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The Determinants of Labour Force Status among Indigenous Australians

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Abstract

It is well established that Indigenous Australians are heavily over-represented among Australia's most disadvantaged citizens. An important component of this disadvantage is the limited and often unsuccessful engagement of Indigenous people with the labour market. To better understand this reality, the present paper explores the forces which influence the labour market status of Indigenous people. For this purpose, multinomial logit regression analysis is used to model labour force status as a function of factors relating to geography, demographic characteristics, education, health, culture, crime and housing issues. The analysis is conducted utilising the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS). The paper gives particular attention to geographic issues, revealing significant variations between the determinants of labour force status in non-remote and remote areas. The results demonstrate the relevance of a wide range of factors in determining the probability of employment among Indigenous people, highlighting the complex array of issues which should be considered in attempts to increase employment.

JEL Classification: J010; J150; J400; J420

1. Introduction

It is well established that the Aboriginal and Torres Strait Islander (Indigenous) people of Australia fare poorly against standard indicators of wellbeing and are heavily over-represented among Australia's most disadvantaged citizens. A significant component of this disadvantage is the economic and social consequences of relatively weak labour market engagement among the Indigenous community. Indeed, many Indigenous

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leaders contend that limited and unsuccessful participation in the labour market is intrinsic to the perpetuation of poor socio-economic outcomes endured by many Indigenous Australians (Ah Kit, 2002). Given this, a clearer understanding of the determinants of Indigenous labour market outcomes is of fundamental importance to policy attempts, such as the ongoing 'Closing the Gap' initiative, to enhance the wellbeing of Australia's Indigenous community.

The present study provides a comprehensive analysis of the determinants of labour market status among Indigenous Australians. This investigation is conducted using multinomial logit regression analysis, in which labour force status is modelled as a function of factors relating to geography, demographic characteristics, education, health, culture, crime and housing issues. A particular focus of the analysis is on the variations in labour market outcomes between geographic regions and the causes of these variations. This is an important focus given the significant cultural, social, historical and economic heterogeneity of the Indigenous population across regions, particularly between non-remote and remote areas, which have increasingly become a topic of academic and policy focus (Hughes, 2007; Hunter, 2007).

As a framework for understanding the Indigenous labour market, the present study also considers the relevance of the neoclassical model and the contrasting Segmented Labour Market (SLM) theory. It does so by considering which model's expectations regarding the determinants of labour force status are most consistent with the empirical evidence presented in this paper. It is found that the results are indicative of those anticipated by SLM theory, implying that some Indigenous people are relegated to a 'secondary' labour market and may be poorly positioned to enjoy the benefits normally associated with increased human capital. As such, this paper points to the need for policy makers to be aware of, and engage with, the broad range of socio-cultural influences pertinent to shaping the labour market experiences of Indigenous people.

The paper starts with a review of prior research on the factors associated with labour force status among Indigenous Australians, presented in section 2. Next, section 3 outlines the data issues and methodology for the empirical analysis, the results of which are included in section 4. The implications of these results in terms of SLM theory are considered in section 5, with the discussion concluded in section 6.

2. Literature Review

Previous analyses of labour market outcomes among Indigenous Australians tend to explicitly or implicitly utilise the dominant neoclassical human capital framework. In this framework, employment and labour supply are expected to respond positively to increased human capital, such as education. In contrast, SLM theory contends that human capital may have only a limited role in determining an individual's labour force status relative to the dominant effect of socio-cultural or institutional factors (Cain, 1976, p. 1222). Of interest to the present study, SLM theory emerged from observations relating to disadvantaged minorities operating in 'ghetto labour markets [in which] the factors conventionally associated with "productivity" – like years of schooling and vocational training – had almost no influence on employment prospects' (Gordon, 1972, p. 44).

The most commonly invoked model of SLMs is the 'dual market theory' – in which workers are split between a primary market, with stable employment and good returns to human capital, and a secondary market, with the opposite characteristics (Dickens and Land, 1988, p. 129). Competition between these segments is restricted by factors not included in the neoclassical model's human capital framework. That is, individuals are relegated to the secondary labour market due to constraints unrelated to human capital, with such constraints including a complex array of social, cultural and institutional factors such as social customs, motivations, preferences or 'tastes for work', and discrimination (Cain, 1977, p. 1222). These factors may also interact with other constraints, like geographic location, further contributing to the labour market segmentation process (Bauder, 2001, p. 39). The origins of SLM theory and its purported relevance to minority groups with poor labour market outcomes (Leontaridi, 2001) provides strong prima facie grounds for considering its applicability to the labour market for Indigenous Australians.

It is important to note that this paper does not propose a formal test to determine whether the labour market for Indigenous Australians can be categorised as a SLM.[1] Instead, the paper considers the results of its empirical analysis in terms of their congruence with the contrasting expectations of the neoclassical model and SLM theory. In particular, if employment probability is found to be insensitive to standard measures of human capital, such as education and health status, this would conflict with the expectations of the neoclassical model and provide an indication that the SLM model may be a more accurate depiction of the labour market for Indigenous people. With this in mind, it is appropriate to turn to the paper's review of past studies on the determinants of labour force status of Indigenous Australians.

At the outset of this review, it is useful to consider the labour market implications of the Community Development and Employment Program (CDEP). The CDEP was established in 1977 to provide community managed incomes for remote Indigenous communities with weak local labour markets. It since spread to most areas with significant Indigenous populations and in 2002-03 covered 12.7 per cent of Indigenous people aged 15 to 64 (Altman *et al*., 2005, p. 6). At this time, CDEP participants were remunerated for work ranging from health and education assistants, to activities traditionally outside employment, in some instances including housework or attending funerals (Hudson, 2008, p. 2). This diversity of activities reflects the CDEP's disparate objectives, such as: supplementing scarce opportunities for work; supporting community development and cultural activities; delivering income assistance and building work readiness (Altman and Sanders, 2008, p. 4). An important issue relating to the CDEP is its heavy concentration in remote and very remote areas, where it covered 16.9 and 42.2 per cent of working age Indigenous people respectively in 2002-03, compared to only 4.7 per cent of this group in non-remote areas (Gray and Chapman, 2006, p. 117). This highlights that, as a government program in which participation is not driven by typical market forces, determinants of CDEP participation differ markedly from those of mainstream employment. This complicates standard analysis, meaning that many studies classify CDEP participation

[1] Indeed, despite widespread application of SLM models, formal tests for the presence of SLMs remain a matter of controversy (Leontaridi, 2001, p. 96), a controversy with which this paper does not seek to engage.

as a fourth labour force category, distinct from mainstream employment (henceforth simply 'employment'), a precedent to which this paper adheres.

Geography

Holding other things constant, living in remote areas is known to have a significant negative effect on employment. One study finds that, relative to a reference group which 'lives in an urban area but not in a capital city', living in a remote area had a negative marginal effect on employment of 11.6 and 6.7 percentage points for men and women respectively (Hunter and Gray, 2001, pp. 122-3). Significantly, however, remoteness is not associated with a fall in labour force participation and is actually accompanied by a decrease in unemployment. This seemingly paradoxical result is driven by the role of CDEP, participation in which increased by 23.3 percentage points in association with living in remote areas (Hunter and Gray, 2001, pp. 122-3).

