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DISCUSSION PAPER

**The geographic distribution of
unemployment-related benefits
and CDEP scheme employment**

J.C. Altman and B. Hunter

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- assist in the development of government strategies aimed at raising the level of Aboriginal and Torres Strait Islander participation in the labour market.

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Professor Jon Altman
Director, CAEPR
Australian National University

ABSTRACT

The analysis of the geography of unemployment-related benefits and Community Development Employment Projects (CDEP) scheme employment yields several insights into Indigenous labour market activity. By simultaneously examining both, it is possible to estimate the proportion of the Indigenous labour force which depends on some form of government assistance. The CDEP scheme also alters geographic patterns of unemployment and long-term unemployment and partially redresses the spatial mismatch of employment demand and Indigenous labour supply. Future policy should focus on increasing the mobility of Indigenous workers across areas, industry and occupation.

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Professor Jon Altman is Director and Dr Boyd Hunter is Post-Doctoral Fellow at the Centre for Aboriginal Economic Policy Research, Faculty of Arts, The Australian National University, Canberra.

The first of the two parts of the book is devoted to a general introduction to the subject of the history of the English language. It deals with the various stages of the language from its earliest form, Old English, to the modern English of today. The second part of the book is devoted to a detailed study of the history of the English language in the United States. It discusses the influence of the various immigrant groups on the development of the American English dialects and the role of the English language in the formation of the American identity.

The book is written in a clear and concise style, making it accessible to a wide range of readers. It is a valuable resource for anyone interested in the history of the English language and the role of language in the development of a nation. The book is divided into two main parts, each with several chapters. The first part covers the history of the English language from its earliest form to the present day. The second part covers the history of the English language in the United States, discussing the influence of various immigrant groups and the role of the English language in the formation of the American identity.

The disproportionate presence of Indigenous peoples in remote and rural Australia means that spatial analysis is required to understand Indigenous labour market experience. Such analysis has added policy significance in Indigenous affairs with the political, administrative and program structures of the Aboriginal and Torres Strait Islander Commission (ATSIC) which intentionally reflect the concept of regionalism (Dillon 1992: 102). This paper examines the interrelationships between the location of the Department of Social Security's (DSS's) Indigenous unemployment-related beneficiaries and the ATSIC administered Community Development Employment Projects (CDEP) scheme employment to assist the understanding of the institutional and labour market processes which, partially at least, underpin Indigenous welfare.¹ By combining regional data from the 1991 Census, DSS, ATSIC and the Australian Bureau of Statistics (ABS), it is also possible to shed light on how local employment demand affects Indigenous unemployment and welfare outcomes.² The data also provides, for the first time, a preliminary insight into the Indigenous labour force's dependence on unemployment-related government assistance. For Australia as a whole, 38 per cent were either receiving unemployment-related benefits or participating in CDEP scheme employment.

Clearly, the CDEP scheme has become an important element of Indigenous labour market experience since it was established in 1977 as a response to the spread of unemployment benefits to remote Aboriginal communities. It offers participating communities an alternative to social security payments by making grants to community organisations to employ members in community development projects. Despite numerous links and references to unemployment-related benefits in its guidelines, the CDEP scheme is not tightly linked to DSS's benefit system and it should be considered both a welfare and workforce program (Altman and Sanders 1991).

The geographic dimension of the CDEP scheme has potentially important implications for both the level and composition of unemployment-related beneficiaries. Given that over 27,000 people currently participate in the scheme Australia-wide, it is quite probable that both the level and the composition of unemployment-related beneficiaries will be severely distorted in areas where the scheme provides a significant proportion of 'employment'. Clearly, the displacement of unemployment-related benefits by CDEP scheme employment will also directly affect the geographic distribution of DSS's welfare expenditure.

Data

The Centre for Population and Urban Research at Monash University generated a data file based on the postcode level of aggregation for all 24,121 Indigenous people identified as receiving unemployment-related

benefits from DSS in August 1995.³ Table 1 provides a detailed description of the type of unemployment-related benefit being received by DSS's Indigenous clients. Only 1,422 clients, or 5.9 per cent of the Indigenous client base, were Torres Strait Islanders, with the remainder recorded as Aboriginal.

Table 1. Distribution of Indigenous unemployment-related benefits by benefit type, August 1995.

Benefit type	Number	Per cent
Drought relief	4	0.0
Farm household subsidy	1	0.0
Jobsearch	10,094	41.9
Newstart	11,835	49.1
Sickness	907	3.8
Special benefit - Jobsearch concession	38	0.2
Special benefit - other	304	1.3
Widow allowance	47	0.2
Youth training	891	3.7
Total	24,121	100.0

Source: Unpublished DSS data.

