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Migration and labour market outcomes by skill in Australia

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1. Introduction

Orthodox theory posits that labour mobility is the fluid that allows labour market to operate efficiently. It is claimed that regional employment growth disparities which create pockets of unemployment are resolved by the improved job matching that migration engenders. However, mobility can only play this role if barriers to migration are low and inter-regional migration (and commuting patterns) reflect changing spatial labour market conditions. If mobility is constrained then 'negative shocks can have prolonged effects, and the economy's growth potential might be impeded' (Lawson and Dwyer, 2002: 1).

Recent research from the UK suggests that, at least within cities, few barriers to labour market adjustment exist at the small area level (Gordon, 2003). Interactions between labour markets are strongest between proximate or neighbouring regions (Mitchell and Bill, 2006; Bill, Mitchell and Watts, 2006 for empirical application to Australia) and adjustments to disequilibria travel across sub-markets relatively quickly. Such adjustments occur through commuting and migration; and the majority of migration is through small moves between neighbouring regions.

Despite these adjustments, the Australian labour market does not appear operate in the way described by neoclassical theory (see Bill and Mitchell, 2006). While labour supply does respond to market signals it does so in an incomplete and lagged fashion which results in persistent pockets of high unemployment in areas of low demand. Migration is also likely to be more significant when the economy is booming than during times of slack. Neoclassical theory ignores this asymmetry.

Further, over the last decade, employment opportunities in Australia have been spatially concentrated (Mitchell and Carlson, 2005; Mitchell and Bill, 2006; Bill and Mitchell, 2006) and regions exhibiting strong employment growth have also experienced strong labour force growth (Mitchell and Bill, 2006). Low-skilled workers, in particular, do not benefit from this growth. They are disadvantaged by the influx of more skilled workers (via migration or changing commuting patterns) who are prepared to take low-skill jobs – the so-called "bumping effect". The overall problem is a lack of overall jobs.

This result is confirmed in recent analysis of the Greater Sydney Metropolitan Region (Mitchell and Watts, 2008; Bill, Mitchell and Watts, 2006) which shows that commuting, followed by migration, were the main labour market adjustment mechanisms for both men and women over the last decade or more. Thus considerable leakages exist in local employment creation which means that unemployment is slow to fall in high growth areas. This mobility is particularly detrimental to low-skilled workers in high growth areas.

Gordon (2003) suggests that it is the unevenness in the distribution of employment opportunities which is likely to be the key motivating factor, rather than differentials in the rewards and risks of the destination region, although this remains contested.

The Australian Industry Commission (1993) argued that a large proportion of labour market adjustment to shocks occurred via changing labour force participation rates, with migration playing only a minor role.

At the state level, labour mobility has been found to reduce interstate unemployment rate differentials (Borland and Suen, 1990; Debelle and Vickery, 1998). Research at the sub-state level shows in-migration favours regions with high employment growth

which also have high unemployment rates, due to rapid labour force growth (see Lawson and Dwyer, 2002; McGuire, 2001 and Trendle, 2004). Conversely, out-migration from low employment growth regions slows labour force growth and keeps unemployment lower than otherwise.

In summary, while workers are mobile in Australia:

- Labour force flows do not provide complete adjustment, as evidenced by the persistence of regional unemployment rate differentials;
- Such flows (in-commuting and in-migration) to high growth areas disadvantage low-skill workers who cannot compete against higher skill workers coming from less advantaged regions; and

a) These results also need to be understood in the context of demand-side developments. It is clear that overall employment growth has not been sufficient to generate enough overall jobs (working hours) to satisfy the desires of all the willing workers and this has resulted in the process of regional arbitrage as more able workers migrate to buoyant labour markets.

In this paper, we seek to explore these issues in more detail. We use the six waves of the Survey of Housing Income and Labour Dynamics in Australia (HILDA) survey to provide a detailed description of the characteristics of mobility and the mobile worker in Australia. We are particularly interested in determining whether low-skilled workers are less mobile than other workers. Previous studies indicate that the better educated are more able to meet the costs of moving or the expected returns from migration (see Bill and Mitchell, 2006). Low-skilled workers appear to face greater barriers to migration in the form of lower income levels and constraints arising from the social housing system. If low-skill workers are less mobile then they become more dependent on local employment opportunities and thus more susceptible to unemployment when demand shifts.

We also seek to explore where people move to and from as part of an assessment of the efficiency of labour market flows. Here we are interested in the impacts of the spatial polarisation of housing and associated declining housing affordability on the ability of different skill groups to move in search of better employment opportunities. We show that growing differentials in house prices and incomes within and between regions, have worked to impede the mobility of low-skilled workers, as workers outside of high growth regions simply cannot afford to enter the housing markets of growing regions, particularly in buoyant metropolitan labour markets.

We also employ formal econometric modelling to examine whether migration is beneficial to workers. After controlling for a range of demographic, regional and demand side factors, and accounting for so-called selectivity bias in the migration decisions, we examine the impact of migration on pay outcomes and employment outcomes. Echoing Pekkala and Tervo (2002) we examine whether movers more likely to escape unemployment than residents who stay? That is, is there some causal relationship between migration and re-employment that means that migration can be regarded as a micro-efficient. Similarly do employed movers maintain their employment status in the destination region? We show that the low-skilled are less mobile but mobility is a path to higher pay. We also show that the low-skilled are less likely to maintain employment across any year and are even more disadvantaged if they move.

The paper is laid out as follows. Section 2 describes the data. Section 3 provides preliminary analysis of the characteristics of movers, reasons for moving and rates of transition to employment for unemployed movers and non-movers. In Section 4 we estimate migration equations to isolate factors which motivate the decision to move. We also estimate an outcomes equations following migration where the dependent variables in turn are improvements in pay, employment status and propensity to change occupation. We use bivariate probit techniques to control for self selection. Section 5 concludes.

2. Data description and sources

Two main data sources are used: (a) Custom tables provided by the Australian Bureau of Statistics (ABS) at the Statistical Local Area (SLA) level of geography as defined in 2006. Migration data in custom tables was provided by the ABS from the 2006 Census. A custom matrix of migration flows between all Australian SLAs was acquired for all persons and low-skilled persons (defined as persons who did not complete Year 12 and who have no further formal qualification); and (b) HILDA data Waves 1-6. Aggregate studies of migration cannot adequately control for region and personal characteristics, and tend to suffer from the practice of 'inferring (unknown) employment status prior to, or at the time of, migration from data on employment status available at the end of the migration interval' (Herzog, Schlottmann and Boehm, 1993: 327).

