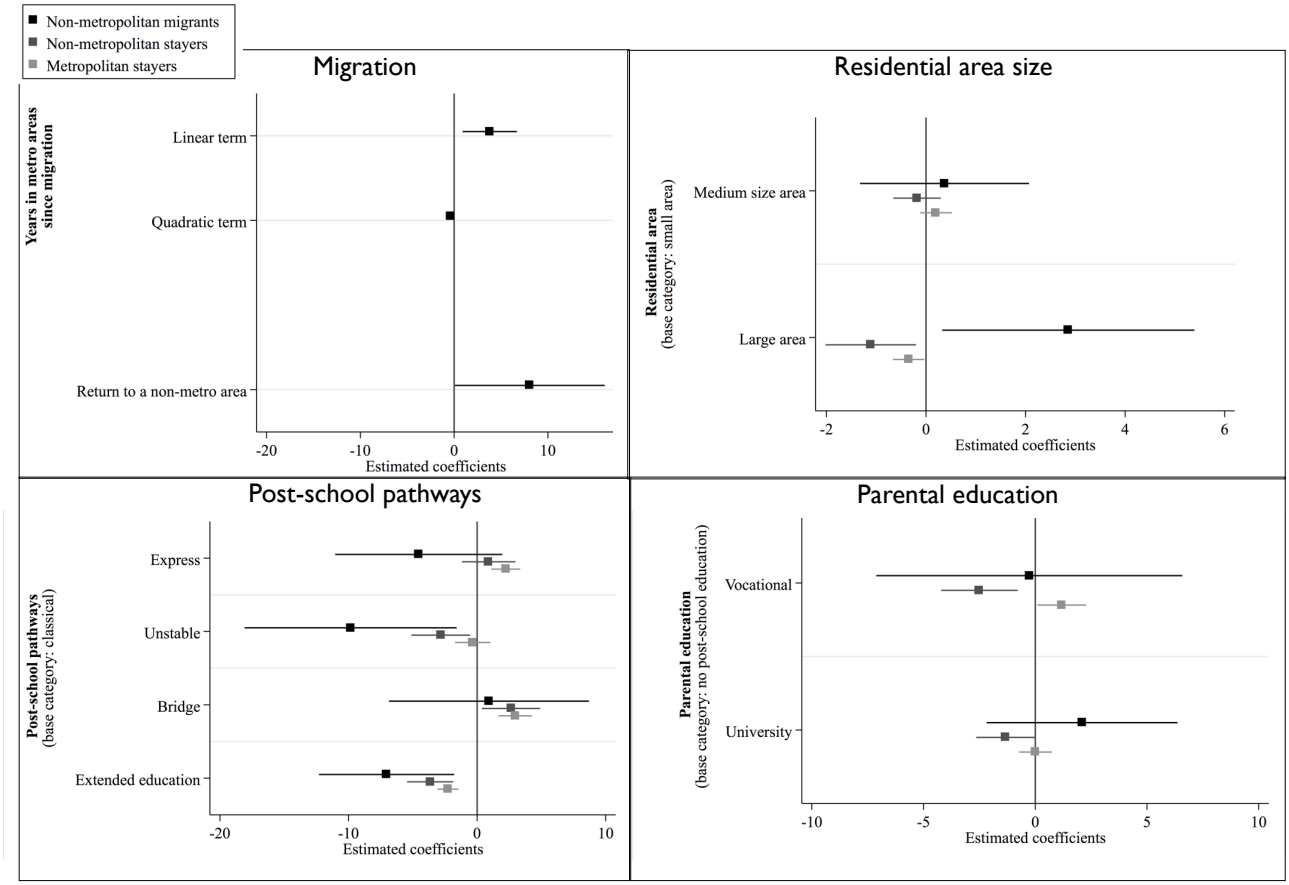

Figure 4. Quantile median regression coefficients and 90% confidence intervals.
Note: See Table 1 for the full set of variables included in model specification. Appendix A reports the estimated coefficients for the full model specification. Confidence intervals are based on bootstrap standard errors, using 400 replicates, which is considered an appropriate number to obtain good estimates (Efron and Tibshirani 1993).