The majority of DSS clients (91 per cent) in Table 1 either receive Jobsearch Allowance or Newstart Allowance. All the benefits listed in Table 1 refer to either 'unemployment-related benefits' or DSS welfare payments which are based on potential employment or labour market participation (hereafter both are referred to as unemployment-related benefits). For example, sickness benefit recipients are included because they are temporarily displaced from the possibility of employment by sickness or illness. The potential for substitution between benefits mean that all unemployment-related benefits need to be analysed simultaneously.

Males predominated in the DSS file, with only 30.2 per cent of the total DSS data being female. This preponderance of males was certainly higher than the male proportion of Indigenous unemployed persons recorded by the National Aboriginal and Torres Strait Islander Survey (NATSIS), which was only 60 per cent (ABS 1995a). Since females in Indigenous society, as in non-Indigenous society, are more likely to be considered the secondary income earner in the family, the new parenting allowance introduced one month before the DSS data were collected may impart a gender bias in the DSS data, relative to NATSIS, towards males. However, given that the preponderance of males is of a similar order of magnitude for the non-Indigenous population, it is unlikely that this gender mix represents significant selectivity bias in this DSS data.⁴

A large number of Indigenous clients had a limited experience in the labour force, with over 30 per cent (or 7,300 clients) having no previous employment. Of these, 38 per cent (or 2,784 clients) had not secured employment since leaving school. The majority of Indigenous clients had been wage and salary earners in previous employment (14,981 clients or 62.1 per cent). Only 0.5 per cent (or 104 Indigenous clients) were self-employed before they became unemployed.

The high rate of long-term unemployment among Indigenous people is reflected in the fact that almost 40 per cent of DSS's Indigenous clients have been without employment for more than 12 months. This rate of long-term unemployment is clearly higher than the 31 per cent of all unemployed Australians who were out of work for more than 12 months at August 1995. The average unemployment duration for these clients is roughly equivalent to that measured in other data sets (Junankar and Kapuscinski 1991).

The other major data sources used are the 1991 Census and the NATSIS. The 1991 Census Collection District (CD) summary file was aggregated to the postcode, section-of-State and ATSI region levels for this analysis. The only variables used from the 1991 Census were the overall level of employment and the size of the Indigenous populations in the respective areas. The NATSIS provided recent data on Indigenous population 15 years and over and CDEP scheme employment across geographic units (part-of-State or ATSI region). All data are adjusted to the 1995 equivalents using the estimated resident population growth published by the ABS at the State/Territory level of aggregation (ABS 1995b).

Geographic scale

An important question is at what level the regional analysis should be conducted. In practical terms, the answer involves a trade-off between the level of detail and range of data required for useful policy evaluation, on the one hand, and issues such as the level of non-response to questions and the complexities involved in handling and analysing disaggregated data sets, on the other. While the DSS data are available at the postcode level, it is not possible to utilise this fine level of detail because of the small population problem.⁵ ATSI regional council areas provide a convenient intermediary framework for analysis which has the added advantage of providing data to match the ATSI administrative structure. Therefore, in order to fully utilise the data from ATSI and ABS, the smallest possible aggregations are examined including section-of-State and ATSI regional council levels.

The examination of unemployment duration across section-of-State classification used in the 1991 Census reveals relatively small differences in the patterns of unemployment between urban and rural areas (Table 2).⁶

While the pattern of unemployment duration is consistent with a low level of employment demand in rural and remote areas, the differences across sections-of-State are not as large as might be expected. The most likely explanation for the lack of variation across sections-of-State is that the CDEP scheme is disproportionately affecting the composition of the pool of Indigenous unemployed, with many potentially long-term unemployed participating in the CDEP scheme. Given that the higher levels of aggregation, such as section-of-State, are not capturing some of the important variations in Indigenous unemployment, the remainder of this paper focuses on ATSI regions.