We use HILDA to define the sequence of events so that we can more confidently isolate the impact of employment on migration and mobility outcomes. We constructed a cross-sectional pooled dataset of the working age population from the six waves comprising 42,091 observations (or persons who responded to the full survey). Persons under the age of 15 and full-time students have been deleted from the dataset. Persons who did not state their education qualifications have also been excluded. Low skill for the purposes of the analysis is defined as persons whose highest qualification Year 11 or below. Regional level data has been merged from the 2006 Census of Population and Housing using SLA level spatial identifiers on the unconfidentialised version of HILDA.

House price data, for each state's metropolitan and non-metropolitan region, is drawn from Commonwealth Bank and Housing Institute of Australia's (HIAs) Housing Report, which provides a quarterly review of housing affordability.

3. A descriptive analysis of mobility by skill

3.1 Who are the low-skilled in Australia?

Low-skill workers represent 30 per cent of respondents in the six waves of the HILDA dataset. Table 1 examines the characteristics of low-skilled and other workers. The following summary points are worth noting:

- Low-skilled persons are more likely to unemployed and significantly more likely to be out of the labour force;
- They are more likely to be female, sole parents and have a disability;
- The low-skilled are more likely to be aged between 50-59 years reflecting the growing emphasis in recent decades on gaining formal credentials;

- Low-skill workers are less likely to be in a family with dependents or to have an employed spouse;
- Indigenous persons are more likely to be low-skilled;
- Low-skilled workers are less likely to own their house;
- The neighbourhood social interaction of the low-skilled (measured by such factors as self-reported fairly commonly or very commonly neighbours helping each other out, neighbours doing things together, chatting with neighbours, neighbours talking about current affairs) are slightly higher than other persons.
- Low-skilled persons are, as expected, concentrated in the low-skilled occupations.

3.2 Low-skill and pay

Table 2 shows that low-skill workers (both full- and part-time) earn considerably lower gross pay (prior to deductions) than other workers. All workers, however, enjoy higher wages in metropolitan regions (see Bill, Mitchell and Welters, 2008 for an exploration of this phenomenon).

3.3 Are low-skilled workers less mobile?

Table 3 reports the percentage of respondents (skilled and low-skill) reporting that they had moved between each wave. As the labour market tightened over this period, the percentage moving declined for each skill group. The average percentage of movers for the entire period is 16 per cent for all persons, 16.8 per cent for skilled workers (defined as workers who are not low-skilled), and 14.3 per cent for low-skill workers. While low-skill workers have lower mobility rates than other workers, Australian mobility rates in general exceed the UK figure of 10 per cent for the working age population (Böheim and Taylor, 1999). But they are probability significantly below the mobility rates found in the US which have been estimated to be 2-3 times higher those of the UK (Hughes and McCormick, 1985).

3.4 Why do people move and how far?

Table 4 shows that housing-related moves dominate with over half of respondents who moved, citing this reason (some movers list multiple reasons and therefore appear more than once in the Table). Such reasons included moving to get a smaller or larger place, getting a place of one's own, because the property was no longer available or because of an eviction.

The other dominant motivations were work-related (17 per cent of those who moved) and personal (26 per cent of those who moved). The latter include moving to be closer to place of study, health reasons, to join partner or because of a relationship breakdown. Low-skilled persons appear to be less likely to move for work related reasons than other migrants.

We used greater circle distance calculations between postcodes to calculate how far each person moves for HILDA Waves 2-6. Table 5 (in which movers are only counted once) confirms that the majority of moves are small distance. Intra-regional moves together dominate inter-regional migration (see Gordon, 2003 for similar UK evidence). With over half of movers only shifting 9 kms or less it is unlikely that migration resulted in a material change in local labour market conditions faced by the person. Very few workers moved over 50 kms.

Table 6 shows that only half of the movers change SLA, and of these only a fraction are changing their local labour market conditions as indicated by a change in CofFEE Functional Economic Region.

Table 7 shows that housing-related migration is significantly shorter (around 34 kms on average) than migration motivated by work-related (456 kms on average), personal (218 kms) or neighbourhood (235 kms) reasons. Work related moves most likely involve a shift to new local labour markets with differing economic characteristics. The results are consistent with the UK work of which Owen and Green (1992) are representative. They found intra-urban moves reflect housing factors, while interregional moves are typically job-related (see also Bradbury and Chalmers, 2003).

Low-skill migrants tend to move shorter distances irrespective of reason except when motivated by spouse mobility and "other reasons" (see Table 8).

3.5 The characteristics of mobile workers in Australia

Table 9 shows the percentage of movers by various characteristics for the six waves by skill level. For the entire sample, 16 per cent moved. 14.3 per cent of low-skill workers moved and 16.7 per cent of other workers moved. Some of the key points to note include:

- The low-skill tend to move less than other workers although those with dependent children; sole parents; those aged 16-19, 40-49 and 50-65 years, and those working as tradespersons are exceptions;
- The unemployed are significantly more likely to move than the employed or those not in the labour force, having twice the mobility rate of other labour force groups;
- Family structure is important. Married persons, those with employed spouses, those with dependents have below average moves. The stark exception is sole parents which have significantly higher rates of mobility.
- The young (below 30 years of age) are much more likely to move than older persons. This effect is well documented (OECD, 2005). One explanation is that if mobility is an investment associated with a short-run income loss, then moving is an investment whose returns accrue in the following years (Gardner, Pierre and Oswald, 2001). The young therefore have many more years to reap the benefits of the decision to move, and smaller family and psychic costs to bear in the short-term.
- Home owners and those in state housing have below average rates of mobility whereas renters have more than twice the average overall mobility rate, which reflects larger transactions costs for home-owners contemplating moving relative to renters. State housing tenants in general are more likely to be unemployed, and are less likely to move for job reasons. If they move, they move shorter distances (Coleman and Salt, 1992; Gardner, Pierre and Oswald, 2001), which may reflect constraints on the availability of affordable housing;
- Those with difficulties in English have low rates of mobility;
- Indigenous Australians have above-average rates of mobility;
- In terms of occupations, associate professionals and the lower-skilled occupations have above-average mobility rates. However, this result is driven largely by the movements of workers with more than year 11 of education who are working in these occupations;

- Industry mobility rates are clustered around the overall average, although workers in the services sector are more mobile than others;
- In this sample, the variation by education level is small with the exception of those who only finished Year 12 (well above-average mobility) and low-skill workers (well below-average). OECD (2005) report that one implication of the lower levels of mobility associated with lower educational attainment is that weaker labour market participants are more dependent on local employment opportunities.

3.6 Mobility and socio-economic status of location

The mobility of low-income households is thought to be constrained by housing price differentials, resulting in low-income groups having a lower likelihood of moving. We use the Index of Relative Socio-Economic Disadvantage (IRSED) to examine mobility by socio-economic status of SLA. This is a composite index developed from 2006 ABS Census which focuses on economic and other resources available to a community and published by deciles. A low index value reflects relative disadvantage and occurs in areas with a high proportion of low-income families, persons in low skilled occupations and persons without training. A high value reflects lack of disadvantage in an area. Table 10 shows that skilled workers are no more likely to move from disadvantaged areas than higher decile SLAs. For the low-skill workers, there is an inverse relationship between decile rank and percentage of movers, although overall there does not seem to be any clear relationship socio-economic decile of the origin region and probability of moving. Thus constraints on mobility may only have modest impacts on residents in the most disadvantaged areas.