In addition to weak labour market conditions, a number of other factors are widely recognised as contributing to the low rates of employment in remote areas. In particular, education levels and other elements of human capital are typically lower in remote areas, while remote populations generally have stronger attachment to traditional cultures and relatively weak relationships with non-Indigenous society and institutions (Gray and Chapman, 2006, pp. 117-8).

Age

Age is included as a determinant in many models of labour force status to capture the life-cycle effect on labour supply and to act as a proxy for labour market experience. However, given the relatively weak labour market attachment of the Indigenous population, it is likely that the raw variable of age will tend to overstate labour market experience and thus some doubt has been cast on the relevance of age as a proxy for experience (Daly, 1994, p. 8; Gray and Chapman, 2006, p. 120). This concern notwithstanding, studies of the Indigenous labour market report results consistent with standard expectations. That is, the marginal effect of age on employment and labour force participation is consistently found to be positive, at least until a critical point, typically around 45 years of age (Biddle and Webster, 2007; Hunter and Gray, 2001).

Family Characteristics

Differing conclusions have been reached regarding the labour market implications of marriage among Indigenous people. Some studies (Daly, 1995; Hunter and Gray, 2001) found that marriage is associated with decreased employment among women, but with an increase for males. However, other papers show a positive association between marriage and employment probability among both males and females (Borland and Hunter, 2000; Ross, 2006), which contrasts with Gray and Hunter (1999), who find a negative effect for both males and females. Despite this incongruity, these studies consistently find that the marginal effect of marriage is more positive, or less negative, for males than for females.

Hunter and Gray (2001) find that the presence of dependants is associated with a fall in employment among both males and females. This effect is strongest for females and increases for more children, with a negative marginal effect of over 20

percentage points for women with four or more children (Hunter and Gray, 2001, p. 23). The key features of these findings are similar to other studies of Indigenous people which used the same data (Borland and Hunter, 2000) and those utilising Census data (Daly, 1995).

Education

Consistent with the human capital frameworks predictions, virtually all studies have found increased education to be associated with a statistically significant positive effect on labour force participation and employment rates among Indigenous people (Biddle and Webster, 2007; Borland and Hunter, 2000; Daly, 1995; Hunter and Daly, 2008; Hunter and Gray, 2001; Ross, 2006). The positive effects of education were found to extend to both school and non-school qualifications. For example, studies which used 'left school between years six and nine' as the reference group found that the positive marginal effect on the probability of employment of completing year 12 schooling was between 10 and 25 percentage points, while a non-school qualification was associated with positive marginal effects up to 25.5 percentage points (Borland and Hunter, 2000, p.136; Hunter and Gray, 2001, pp. 122-3). A variable for 'difficulty in English' is also often considered and has been found to have a negative marginal effect on the probability of employment, ranging from 6.4 to 16.4 percentage points (Borland and Hunter, 2000; Hunter and Gray, 2001).

Using the 2001 Census, Hunter (2004) examines the inter-regional variations in the effect of educational attainment on the probability of employment. It is found that education generally has a stronger effect in remote areas than in metropolitan areas (Hunter, 2004, p. 71). It is suggested that this contrast is driven by a 'signalling' effect in remote areas, where education levels are generally lower, meaning that those who have more qualifications send a strong signal to potential employers regarding their ability and motivation (Hunter, 2004, p. 70). However, Biddle (2006) makes a contrary finding, suggesting that education tends to have a weaker effect on the ability of Indigenous people to find a job in remote areas than in non-remote areas (Biddle, 2006, p. 187).

Health

Within the human capital framework, an individual's health affects their labour force status through its implications for their labour market productivity. Two main measures of Indigenous health, 'self-assessed health status' (SAHS) and disability status, are available in the relevant data sets and are analysed by several studies (Borland and Hunter, 2000; Hunter and Daly, 2008; Hunter and Gray, 2001; Ross, 2006).[2] While there is some concern regarding the consistency of information relating to SAHS among Indigenous Australians (see, Booth and Carroll, 2005; Crossley and Kennedy,

[2] Despite the widely cited adverse effects on the Indigenous community of alcohol abuse, the labour market implications of this factor have received little systematic analysis. An exception to this is Hunter and Daly (2008), who show that, compared with a reference group who 'never drank alcohol', participation among Indigenous females declined by 10 percentage points in association with 'high-risk' alcohol use, but increased by 12.3 percentage points for having 'ever drank alcohol' (Hunter and Daly, 2008, 7).

2002; Sibthorpe *et al*., 2001), the data on this topic is considered sufficiently reliable for use in technical analyses (Ross, 2006, p. 68). After controlling for variables which interact with health and disability status, Ross (2006) finds that SAHS and disability status continue to have the expected coefficients in relation to labour force status. In particular, the probability of employment is shown to unambiguously decline in association with fair or poor SAHS, compared to a reference group with excellent health, and for a major disability (Ross, 2006, pp. 76-8). These findings are congruent with other studies (Biddle and Webster, 2007; Hunter and Gray, 2001).

Culture

The labour market implications of 'cultural attachment' among Indigenous people have also received attention in previous studies. One commonly used proxy for cultural attachment is the incidence of speaking an Indigenous language. This variable is generally found to be negatively correlated with employment, with one study finding a negative marginal effect of approximately 8 and 2.3 percentage points respectively for males and females (Hunter and Gray, 2001, pp. 121-2). Speaking an Indigenous language is also associated with a decrease in the probability of unemployment, but a statistically significant increase in CDEP participation and being not in the labour force (Hunter and Gray, 2001, pp. 121-2). That is, connection with the mainstream labour market, as either employed or unemployed, falls and is offset by a corresponding decline in participation and increase in CDEP employment. This may reflect a stronger preference for traditional activities outside the mainstream labour market and the more limited employment opportunities available to more traditional people (Altman *et al*., 2005, p. 21). However, as proficiency in an Indigenous language is more prevalent in very-remote areas, the statistical association between labour market status and speaking an Indigenous language may simply be driven by the low rates of employment in very remote areas. This issue is not easily resolved since available data are not disaggregated between remote and very remote areas.

Living in an 'ethnically mixed household', a household which includes a non-Indigenous occupant, is associated with a significant effect on labour force status. For example, one study finds this variable to be associated with an increase in the probability of employment of 21 and 14 percentage points for males and females respectively – a large effect roughly equivalent to that associated with completing year 12 relative to leaving school between years six and nine (Borland and Hunter, 2000, p. 136). These marginal effects may incorporate the positive labour market implications of greater exposure, interaction and integration with non-Indigenous society. As such, the mixed household variable may be a proxy for the positive labour force implications of not living in the culturally or geographically isolated urban 'ghettos' or remote communities to which Hughes (2007) refers. In addition, as non-Indigenous people are more likely to be employed than Indigenous people, the effect of living in a mixed household may reflect the correlation between the labour force statuses of partners (Miller and Volker, 1987; Miller, 1997). Therefore, there are a number of mechanisms through which living in a mixed household may be more conducive to employment for Indigenous people. However, as the number of mixed families is known to be inversely related with remoteness (Riley, 1994; Ross, 1999), failing to disaggregate between remote and very

remote areas, due to data limitations, again means the marginal effects on employment and CDEP participation of living in a mixed household may be overstated.

Identifying as of Torres Strait Islander (TSI) heritage, relative to identifying as Aboriginal, and having been removed from one's natural family are typically found to have negligible implications for labour force status (Hunter and Gray, 2001, p. 121).