Table 2. Duration of unemployment by section-of-State, August 1995.^a

	Major urban		Other urban		Rural	
	Number	Per cent	Number	Per cent	Number	Per cent
Up to 6 months	2,312	41.0	4,162	41.9	2,719	37.5
6 months to 1 year	1,203	21.3	2,068	20.8	1,501	20.7
1 to 2 years	1,040	18.4	1,706	17.2	1,277	17.6
2 to 3 years	458	8.1	786	7.9	627	8.6
Over 3 years	603	10.7	1,163	11.7	1,111	15.3
Invalid code	25	0.4	38	0.4	19	0.3
Total	5,641	100.0	9,922	100.0	7,254	100.0
Unemployment/ population ratio ^b		9.9		12.1		10.8

a. The postcode data are aggregated to section-of-State level using the correspondences available from the 1991 Census. The DSS data is allocated proportionately, using population weights, to each section-of-State depending on the number of 1991 Census CDs in the respective section-of-State. However, the postcodes recorded in DSS data may not necessarily relate to permanent residential addresses as clients may use a post office box in the nearest urban area. For example, Alice Springs and Darwin may serve much of the surrounding remote and rural parts of the Northern Territory.

b. Unemployment total expressed as a proportion of the Indigenous population 15 years and over.

Source: Unpublished DSS data.

Data quality issues

Given that the Indigenous status of DSS clients is self-designated, care should be exercised in interpreting these data. However, given the large number of Indigenous people receiving DSS benefits, selectivity should not represent a significant problem. As long as the identification rate is reasonably similar in all areas being analysed, this geographic analysis should not be significantly biased.⁷

One measure of data quality is the extent to which the level of unemployment is understated by DSS data. The data set contains about 60

per cent of the 40,000 Indigenous people estimated to be unemployed by NATSIS in 1994 (ABS 1995a). There are several reasons why DSS data are lower than the NATSIS figures. First, the DSS results may understate the actual number of unemployed, because self-identification may only partially reveal the actual population of Indigenous unemployed.

Second, the definitions adopted by NATSIS mean that its data tend to give a relatively high estimate of the number of unemployed relative to the Monthly Labour Force Survey (MLFS). NATSIS respondents were classified as unemployed if they were registered with the Commonwealth Employment Service (CES), irrespective of whether they claimed to be looking for work.⁸ The differences in definition of unemployment mean that approximately 20 per cent of the people classified as unemployed by NATSIS would be reclassified as not in the labour force if the strict MLFS definitions were applied (ABS 1996: 82). This, of itself, will account for a large amount of the difference in number of unemployed.

Third, NATSIS and DSS data are measuring different things because spouses of unemployed may not receive unemployment-related benefits but may have been classified as unemployed for the purposes of NATSIS. For example, the new parenting allowance is paid to spouses of the unemployed with parental responsibility, even if the spouse is actively seeking employment at the local CES.

Finally, the overall fall in the level of unemployment for all Australians between the times of data collection may tend to lower the measured level of unemployment for Indigenous Australians. Given that Indigenous people are over-represented in the ranks of the unemployed, the fall in the national level of unemployment by 1.5 per cent between June 1994 and August 1995 may partially explain why the measured level of unemployed from DSS data is less than that in NATSIS.⁹

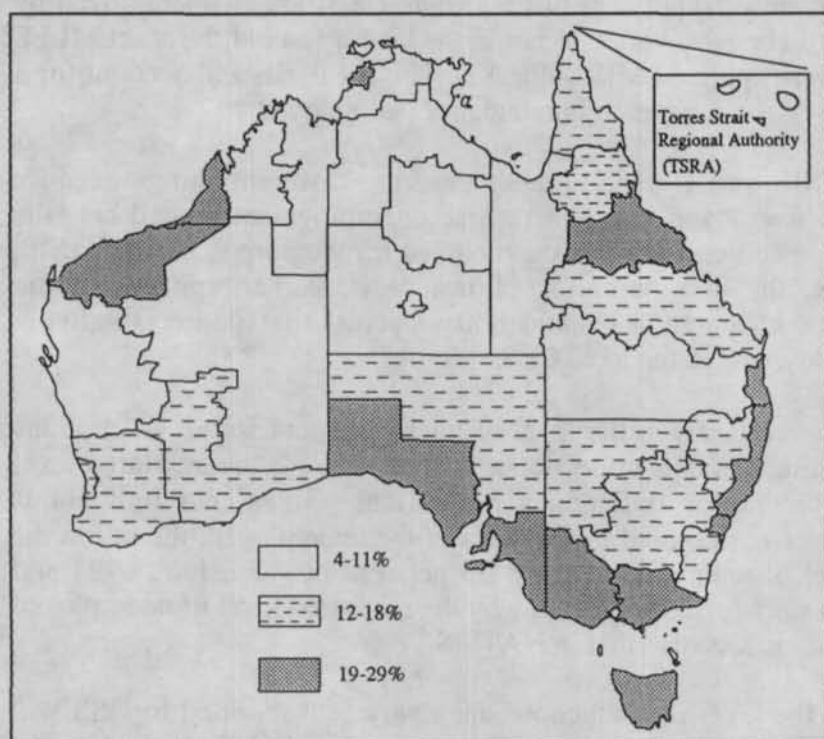
On balance, the level of Indigenous unemployment reported to DSS will understate the actual unemployment/population ratio. Notwithstanding these qualifications, the DSS data represents a large component of the Indigenous unemployed which should provide a useful insight into the regional variation of unemployment.