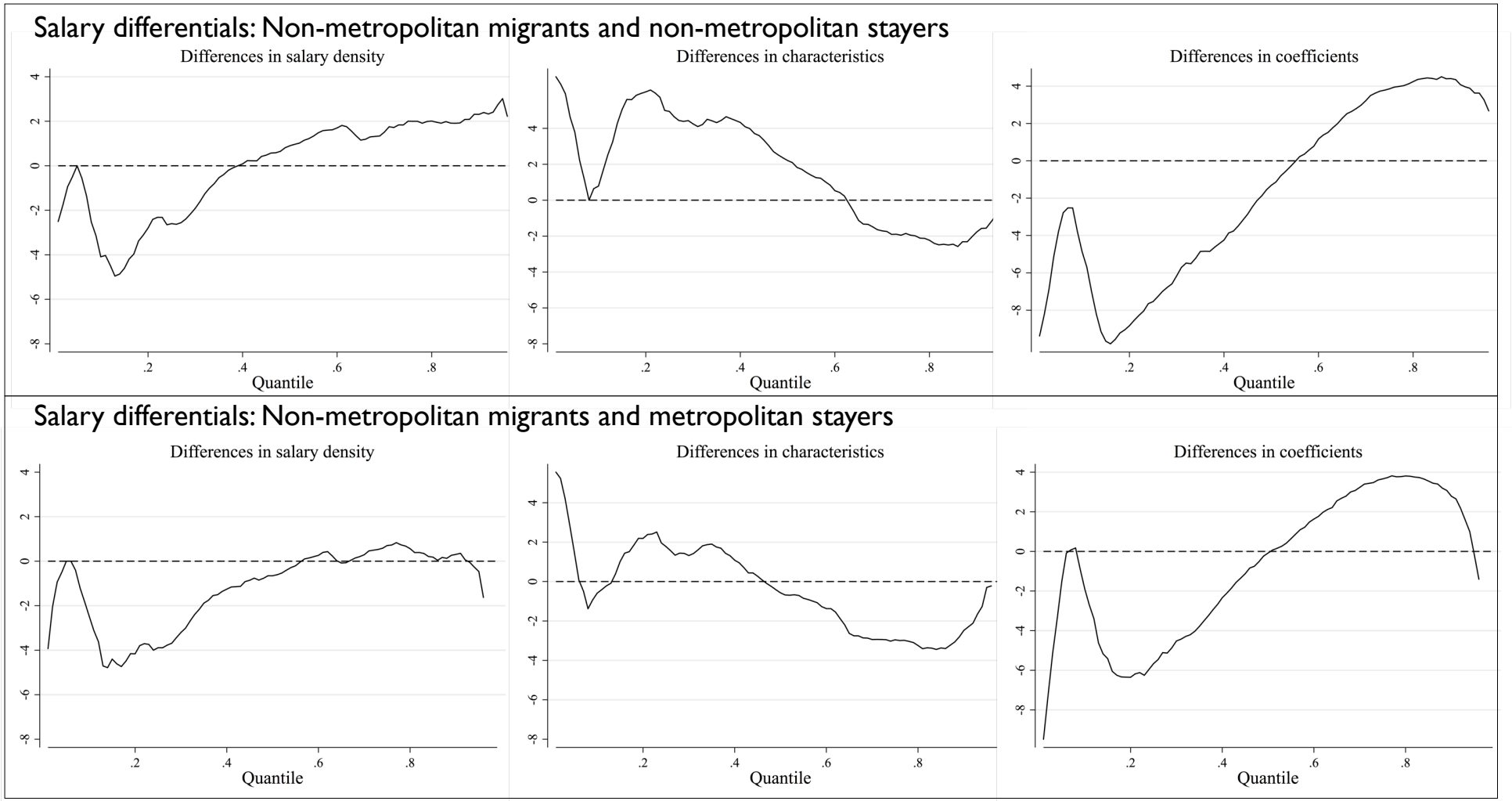

Figure 5. Quantile regression decomposition of salary differentials.