Before moving on, it should be noted that care is needed in the interpretation of some of these 'cultural variables' as there is a danger of drawing misleading conclusions. For example, living in a mixed household is clearly a better proxy measure for an individual's association with non-Indigenous society, rather than their attachment to Indigenous culture.[3] This points to the complexity of interpreting the influence of 'culture' as the term is often loosely defined and consequently may 'ultimately mask more than it reveals' (Small *et al*., 2010, p. 14). Dealing with this complexity is not easy, especially given the diversity of definitions for 'culture', engagement with which is beyond the scope of this paper (for detailed discussion see Small *et al*., 2010). For the purposes of the following discussion, however, it will suffice to bear in mind the manifold intricacies of 'cultural influences' and to acknowledge a level of ambiguity in understanding how these interact with labour market outcomes.

These complexities aside, it is notable that most studies find a negative association between standard measures of cultural attachment and the probability of employment. Hunter and Gray (2001, p. 128) summarise this conclusion by stating that 'the variables that capture the access of an individual to traditional lifestyles, are associated with significant reductions in labour supply and declines in the desire to work in the mainstream labour market'. An exception to this finding is presented by Dockery (2009, pp. 19-20) who reaches a more nuanced conclusion, suggesting that in some instances stronger cultural attachment may be associated with improved labour market outcomes.

Crime

Several studies have investigated the implications of interaction with the criminal justice system on labour force status. Without exception these studies find that the incidence of arrest is associated with a negative marginal effect on the probability of employment, ranging from approximately 10 to 20 percentage points, and is considerably stronger for males (Borland and Hunter, 2000, p. 136; Hunter and Gray, 2001, pp. 122-3).

Housing Issues

The poor housing facilities available to a significant portion of the Indigenous population, particularly in remote areas, have also been widely cited as negatively interacting with employment outcomes (Hunter, 2004; Hunter and Daly, 2008; SCRGSP, 2009). However, this effect is yet to be demonstrated by a systematic analysis and the mechanism for this effect is not articulated beyond the conclusion that poor housing has 'negative consequences for population characteristics that

[3] Given this, it is perhaps more accurate to think of this set of variables under the broader notion 'socio-cultural factors' – reflecting the broad range of influences which will shape an individual's experiences, attitudes and preferences relating to the labour market.

directly impinge on labour supply and economic participation, notably health status and educational performance' (Taylor, 2008, p. 53).

The above discussion has identified the influence of a number of important factors on labour market status. In response to changes in these factors, employment and labour force participation typically move in the same direction, while CDEP participation and unemployment also move together, in the opposite direction to employment. The main exception is that for increasing remoteness, employment and unemployment decline, offset by increased CDEP participation, allowing labour supply to remain relatively constant. Notably, increased years of age and improvements in other variables related to human capital, such as education and health, are associated with increases in labour supply and the probability of employment. These results are consistent with the predications of the neoclassical model and, therefore, do not provide evidence in favour of the SLM theory's application to the Indigenous labour market.

The studies considered above cover a wide range of the factors thought likely to impact on the labour force status of Indigenous Australians. However, no study incorporates all these factors simultaneously. Further, there are a number of additional factors likely to influence labour force status which are not covered by previous analysis. The present paper contributes to this research by simultaneously considering a wider range of factors, including a number of 'new' variables relating to aspects of culture, health and housing quality. Following sections also expand on previous investigations of geographic factors by disaggregating the analysis between non-remote and remote areas. This approach facilitates a more delicate investigation of the factors associated with labour force status and allows clearer insights into the relevance of the contrasting neoclassical and SLM models.

3. Data and Methodology

The 2002 NATSISS

The 2002 NATSISS, released for full public access in 2005, was the second major national survey to have collected information specifically on Indigenous Australians. At the time of collection the survey was thought to represent one in 30 Indigenous people over 15 years of age (ABS, 2005a, p. 5). This sample size is argued to permit reasonably accurate inferences about the general population, as has been demonstrated by comparisons with other data sources. (For a review of issues relating to data collection and reliability see Biddle and Hunter [2006] or Stephens [2010]). For the purposes of this paper it suffices to say that, although some areas of concern have been identified, these are generally not thought to significantly compromise the reliability of information contained in the 2002 NATSISS. An exception to this is information on illicit drug use, which was considered to be downwardly biased to such an extent that it has been withheld, and that on alcohol use, which is publicly available and has been used by previous studies but is thought to understate the incidence of 'at risk' drinking by a factor of three or more (Chikritzhs and Brady, 2006, p. 245).

The 2002 NATSISS was based on information from 9359 individuals drawn from 5887 households. For this study's statistical analysis, individuals aged over 65 years of age, full-time students and those with missing information are excluded, reducing the sample to 7701 people, with 3275 males and 4426 females. Through application of the

unit weights provided in the CURF, the results presented below may be interpreted as reflective of the Indigenous population as a whole (Biddle and Hunter, 2006, p. 41).

Methodology

The main purpose of this paper's empirical analysis is to model the labour market categories of Indigenous Australians as a function of a range of exogenous variables covering geography, demographic characteristics, education, health, culture, crime and housing issues. The variables relating to these factors were selected on the basis of a specific to general modelling strategy (forward selection) governed by the economic issues being examined. The possible labour market outcomes considered are 'employed' (Empd), 'CDEP participant' (CDEP), 'unemployed' (Ue) and 'not in the labour force' (NILF). As the four dependent variables are categorical, rather than continuous or ordinal, multinomial logit regression is the most appropriate model for the analysis.[4]

The multinomial logit coefficients for a particular labour force category relate to the 'log odds ratio', where the odds ratio is the probability of being in that category divided by the probability of being in the reference group, assumed here to be 'employed'. These coefficients may be used to compute probabilities using:

$$\text{Probability } (Y_i = j) = \frac{e^{\beta_j' \mathbf{x}_i}}{\sum_{k=1}^{k=4} e^{\beta_k' \mathbf{x}_i}}$$

where βj is a vector of coefficients relating the variables contained in the vector X to the log odds ratio for the j^{th} labour force category relative to the reference labour force category of the employed.

Given the complexity of interpreting the log odds ratios, it is standard to report the variable's marginal effects rather than their coefficients.[5] The marginal effects for each variable (e.g. married) are found by subtracting the probability of the base case (e.g. not married) from the probabilities found for each coefficient (e.g. married). In discussion of each factor's marginal effects, reference to their statistical significance refers to that of the relevant coefficient.

The variables incorporated in this analysis include those reviewed in previous studies (region of residence, age, family characteristics, education, health, culture and crime) and a number of 'new' variables, not incorporated in previous studies for Indigenous Australians. These 'new' variables cover factors relating to health (smoking and alcohol use), culture (attending cultural events and living in homelands) and housing issues.[6] The housing issues covered are living in a house which is: 'overcrowded' (crowding), 'has not had repairs in the last 12 months' (no repairs), 'lacks key household facilities' (facilities) or 'has major structural problems' (structural problems). Details relating to the construction of each variable are contained in appendix A, while their descriptive statistics are presented in Stephens (2010).

[4] Using the multinomial logit regression implicitly requires the assumption of the Independence of Irrelevant Alternatives (IIA). If this assumption is violated, the validity of the regression's results would be undermined.

[5] Interested readers may obtain details on these coefficients and their associated test-statistics by contacting the author.

[6] While Hunter and Daly (2008) include variables for alcohol use, their analysis only covers labour supply among females.