Regional patterns of educational qualifications, employment, unemployment and CDEP scheme participation across ATSIC regions

The examination of data at the ATSIC regional council level allows the presentation of a national picture of spatial patterns in key educational and labour market indicators. These patterns are presented in a series of maps, starting with Figure 1 which shows the proportion of the Indigenous population 15 years and over, with a post-school qualification, by ATSIC

region. In each case, the data have been organised around a uniform frequency distribution to create three categories of relative rates – low, average and high ranges.¹⁰ That is, the 36 ATSIC regions are ordered and put into three groups of 12 regions. For example, in Figure 1, the 12 ATSIC regions with the lowest proportion of population with a post-school qualification are classified in the low range. Symmetrically, the 12 ATSIC regions with the highest proportion are classified in the high range.

Figure 1. Proportion of the Indigenous population 15 years and over with a post-school qualification by ATSIC region.

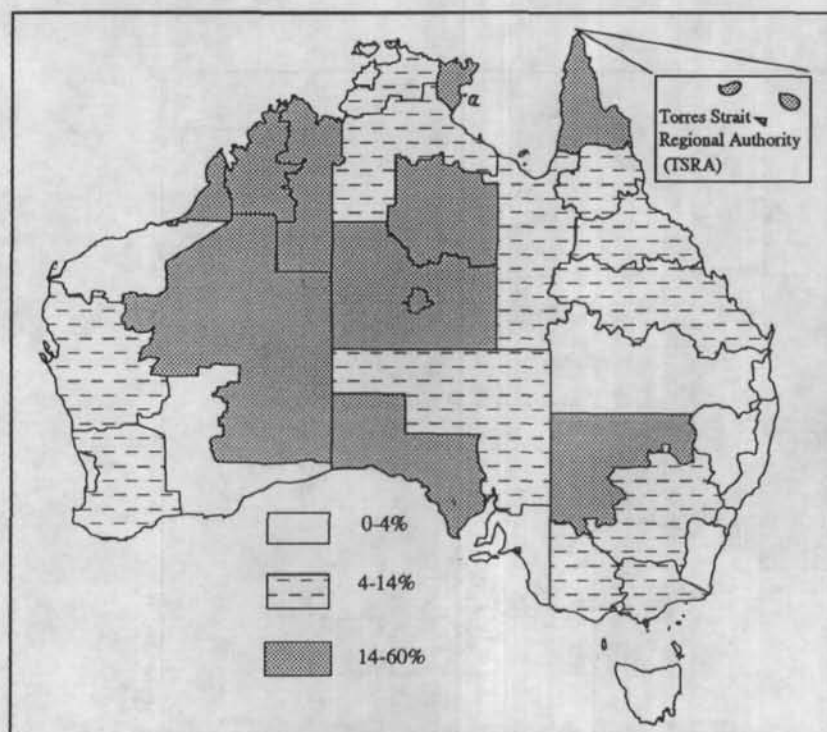


Source: ABS (1995a).

The geographic distribution of post-school qualifications illustrated in Figure 1 shows that the least-qualified Indigenous peoples are found in remote regions in northern Australia. Indeed the level of qualifications in the group of regions without shading, which so predominate in the north of the continent, is about a third of the level apparent in the most qualified group of regions. Economic theory and empirical evidence place a great deal of emphasis on the importance of education and qualifications in securing employment and avoiding unemployment. Therefore, all else being equal, there should be a strong expectation that this pattern will be

reflected in a concentration of unemployment in northern remote regions and stronger employment prospects in other regions.

Figure 2. Proportion of the Indigenous population 15 years and over in CDEP scheme employment by ATSI region.^a



a. See Appendix Table A.2.