Tables 11 and 12 provide the share of low-skill and skilled movers, respectively, by IRSED decile of the origin and destination SLAs. Not surprisingly, low-skilled migrants are more likely to originate in low socio-economic status areas and much less likely to live in high SES areas. HILDA data shows that 45.7 per cent of low-skilled persons live in SLAs ranked in the bottom three IRSED deciles, compared to 15 per cent of skilled migrants.

There are some differences in the mobility patterns for skilled and low-skilled workers. All persons at the decile extremities typically move to a similar socio-economic area. There is more variation in the migration patterns of low-skill workers. Low-skill migrants originating from the lowest IRSED decile are more likely to move to a higher IRSED decile than skilled workers from the bottom decile. Further, low-skilled migrants in the top decile are more likely to move into lower ranking deciles, with only 10 per cent of those in the top decile staying in the top decile compared to 61 per cent for skilled workers.

We conclude that constraints on mobility, if they exist for low-skilled migrants in the most disadvantaged areas, do not appear to be binding. We qualify this statement by noting that the data describes movers and does not account for the general lower rates of mobility found amongst the low-skilled.

Other analysis of the HILDA data (not shown) suggests that:

- Destination regions for both low-skilled and other migrants have substantially higher employment growth and slightly lower unemployment rates, compared to conditions that exist in the migrant's origin SLA;

- The low-skilled movers are disadvantaged in areas with higher employment growth because of the increased competition as a result of higher rates of labour force growth

3.7 Labour market transitions and migration

Table 13 shows the labour force transitions of movers and non-movers between waves. Consistent with previous analysis (see Bill and Mitchell, 2006) unemployed persons who move are more likely to find employment in the following wave than unemployed persons who do not move, although factors other than migration might be influential. Those not in the labour force who move are also more likely to find employment. This is consistent with the finding of Boehm *et al.* (1998) that migration is a significant component of renewed job search for heads of household not in the labour force. Finally, those who were employed and move are less likely to be in employment after the move than those who stay put. Some of the "employment leakage" is in a higher propensity for movers who were employed to exit the labour force, perhaps signalling retirement as the motive for migration. These results are not sensitive to the choice of migration measure. Similar results are derived if the change in SLA measure is used.

Table 15 show the labour force transitions between HILDA waves for the low-skilled and skilled workers. A higher proportion of low-skilled workers remain unemployed across the waves and a lower proportion that were unemployed in the previous wave become employed. A much higher percentage of low-skilled workers remain not in the labour force compared to the same state inertia for skilled workers.

Table 16 shows the labour force status of low-skill and other workers. The low-skilled constitute 30.1 per cent of the total sample. They are over-represented in the unemployed and not in the labour force categories and are under-represented in the employed status. The data also shows that only 26.1 per cent of the low-skilled workers enjoyed pay improvements between HILDA waves. This is compared to 37.9 per cent of skilled workers who enjoy improved pay. Thus even in a period when the Australian economy was growing relatively strongly, the low-skilled seem to be less able to participate in the growth via pay improvement.

Table 17 provides a breakdown of the wage outcomes following a change in SLA by broad skill level. Movers have lower initial gross median wages (measured as the total gross amount of most recent pay before deductions) than non-movers. While other workers do not appear to benefit in terms of pay from moving the situation is different for the low-skilled. Moving for them appears to provide greater pecuniary returns in the form of higher wage growth (12.5 per cent compared to 8.7 per cent).

3.8 Minimum wage workers

Using HILDA we can identify persons who are earning the standard Federal minimum wage set by the Fair Pay Commission (since 2006). The hourly wage rate is determined by total gross weekly wages and salary from all jobs, divided by total hours worked in all jobs per week. We can thus examine personal characteristics and mobility rates, both geographic, occupational and industrial, for minimum wage workers. The data is subset to those who are employed and have recorded a valid value for gross weekly earnings. Approximately 11.6 per cent of workers in this dataset are classified as minimum wage workers.

A major characteristics of workers earning the minimum wage are (see Mitchell and Bill, 2008 for more detail):

- They are more likely to be aged 16-19 years, low-skilled and employed as Clerical, Sales and Service Workers and Elementary Clerical, Sales and Service workers, Labourers or Tradespersons;
- They are more likely to be female and from a non-English speaking background and are more likely to have a disability or to be renting.

Table 18 compares mobility rates for workers earning the minimum wage to the rest of the workforce. Minimum wage workers are more likely to move, change occupations and change industry, however they are less likely to be long distance commuters (that is undertake an above average commute for their Major Statistical Region (MSR)).

Table 19 reveals that minimum wage workers are more likely to reside in a low socio-economic status (again using ABS' IRSED measure broken into population weighted deciles) SLAs than other workers, and less likely to reside in higher socio-economic status areas.

4. Econometric analysis of mobility, skill and labour market outcomes

4.1 Introduction

The analysis in this section draws on the pooled cross-sectional dataset, described in Sections 2 and 3. We examine mobility within the last year as a function of the previous year's characteristics. 26 per cent of unemployed who move in our dataset moved within their own postcode and thus cannot be said to be altering their labour market by design or accident and are excluded from the analysis.

Given the taxonomy presented in Sections 3, we seek to use formal econometric modelling to explore the characteristics of mobile labour defined in term of long distance commuting and consider whether low-skilled workers are constrained in this regard. We also explore the employment and pay outcomes that arise from mobility.

The variables chosen in the respective models are conditioned by the analyses in Section 3. The range of structural or region specific variables are commonly included in models of migration and commuting. These include differential employment growth, unemployment rates and amenity adjusted earnings, housing price differentials all of which are deemed relevant in generating disincentives/incentives to move (OECD, 2005: 96). At this stage we do not have data with sufficiently detailed spatial identifiers to undertake this kind of analysis, although the socio-economic decile of the origin and destination region is used as a proxy for the region's local labour market and general economic climate.

4.2 Migration responses for the whole population

In this section, we consider long-distance moves to focus on mobility that is likely to generate significant changes in the labour market conditions encountered by the individual. There are many ways in which we might define a long-distance move. Given data limitations and the inherent arbitrariness of any definition, we chose two possible representations of long migration:

- Change_SLA which takes the value of 1 if the person moves to a different SLA and 0 otherwise; and
- Long_move which takes the value of 1 if a person moved more than 30 kms between waves and 0 otherwise.