4. Empirical Results

Determinants of Labour Force Status with the Full Sample

Before discussing particular estimates, it is informative to consider whether the variables sets used in this model are independently significant by conducting likelihood ratio tests. The results of this test, presented in Stephens (2010), reveal that all the variables considered in the expanded model, including those original to this study, enhance the fit of the model.

The marginal effects computed from the estimates are listed in tables 1 and 2 for males and females respectively. These results are largely consistent with those found in the studies covered in section 2. In particular, variables related to geography, age, family characteristics, SAHS, disability status, speaking an Indigenous language, living in a mixed household, having been removed from family, identify as TSI and crime, yield results which closely mirror those found by the studies reviewed above. Accordingly, the following discussion has been restricted to discussing factors for which the present results are incongruent with previous studies and to analysis of results relating to this study's new variables.

Table 1 - Marginal Effects of Selected Characteristics on LFS, Males

	NILF	*Ue*	*CDEP*	*Empd*
Base case	0.232	0.166	0.173	0.429
Geography				
Inner regional	-0.013	0.016	0.078	-0.081
Outer regional	0.021	0.028	0.026	-0.075
Remote	-0.082	-0.127	0.381	-0.173
Age				
Age 25-34	0.012	-0.037	-0.091	0.117
Age 35-44	-0.015	-0.045	-0.097	0.157
Age 45-54	0.046	-0.096	-0.096	0.146
Age 55-64	0.228	-0.131	-0.127	0.030
Family				
Married	-0.135	-0.019	-0.018	0.172
One dependant	-0.141	0.038	0.336	-0.232
Two or three dependants	-0.141	0.038	0.336	-0.232
Four or more dependants	-0.025	0.048	0.174	-0.197
Education				
≤year 9	0.173	-0.025	0.013	-0.161
Year 11 (n.s.)	-0.036	-0.034	0.077	-0.007
Year 12	-0.101	-0.024	0.065	0.061
Certificate	-0.033	-0.081	-0.036	0.150
Degree or diploma	-0.051	0.005	-0.104	0.150
English difficulty	0.116	0.023	0.007	-0.145
Health				
Smoker	0.061	0.049	0.011	-0.121
Disability	0.154	0.000	-0.021	-0.133
Good SAHS	0.029	-0.042	0.017	-0.004
Fair SAHS	0.159	-0.007	-0.016	-0.136
Poor SAHS	0.443	-0.132	-0.017	-0.294
No alcohol use	0.006	0.075	0.026	-0.107
High risk alcohol use	-0.066	0.009	0.073	-0.016

Table 1 - Marginal Effects of Selected Characteristics on LFS, Males (continued)

	NILF	*Ue*	*CDEP*	*Empd*
Cultural				
Homelands	-0.017	0.023	0.076	-0.082
Mixed household	-0.043	-0.060	-0.095	0.198
Cultural event	-0.103	-0.055	0.360	-0.203
Indigenous language	0.177	-0.032	0.046	-0.191
Removed	-0.051	0.104	-0.003	-0.049
TSI (n.s.)	-0.080	0.066	0.031	-0.017
Crime				
Arrested	0.003	0.155	0.023	-0.181
Housing				
Crowding	0.071	0.068	-0.057	-0.082
No repairs	-0.002	0.002	0.053	-0.054
Facilities	0.012	-0.066	0.098	-0.044
Structural problems	0.055	0.055	-0.036	-0.074

Note: The base case refers to a hypothetical male with mean characteristics. The marginal effects show the change in the probability of being in the respective labour force category associated with the respective explanatory variable. As the marginal effects in each row sum to zero, if any marginal effect is based on a statistically significant coefficient the other marginal effects in that row are also likely to be statistically significant (Hunter and Gray, 1999: 17). Where all the coefficients of a particular variable are statistically insignificant at the 10 per cent significance level this is indicted by 'n.s.' in parentheses. The sample size is 3275. *Source:* ABS (2005b).

Table 2 - Marginal Effect of Selected Characteristics on LFS, Females

	NILF	*Ue*	*CDEP*	*Empd*
Base case	0.472	0.104	0.099	0.325
Geography				
Inner regional	0.015	0.033	0.034	-0.082
Outer regional	-0.015	0.006	0.069	-0.060
Remote	-0.231	-0.047	0.391	-0.113
Age				
Age 25-34	-0.029	-0.042	-0.010	0.080
Age 35-44	-0.148	-0.065	-0.016	0.229
Age 45-54	-0.087	-0.073	-0.026	0.186
Age 45-64	0.124	-0.103	-0.052	0.031
Family				
Married	0.013	-0.038	0.025	0.000
One dependant	0.126	-0.035	-0.019	-0.072
Two or three dependants	-0.092	0.056	0.232	-0.196
Four or more dependants	0.025	0.068	0.133	-0.226
Education				
≤year 9	0.128	-0.014	-0.019	-0.096
Year 11 (n.s.)	-0.022	-0.004	-0.007	0.034
Year 12	-0.258	0.128	0.133	-0.003
Certificate	-0.156	-0.031	-0.018	0.205
Degree or diploma	-0.317	-0.055	-0.049	0.421
English difficulty	0.080	0.023	0.009	-0.112

Table 2 - Marginal Effect of Selected Characteristics on LFS, Females (continued)

	NILF	*Ue*	*CDEP*	*Empd*
Health				
Smoker	0.023	0.040	0.013	-0.076
Disability	0.085	-0.002	0.015	-0.098
Good SAHS	0.071	0.000	0.012	-0.082
Fair SAHS	0.121	0.037	-0.027	-0.130
Poor SAHS	0.310	-0.037	-0.044	-0.229
No alcohol use	0.069	-0.009	0.031	-0.091
High risk alcohol use	-0.008	0.026	0.046	-0.064
Cultural				
Homelands	-0.043	-0.023	0.028	0.038
Mixed household	-0.159	-0.002	-0.031	0.193
Cultural event	-0.103	-0.015	0.114	0.003
Indigenous language	0.092	-0.014	0.023	-0.101
Removed	0.005	0.036	-0.001	-0.039
TSI (n.s.)	0.027	0.008	0.021	-0.056
Crime				
Arrested	0.132	0.049	-0.010	-0.171
Housing				
Crowding	0.043	0.011	0.017	-0.071
No repairs (n.s.)	0.029	-0.020	-0.010	0.001
Facilities (n.s.)	0.062	-0.015	0.010	-0.057
Structural problems	0.006	0.019	0.006	-0.031

Note: The base case refers to an Indigenous female with mean characteristics. The sample size is 4426. *Source:* ABS (2005b).

The marginal effects associated with the education variables presented in table 1 and 2 are in general weaker than those in previous studies. For example, this paper's analysis reveals that completing school has a marginal effect on the probability of employment of only 6.1 percentage points for males and is associated with a 0.3 percentage point decline in the probability of employment for females. That is, relative to completing year 10, completing year 12 has near no effect on the employment probability among females and a small effect for males. This contrasts with the studies reviewed above, which found completing year 12 to be associated with much larger marginal effects of 9.8 to 28.6 percentage points (Biddle and Webster, 2007; Borland and Hunter, 2000; Hunter and Gray, 2001).