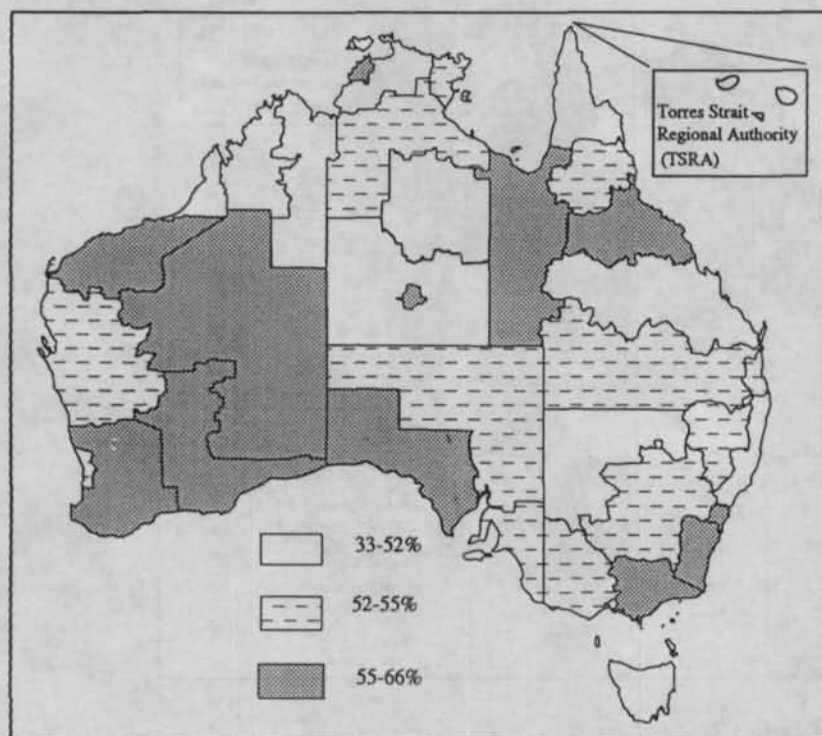
Source: ABS (1995a).

NATSIS allows the proportion of a population 15 years and over in CDEP scheme employment to be estimated for each ATSI regions. Figure 2 clearly illustrates that CDEP scheme employment is a prominent influence on the Indigenous labour market in many remote and rural regions such as the Kimberleys, Western Desert, east Arnhem Land, central Australia, Cape York Peninsula, Murdi Paaki and Wangka-Wilurrara regions.¹¹ As many as 60 per cent of the population 15 years and over of age were employed in CDEP schemes. Most of these areas with a high level of CDEP scheme participation have limited access to mainstream labour market opportunities.

Participation in the CDEP scheme is either very limited or non-existent in the south-eastern corner of the continent, including Sydney, south-eastern New South Wales, western Victoria and Tasmania. Most of Australia's

metropolitan areas have very low levels of participation in the CDEP scheme. This pattern is not surprising, given the CDEP scheme's historical link to remote rural areas.

Figure 3. Employment/population ratio (excluding CDEP scheme employment) for the entire population 15 years and over by ATSIC region.



a. See Appendix Table A.2.

Source: ABS (1991, 1995a); Commonwealth of Australia (1994: 37-8).

In addition to CDEP scheme employment, another important factor determining Indigenous unemployment is the overall level of employment demand in the local area. The level of non-CDEP scheme employment held by either Indigenous or non-Indigenous residents in a region is a direct indication of the number jobs of available in a region. If we accept that the labour market is constrained on the demand side, then the level of employment is a measure of labour demand in an area. Since the population size varies between ATSIC regions, we have to standardise the level of employment in some way. For this paper, employment demand is estimated by dividing employment by the total population 15 years and over in a respective area. This is the probability, for the average resident, of being employed in mainstream employment and is calculated by

adjusting the 1991 Census employment/population ratios for the local level of employment in the CDEP scheme. The very fact that the employment/population ratio in Figure 3 is calculated for the whole population means that it will not be sensitive to supply-side factors in the Indigenous population and therefore provides a reasonable proxy for local employment demand faced by Indigenous residents.¹²

As hypothesised earlier, there are relatively high employment demands in the south-east corner of Australia. However, urbanised areas outside of Sydney and Melbourne tend to have only average employment/population ratios. This points to a potential weakness of employment/population ratio as a measure of demand because the high range is dominated by remote areas with substantial mining and associated activities, such as Mount Isa, Pilbara and Kalgoorlie. While it is true the majority of the non-Indigenous population in such remote communities live there because of employment, the question of why the Indigenous population is not securing employment in areas where there is nominally plenty of work arises. The historical lack of Indigenous people in the mining and 'growth' industries such as tourism is clearly indicated in other research and may mean that there is no simple relationship between Indigenous employment opportunities and employment demand (Taylor 1993a, 1993b).