The use of an SLA change to define long distance mobility is based on the desire to relate the migration to changing labour market conditions. A move in excess of 30 kms will also possibly produce the same result. Neither measures of mobility guarantee that a person crosses a CofFEE Functional Economic Region boundary given that the latter are aggregates of individual SLAs. With no clear guidance available as to which measure of mobility is superior for the regression modelling, we chose in the outcome models to experiment with both. The major conclusions hold irrespective of the mobility measure used despite some apparent differences.

The dataset contains 25643 observations for 5802 individuals spread over five HILDA waves (2001 to 2005). The explanatory variables are defined one wave prior to the migration (hence we are predicting one period ahead). Further, the importance of this data structure for the modelling is that we have to recognise intra-group correlation among observations on the same person. Thus the assumed independence of each data observation that is assumed by standard regression estimators is violated. Given that the 5802 individuals are observed repeatedly in the sample, we account for this intra-group correlation by using a clustering correction to the standard errors to ensure they are robust.

We estimated a probit of the probability of migration (for both measures) for the entire working age population. We specifically included a variable to capture low-skill worker impacts on the probability of migration. As controls we also included a range of socio-demographic variables recorded for the wave prior to the move.

The resulting probit estimates of the final model selected are reported in Table 20. We report the estimated coefficients and their statistical significance. We summarise the results as follows:

- The results show that low skill workers are significantly less likely to migrate relative to all other workers, other things equal.
- Relative to prime age workers (aged 40-49), the younger aged workers are more likely to migrate whereas older workers (aged 50-65) are significantly, less likely to move. These results are consistent with established life-cycle effects identified in the extant literature.
- While marital status and gender do not appear to be drivers of migration (at 5 per cent or below significance), the employment status of the spouse and the number of children are both negative influences.
- The depth of one's immediate neighbourhood social network is a negative influence on the likelihood of migration.
- A university graduate is more likely to migrate, other things equal. Other levels of tertiary education are not significant factors. So the extremes of the education levels work in opposite directions (low skill (up to year 11 education) are less likely, graduates, more likely).
- Tradespersons are less likely to migrate. There was no other statistically significant impact across the occupational spectrum.

- Being unemployed is only marginally significant and positive.
- Housing status is important. Owner-occupiers have a lower probability of migration, as do state housing tenants. The higher the median price of housing in the MSR where one lives also reduces the likelihood of migration.
- There is a higher probability of migration among residents of metropolitan areas.
- The significant state effects indicate that relative to Australian Capital Territory, residents in NSW, Victoria, Western Australia and Tasmania a less likely to migrate, while Northern Territorians are more likely to move.
- Relatively advantaged regions (regions with low levels of disadvantage) discourage out-migration (IRSED origin region) but at the same time encourage in-migration (IRESD destination region). So regions with strong employment growth, other things equal, will be considered advantaged. This variable is the only feasible way we can model demand-side influences. These variables are not significant when the long_move proxy is employed.

4.3 Migration and labour market outcomes – the problem of selectivity bias

In the following Sections, we aim to estimate the impact of migration on employment outcomes (pay and labour force status) after controlling for various demographic, occupational and regional factors. This impact involves two separate relationships. First, the decision to migrate ($m_i = 1$) is a function of a range of demographic, economic and regional factors, such that

(1) $$m_i = \gamma' \mathbf{z}_i + v_i$$

where **z** is a vector of the factors which motivate the migration decision.

Second, once the person has migrated, the resulting labour market outcome is determined by

(2) $$y_i = \beta' \mathbf{x}_i + \delta' m_i + \varepsilon_i$$

where y_i is the labour market outcome (for example, 1 indicating improvement; 0 otherwise) for the i^{th} person in the sample; **x** is a vector of the factors which influence this outcome independent of the migration impact; and m =1 if the person has migrated and m = 0 if they have not. In both equations, v_i and ε_i are normally distributed random error components.

Estimating Equation (2) directly without considering Equation (1) is unlikely to be a valid modelling strategy. There is every reason to suspect that the motivations (characteristics) that have driven the migration decision are also likely to be correlated with those observed and unobserved attributes that predispose a person to successfully gain employment or improve their labour market outcomes (especially in a rationed labour market). This is the so-called selection bias problem which in the context of Equations (1) and (2) means that *m* is an endogenous regressor and likely to be correlated ε_i. The standard assumptions of regression analysis are then violated.

Selection bias occurs when individuals are not randomly selected into groups, and unobservable characteristics determine the selection. It is argued migrants are likely to be a selective group with inherently more favourable characteristics, such as motivation (Nakosteen and Zimmer, 1980; Herzog *et al.*, 1993). Individuals with higher skills and motivation will be more likely to move and more likely to

subsequently find employment (Bradbury and Chalmers, 2003). If the factors which cause persons to move are unobservable, and cannot be controlled for, then the impact of changing location on employment outcomes will be affected. To control for this we need to control for the tendency of better educated, skilled or motivated residents to move and move into better areas.

In dealing with a labour market application where a selection issue arises, we are presupposing that we have a rationed labour market, that is, that there are not enough jobs to meet the desires of the current labour force. This is definitely the case for Australia in the period covered by the data (2001-2005).

Standard probit estimation of Equation (2) would likely generate biased and inconsistent estimates of the migration coefficient due to the endogenous selectivity because of the likely correlation between the error term and the **x** matrix (via the migration variable).

There are several ways in which we can generate unbiased and consistent estimates of the system of Equations (1) and (2) (see Greene, 2003; Pekkala and Tervo, 2002). The selection bias can be corrected using:

(a) Instrumental variables (IV) to instrument the endogenous migration dummy (see Angrist, 2001; Bill and Mitchell, 2006);

(b) A "treatment-effects" maximum likelihood model (see Maddala, 1983); or

(c) A bivariate probit approach (see Burnett, 1997; and Greene, 2003, 710-714).

Preliminary work (not reported) and previous work (Bill and Mitchell, 2006) shows that there are no significant quantitative or qualitative differences in the outcomes from either the IV or bivariate approaches. We prefer to use the bivariate method in this paper, given the ambiguity in deriving valid instruments. Bill and Mitchell (2006) use the IV approach and find similar results to those reported here (for fewer waves of HILDA).

For the bivariate probit approach, Equations (1) and (2) are simultaneously estimated using maximum likelihood estimation (see Hardin, 1996 for explicit details). We are interested in two issues: (a) whether migration improves one's labour market outcomes in a rationed labour market; and (b) whether the low-skilled enjoy improved labour market outcomes once other influential factors are controlled for.

4.4 Migration and change in labour force status

In this Section we report on models of employment outcomes following migration. We define labour force status variable LFS to take the value of:

- 1 if the person is employed in the current wave ; and
- 0 if the person is unemployed in the current wave.

The dataset thus includes those who have already made the decision to participate in the labour force. A related variable *employed last period* is the LFS variable lagged one wave. We use this lagged variable to capture the advantage of being employed last wave in determining the likelihood of being employed in the current wave.