Table 1. Independent variables for the quantile regression analysis.

Variables	**Definition**
Male	1 if male
Indigenous status	1 if Aboriginal or Torres Strait Islander origin
Parental highest educational qualification	
No post-school qualification	1 if neither of an individual's parents completed a post-school qualification
Vocational	1 if at least one of obtained an individual's parents had a vocational qualification
University	1 if at least one of obtained an individual's parents had a unversity qualification
School-to-work pathway	
Classical	1 if experienced through a troubled pathway type during the transition from school to work -further explanation in text
Express	1 if experienced through a express pathway type during the transition from school to work -further explanation in text
Unstable	1 if experienced through a unstable pathway type during the transition from school to work -further explanation in text
Bridge	1 if experienced through a bridge pathway type during the transition from school to work -further explanation in text
Extended education	1 if experienced through a extended education pathway type during the transition from school to work -further explanation in text
Educational attainment	
No post-school qualification	1 if had no post-school qualification by the age of 25
Vocational	1 if obtained a vocational qualification by the age of 25
University	1 if obtained a university qualification by the age of 25
Top/lower ranked paying fields of study	
Low rank paying study fields	1 if an individual obtained a degree in one of the low paying study fields in Australia i.e. Art and Design and Pharmacy (GCA 2014)
Top rank paying study fields	1 if an individual obtained a degree in one of the top paying study fields in Australia i.e. Engineering, Medicine, Dentistry and Optometry (GCA 2014)
Other study fields	1 if an individual obtained a degree in any study fields not included in the above two categories.
Occupations	
Elementary	1 worked in an elementary occupation
Technical or manual	1 worked in a technical or manual occupation
Professional or managerial	1 worked in a professional or managerial occupation
Top/lower paying industry	
Low paying industry	1 if an individual was working in Retail Trade, Accommodation and Food Services, the lowest paying industry sectors in Australia (ABS 2014)

Top paying industry	1 if an individual was working in Utilities and Mining, the highest paying industry sectors in Australia (ABS 2014)
Other industries	1 if an individual was working in an industry sector other than those included in the two above categories.
Number of years in metropolitan areas after migration	
Linear term	Number of years in metropolitan areas after migration at the age of 25
Quadratic term	Squared of the linear term above.
Return to a non-metropolitan area	1 if the place of residence is in a non-metropolitan area after having spent at least one year in a metropolitan location.
Population size of statistical local area of residence	
Small	1 if the place of residence was within the first quantile of the population distribution; that is, a population size smaller than 224,000. The population size of the Australian Bureau of Statistics' Statistical Area 4 was used.
Medium	1 if the place of residence was within the second quantile of the population distribution; that is, between 224,000 and 357,000 inhabitants.
Large	1 if the place of residence was within the third quantile of the population distribution; that is, over 357,000 inhabitants.

Table 2. Mean and median wage differentials at the age of 25.

	Hourly salary rate, age 25			Differential[1]			
	Mean	Median	SD	Mean		Median	
Non-metropolitan migrant	30.5	26.4	14.0	0.00		0.00	
Non-metropolitan stayer	24.5	25.0	13.1	11,816.48	*	2,845.44	*
Metropolitan stayer	26.3	26.3	17.4	8,259.68	*	237.12	

1 Non-metropolitan migrants minus a benchmark group (i.e. Non-metropolitan stayers or metropolitan stayers). * Significance level 10%.

Table 3. Percentage and odd ratio by school-to-work pathway.