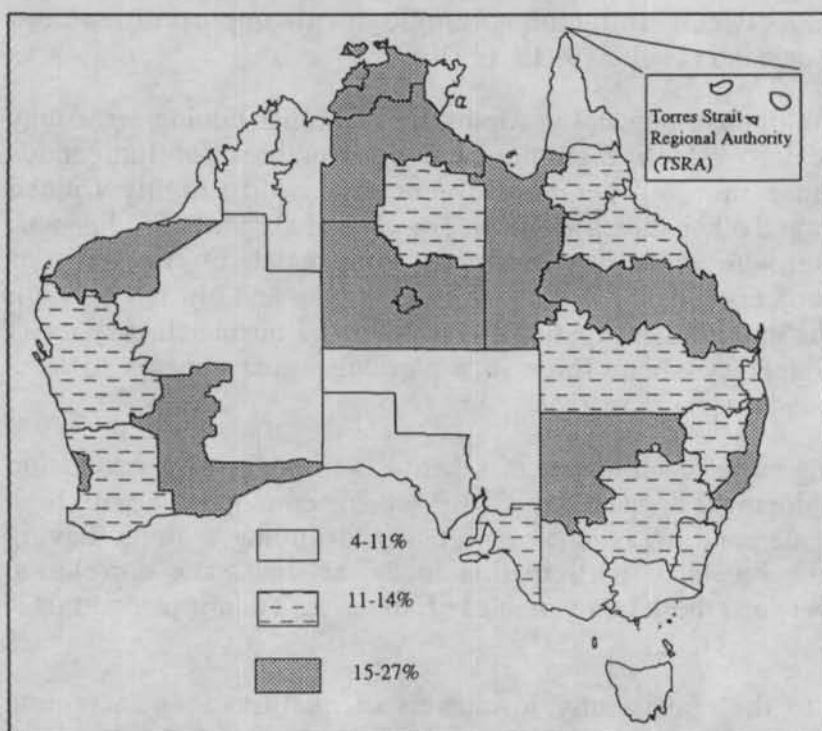
The high employment demand in Mount Isa and other mining areas may not translate into effective employment opportunities for Indigenous people because mining operations frequently require highly trained professionals and other skilled workers. The general absence of Indigenous workers in growth industries results in a mismatch of the skills of Indigenous workers and employment demand (Taylor and Liu 1995, 1996). Indeed, in the extreme, occupational and industrial mismatch may mean that the Indigenous labour force in a particular area appears to be a separate, secondary labour market.

The preceding two maps illustrate that there is a strong inverse association between employment demand and CDEP scheme employment, with high employment demand areas, such as urban and mining regions, having relatively low levels of participation in the scheme. The correlation coefficient between these two variables of minus 0.52 confirms that this is the case.

In contrast to the consistently low levels of qualifications in remote northern Australia, there is substantial variation in the level of unemployment-related benefits received in these regions (Figure 4). Outside the Northern Territory, many people in northern Australia, including Cape York Peninsula in Queensland and Kullarri, Derby, Wunan and Western Desert in Western Australia, have low unemployment-population ratios with between 4 and 11 per cent receiving unemployment-related benefits. Average unemployment-related benefit ratios of between

11 and 14 per cent were found in areas with low levels of education in many other areas of northern Australia, including Geraldton, Goolburri and Yapakurlangu. It is no coincidence that most of these remote areas have a high level of participation in the CDEP scheme. There appears to be a displacement of the Indigenous unemployed into CDEP scheme employment in these areas (ABS 1996). However, above-average rates of employment in the CDEP scheme do not necessarily produce low unemployment/population ratios. For example, Alice Springs and the Papunya region of the Northern Territory and Murdi Paaki in north-west New South Wales had an above-average unemployment-related benefit ratio despite having above average employment in the CDEP scheme. Clearly, many CDEP workers in these areas are drawn from those previously outside the labour force (see Altman and Hunter 1996).

Figure 4. Proportion of the Indigenous population 15 years and over who receive unemployment-related benefits by ATSI region, August 1995.^a



a. See Appendix Table A.2.

Source: ABS (1995a); unpublished DSS data; estimated residential population, ABS (1995b).

There is also little consistency between ATSI regions in the high range of between 15 and 27 per cent. The uneven pattern of unemployment-related

benefit is also evident in the fact that many people in southern Australia have relatively high benefit rates compared to expectations based on Figure 1. The north coast of New South Wales and the Perth area (Icarlarnyiny) have relatively high unemployment-population ratios compared to the proportion of the population with post-school qualifications. Both of these areas have low levels of participation in the CDEP scheme. Therefore, while the CDEP scheme may largely explain the low levels of unemployment in remote areas, it only plays a small part in explaining the level of unemployment in metropolitan areas and areas in the south-east corner of the continent which have access to more developed mainstream labour markets as well as limited opportunities for employment in the CDEP scheme.