The contrast between the present study and those previously reviewed appears to be driven by the use of contrasting reference groups: while this study uses a reference group which has completed year 10 but with no further qualifications, other studies use a more extreme reference group which either left school between years six to nine (Hunter and Gray, 2001; Borland and Hunter, 2000) or an unbounded group with less than year nine or 10 education (Biddle and Webster, 2007; Hunter and Daly, 2008). It is arguable that using these low education levels as a reference group unduly inflates the effect of education variables, since failing to complete compulsory education may be correlated with other factors, such as social marginalisation or family

dysfunction, which are likely to have an independent negative effect on the probability of employment. Despite this observation, it should be noted that the paper's results support the conclusion that completing non-school qualifications has a large positive effect on the probability of employment, particularly among Indigenous females.

Turning to the new variables, starting with alcohol use, relative to the omitted category of low or moderate alcohol consumption, abstinence from alcohol is associated with a decline in employment for both genders, perhaps a surprising result. Relative to the same reference group, high alcohol use among females was associated with a negative marginal effect on the probability of employment of 6.4 percentage points, but had no statistically significant relationship with labour force status among males. Perhaps contrary to popular perception, this result suggests that alcohol abuse among Indigenous Australians has a weaker effect on the probability of employment than among other populations for which similar analyses have been conducted (for example see MacDonald and Shields, [2004]). However, it is important to note the significant caveat that, as the 2002 NATSISS excludes residents of non-private dwellings (who are less likely to be employed and more likely to abuse alcohol [Chikritzhs and Brady, 2006, p. 243]) the results presented here may understate the association between alcohol abuse and the labour force statuses of Indigenous Australians.

Identifying as a smoker is associated with a negative marginal effect on the probability of employment of 12.1 and 7.6 percentage points for males and females, respectively. This is a surprisingly large effect, for example, similar to the marginal effect of having a disability. As the model used here includes measures for health status, there seems to be little scope for smoking's negative impact on employment probability to be caused by smoking's health implications. One possibility then, is that, given the documented correlation between smoking and illicit drug abuse (Sullivan and Covey, 2002, p. 704), the smoking variable may capture some of the unmeasured negative labour market implications associated with illicit drug use.

Both the new cultural variables included in this study tend to have a statistically significant relationship with labour force status. In particular, having attended a cultural event in the last 12 months is associated with a 20.3 percentage point decline in the probability of employment for males, but no statistically significant relationship with labour force status among females. The decline in employment among males is primarily driven by a 36 percentage point increase in CDEP participation. As attendance and participation in cultural activities may have been counted as CDEP work (Hudson, 2008, p. 2), it is likely that this result reflects the fact that attending cultural events and CDEP participation are jointly determined.

Among males, 'living in homelands' has a negative marginal effect on the probability of employment of 8.2 percentage points, with a corresponding increase in CDEP participation. In contrast, for females, this factor has a small positive effect on both employment and CDEP participation. These results are of interest in part because of the prognosis presented by some that a major contributor to the poor employment outcomes among Indigenous people is their relatively low proclivity to leave their 'homelands' and relocate for employment purposes (Hughes, 2007). Although the results presented here do indicate that living in 'homelands' has a negative association with employment for males, if not for females, the strength of this relationship is not

so strong as to suggest that the choice to live in one's 'homelands' is, after controlling for personal characteristics, associated with a major labour market penalty.

Of the housing quality variables, only 'crowding' and 'structural problems' consistently have a statistically significant association with labour force status among males and females. Both of these are associated with a decline in employment and labour force participation, an effect which is strongest for males. As noted in section 2, a number of studies have suggested that poor housing may affect Indigenous Australian's labour market outcomes through its negative implications for health and educational attainment. However, as the present study controls for education and health, these results imply that crowding and structural problems may have a direct negative impact on employment prospects.[7] This conclusion is congruent with prior assumptions and highlights the potential benefits associated with the recent policy focus on improving housing facilities (Addressing Disadvantage in Remote Australia, 2009).

The results presented in this section highlight the wide range of variables which have a statistically significant relationship with the probability of employment. For both males and females some of the strongest positive marginal effects on the probability of employment, presented in tables 1 and 2, include being aged 35 to 44 and living in a mixed household. Completing a certificate, degree or diploma also has a strong positive effect on the probability of employment, particularly for females. The variables with the strongest negative impact include having two or three dependants, four or more dependants, poor SAHS and having been arrested. The analysis to this point, therefore, suggests that initiatives to increase employment among Indigenous people are well served by considering not only those factors related to human capital, such as education and health, but also a wide range of socio-cultural variables, such as the implications of dependants and interactions with the criminal justice system. However, a significant weakness of the above discussion, and much prior research on this topic, is that considering the Indigenous population as a whole fails to account for the heterogeneity of this community and therefore may yield misleading results. According to a range of indicators one of the starkest divisions among Indigenous people is the divide between those living in non-remote and remote areas (Gray and Chapman, 2006, p. 118). By disaggregating the analysis between these regions the following section reveals a number of significant and hitherto unrecognised trends.

Determinants of Labour Force Status in Non-Remote and Remote areas

The only previous study to consider inter-regional variations in the determinants of labour force status is Hunter (2004). However, as Hunter (2004) utilised the less detailed Census data, the present study is able to offer greater detail and clarity on a number of issues, particularly in relation to culture. In the interest of brevity, only those results which reveal significant variations between non-remote and remote areas are discussed below, meaning the variable sets for family characteristics and housing issues are omitted.

[7] While it is possible that this result reflects the endogenity of housing quality to employment status, this is unlikely in the present context given that only 25 per cent of Indigenous people live in owner-occupied homes (Biddle, 2008, p. 10) meaning housing quality for the majority of the Indigenous community is likely to be independent of the individual's employment status and finances.

Table 3 - Marginal Effects of Age in Non-Remote and Remote Areas

	Non-Remote				*Remote*			
	NILF	*Ue*	*CDEP*	*Empd*	*NILF*	*Ue*	*CDEP*	*Empd*
Males								
Base case	0.223	0.202	0.066	0.509	0.255	0.075	0.448	0.223
Age 25-34	0.029	-0.052	-0.043	0.066	0.001	-0.009	-0.182	0.190
Age 35-44	0.021	-0.073	-0.050	0.102	-0.049	-0.003	-0.165	0.217
Age 45-54	0.108	-0.118	-0.051	0.061	-0.022	-0.045	-0.186	0.254
Age 55-64	0.266	-0.162	-0.054	-0.050	0.190	-0.055	-0.296	0.161
Females								
Base case	0.472	0.127	0.030	0.371	0.470	0.044	0.285	0.201
Age 25-34	-0.124	-0.060	-0.003	0.188	-0.233	-0.031	-0.061	0.326
Age 35-44	-0.029	-0.090	-0.014	0.132	-0.087	-0.038	-0.086	0.211
Age 45-54	--	--	--	--	-0.033	-0.042	-0.105	0.181
Age 55-64	-0.030	-0.037	-0.001	0.067	-0.114	-0.011	0.028	0.096

Note: The base case refers to a hypothetical person with the mean characteristics which prevail in non-remote and remote areas, respectively. The base case probabilities also apply to tables 4-7. For males the sample size was 1755 and 1520 for non-remote and remote areas, respectively. For females the corresponding sample sizes were 2499 and 1927. *Source:* ABS (2005b).

The results presented in table 3 reveal that for both genders the probability of employment increases more strongly with age in remote areas – a result consistent with previous findings (Hunter, 2004, p. 71). This difference is driven by the particularly low rates of employment among young Indigenous people in remote areas. It is also notable that while increased employment with age in non-remote areas is accompanied by a significant decline in unemployment, in remote areas it is CDEP participation which declines most strongly. This result is driven by the significant presence of young people among the unemployed in non-remote areas compared with their heavy reliance on CDEP in remote areas.