We continue to employ two representations of long migration:

- Change_SLA which takes the value of 1 if the person moves to a different SLA and 0 otherwise; and

- Long_move which takes the value of 1 if a person moved more than 30 kms between waves and 0 otherwise.

We also define an interactive variable (one for each migration proxy), which is the product of the low-skill variable and the migration proxy, to capture the interaction between low-skill and mobility as an influence on labour force status over and above low-skill and migration. We can thus explore whether migration impacts differentially on skill groups, once a person has moved.

Table 21 reports the bivariate regression results for each of the migration proxies. An (unreported) comparison between the simple probit results and the bivariate probit estimates demonstrates that selection bias is present and the systems estimator is warranted. The results are fairly consistent across the two mobility measures. The main results common to both mobility measures are:

- The exogeneity test statistic (not published) is significant supporting our use of the bi-variate probit approach. Once corrected we find both mobility measures to be statistically significant and indicating that workers who move other things equal decrease their likelihood of being employed in the current wave;
- For the Change_SLA migration measure, the results suggest that a low-skill worker *per se* is not statistically significant. However, low-skill workers who move compound the disadvantages of migration. For the Long_move migration measure, there are no statistically significant interactive effects but low-skill worker *per se* have a lower probability of being employed in the current wave than other workers;
- Commuting long distance enhances the probability that a person will be employed in the current wave. This is best interpreted as meaning that the willingness to commute long opens up more employment opportunities for a person.
- A person who was employed in the last wave has a much higher likelihood of remaining so in the next wave, while a person who is unemployed is much less likely to exit that state.
- The young (under 29 years of age) are at a disadvantage in the labour market, other things equal. They have lower probabilities (against the base case) of being employed in the current wave;
- Persons from NESB, those who are not proficient in English and those with disabilities are less likely to be employed in the current wave.
- Females are more likely to be employed than men.
- Graduates and tradespersons are more likely to be employed in the current wave relative to other educational levels and occupations.
- Significantly, the higher the socio-economic status of the region where the person moves the more likely the person will be employed (although this is offset by the overall disadvantages of migration).
- The factors determining the decision to move are all consistent with the literature.

4.5 Migration and pay improvement

In this Section, we seek to determine whether migration brings pay improvements. The dependent variable in the regressions, *pay*, takes the value of:

- 1 if the respondent reported an increase in pay in the current HILDA wave; and
- 0 if there was no pay improvement (or deterioration) reported in the current wave.

We continue to you the two long migration proxies and the interactive variable defined in Section 6.4.

Table 22 presents the bivariate probit regression results for each of the migration measures. Once again, the (unreported) comparison between the simple probit results and the bivariate probit estimates supports the use of a systems estimator. The main results common to both mobility measures are:

- The exogeneity test statistic (not published) is significant and thus supports our use of the bi-variate probit approach. Once corrected the results suggest that mobility increases the likelihood of higher pay, other things equal;
- Significantly, while mobility is generally good for workers, the low-skill suffer a reduced likelihood of gaining a pay rise, other things equal. However, movement overall outweighs the disadvantage of skill;
- Labour force status across waves is significant and a person who was employed in the last wave has a much higher likelihood of enjoying higher pave in the next wave, while if the person remains unemployed across waves clearly has a lower probability of gaining increases in pay;
- Commuting long distance increases the probability of improving pay, as does changing occupation and changing industry;
- Other positive influences include being under 30 years of age, having an employed spouse, have a university degree, living in a metropolitan SLA, being a part-time worker, and working in a trade (for the long_move proxy only). Some of these results deserve further scrutiny (for example, part-time status) but such an enquiry is outside the scope of this research;
- Significant negative influences on the probability of enjoying growth in pay include being over 50 years of age, having a disability and being unemployed. Migration does not overcome the disadvantage of being unemployed;
- State dummies were included but were not significant. There were also no significant panel effects across the years (2001, 2002 and 2003);
- The factors determining the decision to move are all consistent with the literature.

4.6 Migration and occupational mobility

In this Section we report on the impact of migration on the likelihood of changing occupation between waves. The dependent variable, CHANGE_OCCUPATION takes the value of:

- 1 if the person changed occupation in the current wave; and
- 0 if the person did not change occupation in the current wave.

We continue to use the two long migration proxies and the interactive variable.

Table 23 reports the bivariate regression results for each of the migration proxies. The results are fairly consistent across the two mobility measures and are summarised as:

- Using the Change_SLA migration measure, the estimates reveal that mobility increases the likelihood of an occupational change occurring, other things equal. The mobility measure was only significantly positive at the 10 per cent level for the Long_move proxy;
- Low-skill workers have a lower probability of changing occupation. Using the Change_SLA measure, the low-skill workers that move reduce (but do not negate) the advantages of mobility with respect to occupational change;
- All workers up to 40 years of age enjoy a higher probability of changing occupation relative to the base (40-49 years of age) whereas older workers (aged 50-65 years) have a lower likelihood;
- English proficiency and disability significantly reduces one's chances of changing occupation;
- Part-time workers have a higher likelihood of changing occupation;
- The positive impact on the probability of changing occupation for University graduates is only statistically significant in the Long_move case;
- Managers, Associate Professionals, and Clerical workers are more likely to change occupation, whereas Professionals and Tradespersons are less likely.
- Of the significant industry dummies workers in Manufacturing are more likely to change occupation, whereas workers in the Government Administration and Defence and Education sectors are less likely.
- The higher the socio-economic status of the region where the person moves the more likely the person will change occupation which reinforces the overall advantages of migration.
- The factors determining the decision to move are all consistent with the literature.

5. Conclusion

Our results confirm that low-skilled workers are less likely to move than other persons and are less likely to move for work reasons. An implication of the lower levels of mobility associated with lower educational attainment is that weaker labour market participants are more dependent on local employment opportunities.

However, descriptive analysis at the SLA level reveals that there is little evidence that low skilled persons are choosing high unemployment, low housing cost regions over buoyant labour markets.

Certainly as Boehm *et al*., (1998: 10) argue 'a fundamental issue for all migrants is the extent to which they select destination labour markets with more favourable job opportunities.' Although destination characteristics are captured in the socio-economic decile of the destination region, this variable is a crude proxy for local labour market conditions.

The regression results reinforce the findings that low-skill workers are less likely to move and when they do reinforce the disadvantage of mobility for gaining employment.