Despite the limits of the CDEP scheme's influence in many situations, it still needs to be accounted for in any regional analysis of Indigenous labour market experience.¹³ To the extent that the above maps indicate that the CDEP scheme explains irregularities in the geographic distribution of unemployment, it is important to also consider its influence on DSS coverage.

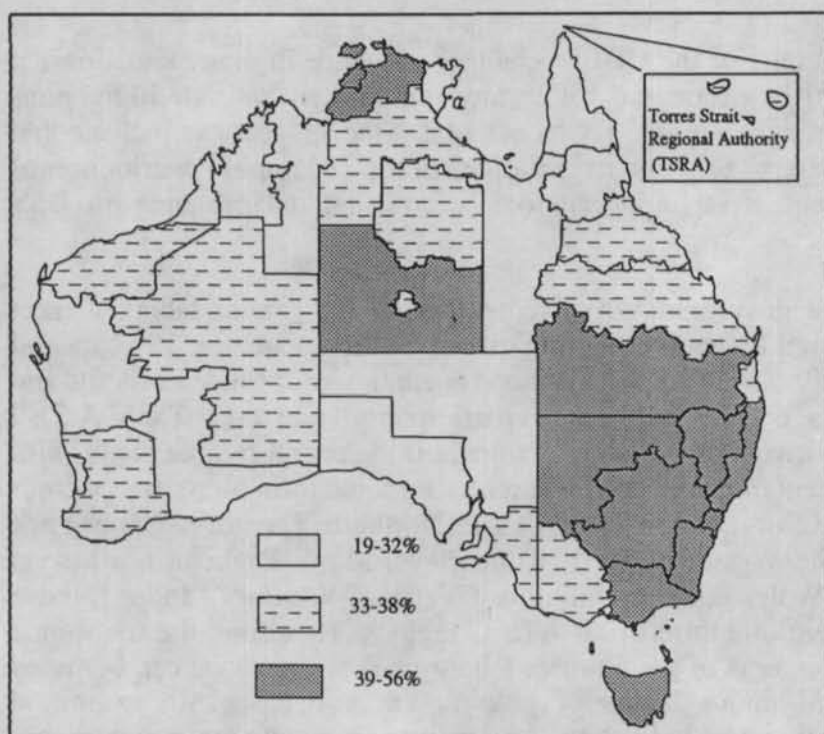
The extent of government involvement in the Indigenous labour market can be captured by adding the proportions of the population 15 years and over in CDEP scheme employment and unemployment-related benefits and dividing this by the Indigenous participation rate (see Table A.2).¹⁴ Government involvement is the dominant influence in remote areas, with over 50 per cent of the labour force receiving some form of assistance from either ATSIC or DSS in most of the Northern Territory, Cape York Peninsula, the Western Desert, Kimberleys, Murdi Paaki in north-west New South Wales and the Nullarbor (Wangka Wilurrara). Indeed, these areas represent one-third of all ATSIC regions. Therefore, the traditional geographic patterns of government labour market assistance can be noted when several major forms of government assistance are examined simultaneously.¹⁵ The Indigenous labour force in remote areas is probably more dependent on government assistance because of limited access to mainstream employment.

The CDEP scheme may be affecting the composition of unemployment as well as the level of unemployment of an area. For example, does the existence of substantial participation in the CDEP scheme in many remote areas absorb those people who are most likely to be unemployed for prolonged periods? The pattern of long-term Indigenous unemployment in Figure 5 suggests that this is the case, with many remote areas having low or average levels of long-term unemployment.

The CDEP scheme provides one explanation for this anomaly. Since the CDEP scheme gives employment to those people with a high chance of

being long-term unemployed in remote Australia, then the availability of the scheme in an area may transform the overall pool of unemployed so that there are fewer Indigenous unemployed who have been out of work for prolonged periods. That is, the problem of accessing mainstream labour markets in many remote areas, for example, Cape York Peninsula and the Kimberleys, is balanced out, for Indigenous residents at least, by enhanced accessibility to CDEP scheme jobs.

Figure 5. Proportion of the Indigenous unemployed who are long-term unemployed by ATSI region, August 1995.^{a,b}



- a. The long-term unemployed are those persons who have been unemployed for more than 12 months.
 b. See Appendix Table A.2.

Source: Unpublished DSS data.