Table 4 - Marginal Effects of Education and English Skills in Non-Remote and Remote Areas

	Non-Remote				*Remote*			
	NILF	*Ue*	*CDEP*	*Empd*	*NILF*	*Ue*	*CDEP*	*Empd*
Males								
≤year 9	0.246	-0.051	0.006	-0.201	0.069	0.009	0.003	-0.081
Year 11 (n.s.)	-0.010	-0.056	0.052	0.014 (n.s.)	-0.086	0.014	0.072	-0.001
Year 12	-0.135	-0.064	0.243	-0.043 (n.s.)	-0.076	0.210	-0.170	0.036
Certificate	0.017	-0.113	-0.008	0.104	-0.137	0.005	-0.101	0.233
Degree or diploma (n.s.)	-0.039	-0.034	-0.044	0.118 (n.s.)	0.028	0.056	-0.169	0.085
English difficulty	0.186	0.031	0.016	-0.234 (n.s.)	0.014	0.009	-0.047	0.024
Females								
≤year 9	0.185	-0.046	-0.012	-0.127	0.227	-0.019	-0.100	-0.108
Year 11 (n.s.)	-0.003	-0.001	0.006	-0.002	0.008	-0.024	-0.040	0.056
Year 12	-0.220	0.099	0.055	0.067	-0.134	0.169	-0.047	0.012
Certificate	-0.071	0.012	0.001	0.057	-0.134	-0.027	-0.058	0.219
Degree or diploma	-0.330	-0.091	-0.027	0.448	-0.393	-0.027	-0.165	0.585
English difficulty	0.072	0.069	-0.003	-0.138 (n.s)	-0.013	0.009	0.005	-0.001

Source: ABS (2005b).

The results for education and English skills presented in table 4 reveal that these variables generally have significantly stronger effects on the probability of employment in non-remote areas. For example, in non-remote areas, leaving school before completing year 10 and English difficulty have negative marginal effects on the probability of employment of 24.6 and 18.6 percentage points respectively among males; however, in remote areas, leaving school early had only a small effect on the probability of employment (8.1 percentage points), while English difficulty did not have a statistically significant relationship with any particular labour market outcome. Likewise, education tends to be associated with stronger effects on labour force participation in non-remote areas. The only exceptions to this trend were that for males the completion of a certificate was associated with a significantly stronger positive effect on the probability of employment in remote areas than in non-remote areas, while for females all non-school education variables have stronger effects in remote areas.

The regional variations in the effects of education shown here conflict with the findings of Hunter (2004), cited in section 2, but are consistent with those presented by Biddle (2006). Notably, where Hunter (2004) relies on the 2001 Census, both Biddle (2006) and the present study make use of the 2002 NATSISS. This suggests that the discrepancy between these studies may be explicable by the less detailed nature of the Census data compared with the 2002 NATSISS.

Table 5 - Marginal Effects of Health Factors in Non-Remote and Remote Areas

	Non-Remote				*Remote*			
	NILF	*Ue*	*CDEP*	*Empd*	*NILF*	*Ue*	*CDEP*	*Empd*
Males								
Smoker	0.068	0.054	0.012	-0.133	0.027	0.028	0.017	-0.072
Disability	0.188	-0.003	-0.021	-0.163	0.114	-0.005	-0.025	-0.084
Good SAHS	0.069	-0.066	0.006	-0.009 (n.s.)	-0.015	0.009	0.025	-0.019
Fair SAHS	0.214	-0.017	-0.024	-0.172 (n.s.)	-0.008	0.028	0.016	-0.036
Poor SAHS	0.557	-0.176	-0.040	-0.341	0.233	-0.008	-0.062	-0.163
No alcohol	-0.014	0.106	0.025	-0.118	0.016	0.027	0.022	-0.064
High alcohol	-0.041	0.015	0.044	-0.018	-0.108	0.010	0.073	0.025
Females								
Smoker	0.047	0.082	-0.004	-0.124	-0.001	0.023	0.059	-0.081
Disability	0.126	0.032	-0.004	-0.154	0.024	0.000	0.079	-0.102
Good SAHS	0.068	0.039	-0.003	-0.104 (n.s.)	0.023	0.007	0.001	-0.031
Fair SAHS	0.146	-0.006	-0.014	-0.126	0.014	0.086	-0.084	-0.016
Poor SAHS	0.387	-0.082	-0.019	-0.286	0.212	0.012	-0.114	-0.110
No alcohol	0.083	0.036	-0.012	-0.106	0.000	-0.007	0.113	-0.106
High alcohol	-0.026	0.102	-0.009	-0.067	-0.099	-0.003	0.199	-0.097

Source: ABS (2005b).

Variables related to health, covered in table 5, tend to have the same sign in both areas. However, as is the case with education, the magnitudes of these effects on the probability of employment are weaker in remote areas. For example, among males the fall in employment associated with smoking, having a disability, poor SAHS and not drinking, is roughly twice as large in non-remote areas. Similarly, the decline in labour market participation associated with these factors is also stronger in non-remote areas for both genders.

Table 6 - Marginal Effects of Cultural Factors in Non-Remote and Remote Areas

	Non-Remote				*Remote*			
	NILF	*Ue*	*CDEP*	*Empd*	*NILF*	*Ue*	*CDEP*	*Empd*
Males								
Homelands	-0.019	0.055	0.033	-0.068	-0.042	-0.006	0.118	-0.069
Mixed household	-0.061	-0.085	-0.032	0.178	0.014	0.005	-0.320	0.302
Cultural event	-0.052	-0.076	0.270	-0.141	-0.144	-0.017	0.249	-0.088
Indigenous language	0.173	-0.005	-0.001	-0.167	0.085	-0.040	0.090	-0.136
Removed	-0.022	0.148	-0.027	-0.099	-0.050	-0.025	0.041	0.034
TSI	-0.087	0.200	-0.056	-0.056	-0.095	-0.070	0.218	-0.053
Females								
Homelands	-0.169	0.001	0.014	0.154	0.007	-0.024	0.032	-0.016
Mixed household	-0.163	-0.033	-0.018	0.215	-0.145	0.000	-0.055	0.200
Cultural event	-0.125	-0.014	0.190	-0.051	-0.079	0.001	0.159	-0.081
Indigenous language	-0.009	-0.034	-0.012	0.055	0.075	-0.001	0.025	-0.098
Removed	-0.003	0.073	-0.008	-0.062 (n.s.)	-0.110	-0.018	0.110	0.018
TSI	--	--	--	--	-0.065	-0.015	0.156	-0.076

Source: ABS (2005b).

For Indigenous males, of the cultural factors shown in table 6, the effect associated with living in a 'mixed household' differs most significantly between non-remote and remote areas. The marginal effect of this variable is almost twice as strong in relation to employment probability and ten times as strong in relation to CDEP participation in remote areas. A number of mechanisms were suggested in section 2 through which living in a mixed household may impact positively on the probability of employment. However, it was also noted that the association between labour force status and living in a mixed household could be driven by the aggregation of remote and very remote area data, since both mixed households and employment rates are negatively correlated with remoteness. The results presented here are useful in determining the relative strength of these alternate hypotheses.