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Table 1 Characteristics of low-skilled and other workers, 2001-2005, per cent

Characteristic	Other Workers	Low-skilled
Employed	81.8	60.6
Unemployed	2.4	3.6
Not in the Labour Force	15.8	35.8
Part-time worker	21.4	23.0
Female	49.9	62.3
Married	60.0	61.5
Spouse employed	58.8	45.1
Have dependent children	50.7	49.0
Family with dependents	37.2	30.8
Sole parent	4.6	6.5
Disability	13.1	22.4
Aged 16-19 years	1.2	1.6
Aged 20-29 years	15.9	9.2
Aged 30-39 years	25.6	20.5
Aged 40-49 years	30.4	27.3
Aged 50-65 years	26.9	41.3
Own house	74.8	71.2
Rent	22.9	26.5
State housing	2.6	6.4
Low English language proficiency	0.6	0.9
Indigenous	1.4	2.8
Non English speaking background	12.3	8.3
Social Interaction	23.0	23.0
Manager	7.2	4.2
Professional	23.3	2.9
Associate Professional	10.6	5.9
Tradesperson	8.2	4.5
Advanced and Intermediate Clerical	13.2	15.5
Intermediate Production Workers	3.9	8.4
Elementary Clerical	3.8	7.0
Labourer	3.6	10.5
Agriculture and Mining sector	4.5	7.7
Manufacturing sector	9.2	8.2
Utilities and Construction sector	5.9	4.5
Services sector	31.4	28.0
Transport sector	3.0	4.2
Government and Education sector	11.7	28.5

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 2 Median gross weekly wage by broad skill level, employment status and metropolitan indicator

Employment status by broad skill level	Median gross weekly wages ($)
Non-Metropolitan Region	
Full-time, Other	1,530.00
Full-time, Low-skill	1,000.50
Part-time, Other	656.00
Part-time, Low- skill	448.50
Metropolitan Region	
Full-time, Other	2,000.00
Full-time, Low- skill	1,200.00
Part-time, Other	850.00
Part-time, Low- skill	538.00

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 3 Numbers and proportions of movers by skill level, 2001-2006

Year	Skilled	% of cohort	Low-skill	% of cohort	All movers	% of cohort
2001	684	20.2	299	17.5	983	19.3
2002	540	15.7	220	13.3	760	15.0
2003	628	17.7	254	15.8	882	17.1
2004	557	15.5	214	13.7	771	14.9
2005	619	16.9	185	12.4	804	15.6
2006	572	14.8	186	12.6	758	14.2
Total	3600	16.8	1,358	14.3	4,958	16.0

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 4 Reason for moving by broad skill level, 2001-2006, per cent

Reason for moving	Other Workers	Low-Skill	Total
	Per cent	Per cent	Per cent
Work related	17	11.3	15.5
Personal	25.8	25.7	25.7
Housing related	52.2	54.4	52.8
Neighbourhood attributes	18	18.5	18.2
Spouse moving	3.3	3.6	3.3
Other	3.3	1.4	2.8

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006. Note: multiple reasons are listed so percentage shares do not necessarily add to 100 per cent.

Table 5 Distance moved by broad skill level, Waves 2-6, per cent

Skill level	Or moved within postcode	Percentage of movers by kilometre bands						
		1-5	5-9	10-19	20-49	50-99	100-499	500+
Other	9.4	35.9	11.7	12.8	7.8	3.7	8.0	10.7
Low-skill	10.4	36.6	10.3	13.7	8.6	4.6	7.7	8.2

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 6 Percentage moving by type of migration, Wave 1-5

Type of move	Other	Low-skilled	Total
		No qualification past year 11	
	Per cent	Per cent	Per cent
Moved - changed address	17.2	14.6	16.4
Changed SLA	9.4	7	6.6
Changed Functional Economic Region	3.7	2.8	3.4

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006. Note: in merging on the Functional Economic Region geography which is constructed on the basis of 2006 SLAs, a number of records are deleted due to a lack of concordance between 2001 and 2006 ABS SLAs.

Table 7 Reason for moving by distance moved, 2001-2006, kms

Reasons for Moving	Average Distance Moved (kms)
Work related	456.8
Personal	218.16
House related	34.62
Other	129.5
Neighbourhood attributes	235.5
Spouse moving	476.0

Source: HILDA, Waves 1-6, 2001-2006.

Table 8 Reason for moving by distance moved and broad skill level, 2001-2006

Reasons for Moving	Average distance moved (kms)	
	Other	Low-skill
Work related	468.6	408.3
Personal	227.9	187.5
House related	37.1	27.1
Other	121.5	160.8
Neighbourhood attributes	238.2	228.1
Spouse moving	402.7	714.7

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 9 Characteristics of movers, 2001-2006, per cent of cohort

Characteristic	Low-skill	Other	All Movers
Employed	12.8	16.8	15.8
Unemployed	22.0	27.7	29.9
Not in the Labour Force	15.0	14.8	14.9
Part-time worker	11.5	14.2	13.4
Female	14.0	17.1	16.0
Married	9.3	10.9	10.4
Spouse employed	10.3	14.0	13.1
Have dependent children	13.7	12.2	12.7
Family with dependents	13.9	13.7	13.7
Sole parent	28.2	20.6	23.5
Disability	14.2	14.7	14.5
Aged 16-19 years	38.2	31.3	33.9
Aged 20-29 years	35.1	37.2	36.7
Aged 30-39 years	18.2	20.1	19.6
Aged 40-49 years	12.1	10.7	11.1
Aged 50-65 years	8.3	7.8	8.0
Own house	7.8	9.7	9.1
Rent	30.8	38.2	35.7
State housing	12.5	14.6	13.5
Low English language proficiency	7.9	8.7	8.4
Indigenous	22.4	25.1	23.8
Non English speaking background	10.0	14.3	13.3
Social Interaction	10.8	12.7	12.1

Table 9 Characteristics of movers, 2001-2006, per cent of cohort (continued)

Characteristic	Low-skill	Other	All Movers
Manager	6.5	11.5	10.5
Professional	12.4	15.2	15.1
Associate Professional	12.2	18.5	17.2
Tradesperson	18.8	16.2	13.5
Advanced and Intermediate Clerical	13.5	17.4	16.1
Intermediate Production Workers	13.5	15.3	14.4
Elementary Clerical	13.7	20.5	17.4
Labourer	16.6	22.3	19.1
Agriculture and Mining sector	11.3	14.2	13.0
Manufacturing sector	13.1	17.9	16.5
Utilities and Construction sector	16.1	16.3	16.2
Services sector	15.0	19.0	17.9
Transport sector	12.3	18.6	16.2
Government and Education sector	13.2	14.6	14.4
Graduate			16.6
Diploma			14.6
Certificate			15.9
Year 12			20.0
Low-skill			14.3

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 10 Percentage movers, socio-economic status of origin SLA by broad skill level, 2006, per cent

	% Movers	
Socio-economic status of origin SLA	Low-skill	Other
Decile 1 (most disadvantaged)	21	31
Decile 2	21	30
Decile3	19	29
Decile 4	21	30
Decile 5	21	30
Decile 6	22	29
Decile 7	24	32
Decile 8	24	33
Decile 9	23	32
Decile 10 (least disadvantaged)	23	31

Source: ABS, Census of Population and Housing 2006, Custom Data.