School-to-work pathway	Non-metropolitan migrants	Non-metropolitan stayers	Metropolitan stayers
Per cent			
Classical	33.0	29.2	37.3
Express	30.8	29.7	23.2
Unstable	9.7	11.0	7.4
Bridge	12.4	17.8	11.8
Extended education	14.1	12.4	20.3
Odds ratio			
Classical	1.00	1.13*	0.88*
Express	1.00	1.04	1.33*
Unstable	1.00	0.89*	1.31*
Bridge	1.00	0.70*	1.06
Extended education	1.00	1.14*	0.69*

Note: * Significance level 10%.

Table 4. Decomposition of differentials in wage distribution.

	Marginals			Aggregate contributions	
Quantile	Non-metropolitan migrant	Non-metropolitan stayer	Wage gap	Characteristics	Coefficients
25	15.5	18.1	-2.6	4.9	-7.5
			-4.235; -0.964	-0.775; 10.656	-14.287; -0.793
				-190.0	290.0
Median	26.1	25.2	0.9	2.2	-1.3
			-0.254; 2.051	-2.590; 7.009	-6.930; 4.309
				245.8	-145.8
75	33.3	31.3	2.0	-1.9	3.9
			0.664; 3.341	-5.870; 2.164	-0.711; 8.423
				-92.5	192.5
Quantile	Non-metropolitan migrant	Metropolitan stayer	Wage gap	Characteristics	Coefficients
25	15.5	19.4	-3.9	1.8	-5.7
			-5.456; -2.323	-4.229; 7.782	-11.832; 0.499
				-45.7	145.7
Median	26.1	26.7	-0.7	2.2	-1.3
			-1.652; 0.341	-2.590; 7.009	-6.930; 4.309
				-337.1	199.9
75	33.3	32.6	0.7	-1.9	3.9
			-0.47; 1.877	-5.870; 2.164	-0.711; 8.423
				-263.7	548.7

Note: The first entry in each cell is the point estimate. The second entry is the 90% bootstrap confidence interval. The third entry is the percentage of the total difference explained by each factor.

Appendix A. Quantile median regression coefficients.

Variables (base category)		Non-metropolitan migrant		Non-metropolitan stayer		Metropolitan stayer	
Male		3.640	**	3.890	***	1.349	***
Indigenous status		8.917	**	0.453		-2.300	
Parental highest educational qualification (No post-school qualification)							
	Vocational	-0.267		-2.500	*	1.184	
	University	2.094		-1.320		0.014	
School-to-work pathway (Classical)							
	Express	-4.543		0.900		2.231	**
	Unstable	-9.837	***	-2.827		-0.344	
	Bridge	0.930		2.640		2.959	**
	Extended education	-7.042	***	-3.650	**	-2.266	***
Educational attainment (No post-school education)							
	Vocational	5.440	*	2.473	*	0.500	
	University	7.217	*	6.580	***	2.546	**
Top/lower ranked paying fields of study (Average paying study fields)							
	Lower rank	-4.066		-7.023	**	-0.687	
	Top rank	0.427		0.760		1.386	
Occupations	High skill occupation	5.191	**	4.743	***	6.114	***
Top/lower paying industry (average paying industries)							
	Top paying industry	17.161	***	7.539	**	7.117	***
	Low paying industry	0.239		-0.607		-2.027	*
Years in metro areas after migration							
	Linear term	3.800	*				
	Quadratic term	-0.363					
Return to a non-metro area		2.858					
Population size of statistical local area of residence (Small)							
	Medium	0.370		-0.180		0.200	

	Large	2.858	*	-1.110	*	-0.349	
	Constant	9.522	***	18.677	***	21.206	***
	Pseudo R2	0.184		0.111		0.075	
	No. observations	184		720		2209	

Note: * Significance level 5%, ** 1% and ***0.1%. Confidence intervals are based on bootstrap standard errors, using 400 replicates.