In particular, as living in a mixed household is found here to have a significantly stronger effect in remote areas it is possible that the marginal effect of this variable is inflated by its unmeasured correlation with remoteness. However, it is also possible that the labour market benefits of living in a mixed household are simply stronger in remote areas. Moreover, as the discussed data limitations do not apply to non-remote areas, the fact that living in a mixed household continues to be associated with increased employment in these areas demonstrates that this factor does have positive labour market implications even where data limitations are not an issue.

Importantly, if living in a mixed household can be taken as a proxy for greater integration with non-Indigenous society, then this result suggests that such integration is associated with a higher probability of employment. However, the mechanism for this increase is unclear: as noted in section 2, there are a number of reasons why living in a mixed household may be more conducive to being employed.

It was also noted in section 2 that, as for mixed households, the labour market effects associated with speaking an Indigenous language may reflect the correlation between this factor and unmeasured remoteness. However, as the negative effect on employment for males of speaking an Indigenous language is actually stronger in non-

remote areas, it seems that this measure for cultural attachment is also associated with negative labour market implications, at least for males, distinct from complications relating to unmeasured correlation with remoteness.

Importantly, by demonstrating that these cultural variables continue to be associated with negative implications for the probability of employment even where the analysis is disaggregated between non-remote and remote areas, these results confirm the conclusion reached by previous studies, such as Hunter and Gray (2001) and Borland and Hunter (2000), that stronger cultural attachment is associated with lower rates of employment.

Table 7 - Marginal Effects of Arrest in Non-Remote and Remote Areas

	Non-Remote				*Remote*			
	NILF	*Ue*	*CDEP*	*Empd*	*NILF*	*Ue*	*CDEP*	*Empd*
Males								
Arrested	0.019	0.190	-0.011	-0.198	-0.014	0.066	0.070	-0.123
Females								
Arrested	0.078	0.144	-0.007	-0.214	0.160	0.000	-0.090	-0.070

Source: ABS (2005b).

Table 7 reveals that in remote areas, as with education and health, arrest has a significantly weaker effect on employment for both genders than in non-remote areas. In both regions, labour force participation rates are found to be relatively insensitive to arrest for males, as was the case when the sample was considered in aggregate; however, for females labour market participation rates fall significantly.

An interesting trend revealed by this section is the apparent role of the CDEP as a substitute to unemployment in remote areas. As observed by Biddle and Webster (2007, p. 31):

> "Those who live in Remote or Very Remote regions are less likely to be unemployed than those in major cities or regional areas... [meaning] that in these areas the CDEP scheme appears to be providing an alternative to being unemployed."

Through the disaggregated analysis of this section, it is possible to confirm that where the CDEP is widely available (i.e. remote areas) it is utilised by individuals who, given their personal characteristics, otherwise are more likely to be unemployed than employed. That is, factors which increase unemployment in non-remote areas, such as having little education, significantly increase CDEP participation in remote areas and have only a minor effect on unemployment. This conclusion may have implications for ongoing policy initiatives to dismantle the old CDEP system.[8] In

[8] Since July 2009 the CDEP is no longer available to residents of non-remote locations 'with established economies' (CDEP, 2010). Further, existing CDEP participants in remote areas will only be eligible to receive CDEP wages until April 2012, after which they will be eligible to transition to CDEP income support, while current participants who have joined since 2009 are presently paid CDEP income support rather than wages (CDEP, 2010).

particular, the results suggest that as the CDEP program is scaled back in remote areas, the formerly CDEP employed may predominantly transition to unemployment rather than mainstream employment. That is, given the personal characteristics of remote area CDEP recipients, even if these individuals relocated to non-remote areas, they may reasonably be expected to disproportionately join the unemployed. Of course, this description is based on the current static analysis: if the employment prospects of Indigenous people markedly improved this equation would change, though such a development may be unlikely given recent experiences (Altman *et al*., 2008, p. 6).

5. A Segmented Labour Market?

The above analysis has indicated that the probability of employment among Indigenous Australians responds more strongly to standard measures of human capital, such as education and health, in non-remote areas than remote areas. This is significant as it implies that the labour market conditions for many Indigenous people in remote areas are in keeping with SLM theory's description of a secondary labour market with minimal returns to standard measures of human capital. Therefore, the results presented above are indicative of a segmented labour market for Indigenous Australians. This conclusion raises an important question, namely: what are the causes of this apparent segmentation?

Part of the answer to this question lies with geographic issues. In particular, it seems that Indigenous people in non-remote areas are more likely to have access to the primary labour market, as reflected by the relatively strong returns to human capital enjoyed by this group. Conversely, the lower returns to human capital in remote areas are indicative of the secondary market with its low rates of employment. However, it does not follow from this that all Indigenous Australians in remote areas are therefore operating in the secondary market or that all Indigenous people in non-remote areas will have access to the primary market. Instead, it is the contention of this paper that the more salient factor in creating this SLM is the complex role of socio-cultural factors which shape an individual's attitudes and preferences in relation to work. While the implication of this interpretation is to emphasise the supply side of the equation, it is also possible that these cultural factors affect the demand for labour, particularly if employers use an individual's apparent cultural attachment as a screening device on the assumption that such traits are inconsistent with good work habits.

This conclusion is supported by the results presented in this, and other, papers indicating a strong negative association between measures for 'cultural attachment', such as speaking an Indigenous language or living in a mixed household, and the probability of employment. Importantly, all the variables used to measure cultural attachment are significantly more prevalent in remote areas than non-remote areas.[9] Accordingly, it is arguable that some of the practices, preferences and attitudes towards work associated with strong cultural attachment contribute to the segmentation of the labour market, where the particularly low rates of return on human capital in remote

[9] For example, in non-remote areas only 9.5 per cent of males and 8.4 per cent of females speak an Indigenous language while the corresponding figure for both genders in remote areas is approximately 53 per cent (other examples in Stephens, 2010, pp. 39-42).

areas are driven by the higher prevalence of cultural attachment in these regions. That is, labour markets, in both non-remote and remote areas, appear to be segmented between those individuals with strong 'cultural attachment' and those who do not. In particular, those with relatively strong cultural links to Indigenous society and/or a weaker connection with non-Indigenous society seem to be concentrated in the secondary labour market. Significantly, it appears that the lower rates of employment experienced by Indigenous people in the secondary labour market have been largely offset by higher CDEP participation, reflecting the CDEP's focus on providing culturally appropriate employment accessible to Indigenous people unable to obtain employment in the primary labour market.

An alternative to the interpretation offered here is that geographic factors are the primary cause of the observed segmentation because of the weak demand for labour in remote areas. From this standpoint, it could be argued that cultural factors are merely incidentally correlated with the low demand for labour in remote areas. The evidence, however, does not support this conclusion. In particular, it has been found through the paper's regionally disaggregated analysis that cultural factors exert a strong negative influence on employment probability in both remote and non-remote areas, implying that some Indigenous people in non-remote areas are also confined to the secondary labour market. This segmentation is simply less evident since relatively few Indigenous people in non-remote areas have such strong cultural connections. Therefore, while this paper notes the relevance of geographic factors, it sees them as secondary to the dominant influence of socio-cultural influences. However, it should be acknowledged that a number of other factors may also contribute to this segmentation process. For example, in addition to the undoubted role of geographic issues, discrimination is also highlighted in traditional SLM literature and has been identified by previous studies as likely to adversely affect labour market outcome among Indigenous Australians (Hunter 2004, p. 78). Unfortunately, the 2002 NATSISS lacks a non-Indigenous sample meaning the present paper is unable to engage with this possibility.