Table 11 IRSED decile of origin and destination SLAs, 2006 (moved 1 year ago), low-skilled migrants, percentage share of movers

Origin SLA IRSED	Destination SLA IRSED (least advantaged to most advantaged)										
	1	2	3	4	5	6	7	8	9	10	Total
1 (least advantaged)	**48.9**	9.6	4.0	5.2	6.7	4.4	8.2	2.2	11.9	0.0	16.4
2	6.8	**21.8**	9.8	2.3	15.8	11.3	15.0	12.0	0.0	5.3	16.1
3	5.5	8.3	**44.0**	8.3	11.0	6.4	5.5	5.5	0.0	5.5	13.2
4	0.0	9.8	10.9	**35.9**	10.9	3.3	9.8	12.0	7.6	0.0	11.2
5	4.8	12.1	13.3	15.7	**22.9**	10.8	15.7	0.0	4.8	0.0	10.1
6	12.9	8.6	7.1	14.3	20.0	**28.6**	4.3	0.0	4.3	0.0	8.5
7	10.2	5.1	5.1	5.1	15.3	11.9	**27.1**	20.3	0.0	0.0	7.2
8	4.1	10.8	5.4	0.0	0.0	18.9	23.0	**10.8**	9.5	17.6	9.0
9	7.1	0.0	28.6	0.0	7.1	14.3	0.0	21.4	**7.1**	14.3	5.1
10 (most advantaged)	10.7	0.0	0.0	35.7	0.0	10.7	0.0	10.7	21.4	**10.7**	3.4

Source: ABS, Census of Population and Housing 2006, Custom Data.

Table 12 IRSED decile of origin and destination SLAs, 2006 (moved 1 year ago), skilled migrants, percentage share of movers

Origin SLA IRSED	Destination SLA IRSED (least advantaged to most advantaged)										
	1	2	3	4	5	6	7	8	9	10	Total
1(least advantaged)	**46.5**	8.0	7.3	7.3	8.6	6.0	7.0	4.3	3.7	1.3	4.1
2	8.5	**56.4**	10.6	4.4	3.9	1.4	5.7	1.6	4.6	3.0	5.9
3	5.5	7.7	**40.1**	12.7	9.1	8.3	4.1	8.0	2.8	1.7	4.9
4	3.7	5.5	11.9	**41.3**	8.0	5.5	7.1	8.5	5.0	3.7	5.9
5	3.6	5.6	5.1	5.4	**52.6**	11.0	6.3	5.1	1.6	3.8	7.5
6	3.3	5.0	5.2	5.2	3.2	**60.7**	5.6	3.9	5.0	2.9	11.1
7	1.2	4.8	4.8	8.9	5.0	12.7	**37.1**	8.7	9.1	7.7	6.5
8	1.7	0.6	0.9	1.4	1.5	1.9	1.8	**82.2**	3.6	4.6	29.3
9	1.8	1.1	1.4	1.3	4.8	4.0	5.0	9.7	**62.2**	8.8	12.5
10 (most advantaged)	4.3	4.1	0.3	3.4	0.8	4.4	6.9	7.3	7.5	**61.0**	12.3

Source: ABS, Census of Population and Housing 2006, Custom Data.

Table 13 Employment transition rates for movers and non-movers, Waves 1-6, per cent

Previous Wave	Current Wave		
	Employed	Unemployed	Not in the Labour Force
Did not move			
Employed	94.3	1.1	4.6
Unemployed	48.7	26.8	24.5
Not in the Labour Force	15.5	3.3	81.1
Moved			
Employed	90.4	2.9	6.7
Unemployed	54.5	23.6	21.8
Not in the Labour Force	22.3	6.6	71.0

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 15 Labour force transitions for low skill and skilled, 2001-2005, per cent

Low-skill workers	Labour Force status in previous wave (%)			
Current LF status	Employed	Unemployed	Not in LF	Total
Employed	91.3	43.1	10.8	60.5
Unemployed	1.6	31.1	3.2	3.3
Not in LF	7.1	25.8	86.1	36.2
Total	100.0	100.0	100.0	100.0
Skilled workers				
Current LF status	Employed	Unemployed	Not in LF	Total
Employed	94.5	52.5	18.8	81.5
Unemployed	1.3	22.9	3.7	2.2
Not in LF	4.2	24.5	77.5	16.3
Total	100.0	100.0	100.0	100.0

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 16 Labour status and pay outcomes by skill classification, 2001-2005, various units

	Skilled	Low-skilled	Total
Labour force status			
Employed (No, %)	17,582 (81.8)	5,747 (60.6)	23,329 (75.3)
Unemployed (No, %)	516 (2.4)	345 (3.6)	8.61 (2.8)
Not in labour force (No, %)	3,389 (15.8)	3,400 (35.8)	6,789 (21.9)
Total (No, %)	21,487 (100.0)	9,492 (100.0)	30,979 (100.0)
Pay outcomes			
No improve in pay (No, %)	13,334 (62.1)	7,012 (73.9)	20,346 (65.7)
Pay improvement (No, %)	8,153 (37.9)	2,480 (26.1)	10,633 (34.3)
Total (No, %)	21,487 (100.0)	9,492 (100.0)	30,979 (100.0)

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 17 Wage outcomes following a change in SLA by broad skill level

	Median gross wage ($) Previous wave	Median gross wage ($) Current wave	Percentage Change
Did Not Move			
Other	1,502	1,649	9.8
Low-skill	850	924	8.7
Moved			
Other	1,462	1,600	9.4
Low-skill	800	900	12.5

Source: HILDA, Unconfidentialised, Waves 1-6, 2001-2006.

Table 18 Mobility rates minimum wage workers, 2002-2006, per cent

Type of mobility	Minimum Wage Worker	Non-Minimum Wage Worker
Moved	16.3	19.3
Changed SLA	11.2	11.9
Changed Occupation	41.3	45.8
Change Industry	33.2	39.0
Long Commute (above average for MSR)	41.1	31.7

Source: HILDA, Unconfidentialised, Waves 2-6. Note: Data is subset to include only employed persons with a valid value recorded for their gross weekly wage.

Table 19 Mobility rates minimum wage workers, 2002-2006 by IRSED decile, per cent

Decile	Other Workers	Minimum Wage
Decile 1 (least advantaged)	6.8	7.6
Decile 2	8.6	12.2
Decile 3	10.0	11.0
Decile 4	7.1	8.5
Decile 5	8.8	12.3
Decile 6	10.4	11.1
Decile 7	12.2	12.2
Decile 8	10.7	8.8
Decile 9	13.1	9.4
Decile 10 (most advantaged)	12.2	6.8
Total	88.6	11.4

Source: HILDA, Unconfidentialised, Waves 2-6. Note: Data is subset to include only employed persons with a valid value recorded for their gross weekly wage.