Looking beyond the confines of the evidence presented here, the conclusion that the labour market for Indigenous Australians is segmented and that such segmentation is driven by strong socio-cultural influences, has considerable intuitive appeal. In particular, despite a long history of government programs aimed at increasing Indigenous employment through human capital augmentation,[10] the proportion of Indigenous people in employment has actually declined between 1971 and 2006 (Altman *et al*., 2008, p. 6). This experience is consistent with SLM theory's prediction of the impotence of policy measures which focus on human capital alone as a means to boost the employment prospects of disadvantaged groups. Moreover, this situation bears striking resemblance to that of some urban centres in the United States where employment outcomes have remained intractably poor despite considerable government welfare expenditures and training programs (Leontaridi, 2001, p. 65) – a reality that provided the impetus for the development of modern SLM theory.

[10] The Hawke Government's 1987 'Aboriginal Employment Development Policy', the Howard Government's agenda of 'practical reconciliation' and the Rudd Government's 'Closing the Gap' program all included the objective of reducing or eliminating the employment gap between Indigenous and non-Indigenous people.

The apparent congruence between SLM theory's predictions and the evidence presented here has implications for ongoing attempts to enhance employment outcomes among Indigenous Australians. In particular, the conclusion that some forms of human capital in remote areas yield only limited gains in employment prospects points to the futility of focusing on one set of favoured issues to the exclusion of engagement with the complex socio-cultural context in which some Indigenous people operate. Accordingly, in addition to focusing on outcomes in education and health, it may be beneficial to consider how Indigenous people can be given greater opportunities for positive engagement with non-Indigenous society and better access to the social and cultural institutions which facilitate improved employment outcomes. Likewise, governments should continue to focus on ensuring that policies, particularly welfare policies, do not adversely affect community preferences and expectations in relation to employment. Further, it may be necessary for employers to place greater emphasis on promoting access to primary market jobs for culturally connected Indigenous people. This would include measures such as more flexible and targeted recruitment and employment strategies, ongoing mentoring, increased opportunities for career development and greater sensitivity towards family and cultural obligations (Tiplady and Barclay, 2007). Governments could encourage employers in this direction by providing appropriate incentives or establishing mandatory quotas for Indigenous employees in some sectors of the primary market.

6. Conclusion

This paper makes several key contributions. By updating previous research and incorporating a number of 'new' variables, it confirms the importance of a wide array of geographic, demographic, cultural and human capital related factors as determinants of labour supply and employment prospects among Indigenous Australians. Importantly, this analysis highlights the particularly strong association between employment and a number of socio-cultural factors, such as having dependants, speaking an Indigenous language, living in a mixed household and having been arrested. This points to the complex reality of Indigenous employment disadvantage and should be heeded as caution against 'silver bullet' solutions of focusing on one narrow set of favoured issues.

The paper's disaggregation of its analysis between non-remote and remote areas also demonstrated previously unidentified inter-regional variations in the determinants of labour force status. Among other things, the results of this analysis implied that where the CDEP is widely available (i.e. remote areas) it acts as a labour market substitute to unemployment, rather than mainstream employment, a conclusion which suggests that ongoing reductions to the CDEP's availability may lead to a stronger increase in unemployment, rather than employment.

Finally, consideration was made of the applicability of the SLM model to the labour market for Indigenous Australians. In this regard, the evidence of relatively low returns to human capital in remote areas was found to be highly indicative of the characteristics associated with the SLM theory. The argument was made that this segmentation was driven by the complex role of socio-cultural factors, with Indigenous people who show signs of strong cultural connectedness apparently less likely to gain access to the primary labour market and instead largely relegated to a secondary market

with low rates of mainstream employment. This conclusion further emphasises the difficulty of driving enhanced employment outcomes across the Indigenous community through a focus on human capital to the exclusion of other socio-cultural factors.

The analysis presented here suggests that further research on the relevance of SLM theory to the labour market for Indigenous Australians is warranted. In particular, research focused on the relationship between standard measures of human capital and income among employed Indigenous people would be particularly useful. Existing evidence, presented by Biddle (2006), does indicate contrasts between the returns to education in non-remote and remote areas in terms of income, but no clear pattern emerges. Accordingly, further examination of these issues with particular reference to SLM theory may be of use.

Appendix A

Description of Explanatory Variables for LFS Models

Variable	*Description (all variables are dichotomous)*
Geography	
Major cities	omitted category, residence in a major city
Inner regional	resident of inner regional area
Outer regional	resident of outer regional area
Remote	resident of remote or very remote area
Age	
Age 15-24	omitted category, for those aged 15 to 24
Age 25-34	those aged 25 to 34 years
Age 35-44	those aged 35 to 44 years
Age 45-54	those aged 45 to 54 years
Age 55-64	those aged 55 to 64 years
Family	
Unmarried	omitted category, for a social marital status of unmarried
Married	for a social marital status of married
No dependants	omitted category, for those with no dependants
One dependant	for those with one dependant
Two or three dependants	for those with two or three dependants
Four or more dependants	for those with four or more dependants
Education	
≤year 9	highest educational attainment year 9 or lower
Year 10	omitted category, highest educational attainment year 10
Year 11	highest educational attainment year 11
Year 12	highest educational attainment year 12
Certificate	highest educational attainment a certificate
Degree or diploma	highest educational attainment a diploma, degree or higher
No English difficulty	omitted category, no difficulty in communicating in English
English difficulty	difficulty in communicating in English
Health	
Non-smoker	omitted category, does not smoke
Smoker	occasional or regular smoker
No disability	omitted category, no disability reported
Disability	reported a disability
Excellent/very good SAHS	omitted category, reported ‘excellent’ or ‘very good’ SAHS
Good SAHS	reported ‘good’ SAHS
Fair SAHS	reported ‘good’ SAHS

Appendix A (continued)

Description of Explanatory Variables for LFS Models (continued)

Variable	*Description (all variables are dichotomous)*
Health (continued)	
Poor SAHS	reported 'good' SAHS
No alcohol	reported no alcohol consumption in the last two weeks
Low/ medium alcohol	omitted category, 'low' or 'medium' risk alcohol consumption in the last two weeks
High alcohol	reported 'high' risk alcohol consumption in the last two weeks
Cultural factors	
Not live in homelands	omitted category, where the individual does not live on homelands
Homelands	Where the individual lives on their homelands
Not mixed household	omitted category, where all household occupants are identified as Indigenous
Mixed household	at least one household occupant is non-Indigenous
No cultural event	omitted category, has not attended a cultural event in the last 12 months
Cultural event	has attended a cultural event
No Indigenous language	omitted category, does not speak an Indigenous language
Indigenous language	speaks an Indigenous language
Not removed	omitted category, not removed from natural family
Removed	removed from natural family
Not TSI	omitted category, does not claim Torres Strait Islander heritage
TSI	claims Torres Strait Islander heritage
Crime	
Not arrested	omitted category, not arrested in the last five years
Arrested	arrested in the last five years
Housing Issues	
No crowding	omitted category, lived in a house without overcrowding
Crowding	lived in a house with overcrowding
Repairs	omitted category, repairs had been carried out in the last 12 months
No repairs	repairs had not been carried out in the last 12 months
Not lacking facilities	omitted category, not lacking facilities to wash people and clothes, prepare food and working sewerage
Facilities	lacking at least one set of essential facilities described above
No structural problems	omitted category, no structural problems reported
Structural problems	structural problems reported

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