Table 20 Probability of migration, probit estimates, 2001-2005

Explanatory variable	Change_SLA	Long_move
	Coefficient	Coefficient
Low-skill worker	-0.079**	-0.111**
Age 16-19	0.417*	0.443*
Age 20-29	0.424*	0.284*
Age 30-39	0.185*	0.196*
Age 40-49	base	base
Age 50-65	-0.146*	-0.015
Married	-0.066***	-0.017
Spouse employed	-0.080**	-0.086**
Sole parent	-0.059	-0.022
Female	-0.020	0.001
Children (number)	-0.086*	-0.070*
Social networks	-0.219*	-0.111**
Non-English speaking background	-0.054	-0.180*
University graduate	0.069**	0.081***
Median house price of MSR	-0.000*	-0.000**
Owner-occupier	-0.681*	-0.515*
State housing	-0.557*	-0.404*
Tradesperson	-0.139**	-0.026
Unemployed	0.108***	0.141***
Metropolitan location	0.178*	-0.228*
NSW	-0.446*	-0.230*
Victoria	-0.293*	-0.213*
Western Australia	-0.258*	-0.152
Tasmania	-0.417*	-0.433*
Northern Territory	0.321*	0.231***
Australian Capital Territory	base	base
IRSED origin region	-0.031*	-0.020
IRSED destination region	0.039*	0.014
Constant	-0.048	-0.691*
No. of observations	25,643	25,643
Prob > Chi^2	0.000	0.000
Correctly classified	91.4 per cent	96.6 per cent

Notes: IRSED is the Index of Relative Socio-Economic Disadvantage. Note: * denotes 1 per cent significance, ** denotes 5 per cent significance, *** denotes 10 per cent significance.

Table 21 Bivariate probit estimates for labour force outcomes and mobility, 2001-2005, dependent variable: LFS (employed = 1)

Regressor	LFS equation	Change SLA	LFS equation	Long Move
	Coefficient	Coefficient	Coefficient	Coefficient
Mobility measure	-0.649*		-0.656*	
Low-skill worker	-0.059		-0.162*	
Low-skill/Mobility interaction	-0.216*		-0.263	
Long commuter	0.774*		0.907*	
Employed last period	0.968*		0.851*	
Age 16-19	-0.635*		-0.762*	
Age 20-29	-0.237*		-0.279*	
Age 30-39	-0.019		-0.024	
Age 50-65	-0.003		-0.015	
Female	0.089**		0.092*	
NESB	-0.300*		-0.349*	
English proficiency	-0.419**		-0.428**	
Disability	-0.398*		-0.495*	
University graduate	0.136**		0.161**	
Tradesperson	0.250*		0.251**	
IRSED destination region	0.055*		0.063*	
Metropolitan resident	-0.069	0.051*	-0.125*	-0.422*
Sole parent		-0.147*		-0.178
Married		-0.014		-0.216*
Home owner		-0.395*		-0.604*
Employed spouse		-0.175*		-0.104
State housing		-0.336*		-0.559*
Contracted move		1.687*		1.899*
Constant	0.949*	-0.202*	1.062*	-1.201*
Number of observations	19975		19975	
Number of clusters	4980		4980	

Note: LFS refers to employment status is current wave (1 = employed; 0 = unemployed. * denotes 1 per cent significance, ** denotes 5 per cent significance.

Table 22 Bivariate probit estimates for pay improvement and mobility, 2001-2005, dependent variable: Pay = 1

Regressor	Pay Equation Coefficient	Change SLA Coefficient	Pay Equation Coefficient	Long Move Coefficient
Mobility measure	0.991**		0.423*	
Employed last period	0.757*		1.133*	
Low-skill worker	-0.066*		-0.064*	
Low-skill/Mobility interaction	0.028		-0.016	
Long commuter	0.160*		0.167*	
Employed spouse	0.274*		0.249*	
Changed job	-0.055		-0.067**	
Changed occupation	0.181*		0.249*	
Changed industry	0.172*		0.240*	
Part-time worker	0.177*		0.223*	
Age 16-19	0.449*		0.575*	
Age 20-29	0.149**		0.199*	
Age 30-39	0.002		0.003	
Age 50-65	-0.135*		-0.153*	
Female	-0.005		0.004	
NESB	-0.044		-0.046	
English proficiency	-0.126		-0.131	
Disability	-0.186*		-0.181*	
University graduate	0.062*		0.070*	
Tradesperson	0.049		0.084**	
Unemployed	-1.346*		-1.588*	
Metropolitan resident	0.075*	0.045*	0.108*	-0.389*
Sole parent		-0.050*		-0.098
Married		-0.160*		-0.214*
Home owner		-0.339*		-0.561**
State housing		-0.306*		-0.526*
Contracted move		1.536*		1.936*
Constant	-1.457*	-0.378*	-1.656*	-1.234*
Number of observations	30979		30979	
Number of clusters	5925		5925	

Note: * denotes 1 per cent significance, ** denotes 5 per cent significance.

Table 23 Bivariate probit estimates for occupational change and mobility, 2001-2005, dependent variable: OCCUPATION_CHANGE = 1

Regressor	OCC CHG Equation Coefficient	Change SLA Coefficient	OCC CHG Equation Coefficient	Long Move Coefficient
Mobility measure	0.467*		0.277	
Low-skill worker	-0.069**		-0.091*	
Low-skill/Mobility interaction	-0.077**		-0.108	
Age 16-19	0.551*		0.572*	
Age 20-29	0.256*		0.287*	
Age 30-39	0.100*		0.111*	
Age 50-65	-0.199*		-0.207*	
Female	-0.138*		-0.145*	
NESB	-0.008		-0.006	
English proficiency	-0.326**		-0.333**	
Disability	-0.192*		-0.197*	
Graduate	0.044		0.053*	
Part-time	0.386*		0.387*	
Manager	0.162*		0.123*	
Professional	-0.080**		-0.123*	
Associate professional	0.305*		0.277*	
Tradesperson	-0.203*		-0.237*	
Clerical	0.261*		0.239*	
Manufacturing	0.256*		0.265*	
Government/Education	-0.125*		-0.115*	
IRSED destination region	0.009**		0.010**	
Sole parent		-0.087**		-0.128
Married		-0.086*		-0.114**
Home ownership		-0.368*		-0.570*
Spouse employed		0.015		-0.198*
State housing occupant		-0.349*		-0.614*
Contracted move		1.851*		1.884*
Metropolitan SLA		0.057*		-0.418*
Constant	-0.576*	-0.311*	-0.456*	-1.196*
Number of observations	25644		25644	
Number of clusters	5802		5802	

Note: * denotes 1 per cent significance, ** denotes 5 per cent significance.

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