The most surprising aspect of Figure 5 is that almost all of south-eastern Australia has relatively high long-term unemployment/population ratios. Even the Sydney and Melbourne (Binjirru) areas have relatively high rates of long-term unemployment. While this is surprising given that most of these areas in the south-eastern corner of the continent have a reasonable access to mainstream labour market opportunities, it is consistent with the a general lack of CDEP scheme jobs in cities. Another possible explanation

is that the urban Indigenous population live in locationally disadvantaged areas where there is limited or expensive access to existing jobs (Hunter 1996).

This pattern of long-term unemployment should also be reconciled with Table 2 which showed little variation in unemployment duration across section-of-State. The differences between Table 2 and Figure 5 arise because the map of ATSI regions allow us to examine more geographic variations in unemployment duration. Therefore, while unemployment duration may, on average, be lower in urban areas, there is substantial variation in the proportion of long-term unemployed.

Displacement of unemployment-related benefits by CDEP scheme employment

The previous section confirmed that both the CDEP scheme and employment demand are important factors in determining the level of unemployment-related benefits in an area. This section attempts to quantify the relationships between these three variables more formally using several simple regression models. Elementary ordinary least squares (OLS) techniques are used to estimate the factors underlying the geographic distribution of CDEP scheme employment and unemployment-related benefits.

The major limitation of the technique is that there is only accurate information on the Indigenous population from all sources for 36 ATSI regions. Notwithstanding the severe limitations of the sample size, it permits a preliminary regional analysis of CDEP and unemployment-related benefits. Given the importance of the CDEP scheme in the Indigenous labour market identified above and the potential importance of the interaction of the CDEP scheme and employment demand, it will be useful to construct an elementary model of CDEP scheme employment. A second regression will then model the influence of CDEP and employment demand on unemployment-related benefits.

Modelling CDEP scheme employment

While it is reasonable to assume that bureaucratic, political and institutional forces strongly influence the regional allocation of the CDEP scheme, there are several other factors which may also determine whether a community attempts to join the scheme. The major candidate is a chronic lack of employment demand. If the community was going to experience chronic structural unemployment, then the CDEP scheme is an attractive alternative. Low levels of employment demand may also capture the effect of poor local government infrastructure endemic in the poorer remote areas. The employment variable mapped in Figure 3 is used to proxy the total number of jobs available in an area (Model 1).

Two other variables are included in the CDEP regression: the proportion of the population which has post-school qualifications and the proportion who speak an Indigenous language. The former is included as a rough proxy for higher levels of education which may increase mainstream labour market opportunities and therefore reduce the dependence on CDEP scheme employment (Model 2). The proportion who speak an Indigenous language is included in the regression as a proxy for certain supply-side factors, including attachment to culture and community values, which may be an important aspect of working for the community in a scheme which, partially at least, formally recognises cultural imperatives within Indigenous communities (Altman and Sanders 1991). This language variable may also capture the effect of limited mobility for a workforce with greater social links to the local area (Model 3).

Employment demand can be considered to be largely fixed (or exogenous) with respect to the small Indigenous population. Similarly, the level of post-school qualifications and the proportion of the population who speak an Indigenous language are not likely to be driven by the level of CDEP scheme employment.

Table 3. OLS analysis of CDEP scheme employment.^a

Variable	Model 1	Model 2	Model 3
Intercept	0.65 (4.9)*	0.65 (4.9)*	0.50 (3.5)*
Employment demand	-1.01 (-4.0)*	-0.88 (-3.3)*	-0.80 (-3.1)*
Post-secondary qualifications		-0.43 (-1.4)	
Speaks Indigenous language			0.15 (2.2)*
Number of observations	36	36	36
R ²	0.32	0.36	0.41
F(k, 36-k) ^b	15.9	9.2	11.4

- a. 't' statistics which indicate the significance of individual parameter estimates are reported in parenthesis; if significant at the 5 per cent level they are marked with an asterisk.
 b. These F statistic measure the overall significance of each model. All regressions are significant at the 5 per cent level.

Source: Unpublished postcode level data from DSS, August 1995, is aggregated to 36 ATSI regions.

How does each factor relate to CDEP scheme employment? Table 3 shows the result of the estimation of three basic models. The clearest result from all three models is that employment demand is strongly related to CDEP

scheme employment in an area. Model 1 shows that a 1 percentage point increase in employment demand is associated with a 1 percentage point fall in the proportion of the population in CDEP employment. The significance of this relationship is not altered when the other variables are included. Another interesting aspect of Model 1 is that almost one-third of the regional variation in CDEP scheme can be explained by employment demand.¹⁶ Even though the CDEP scheme is primarily driven by institutional and bureaucratic factors, there are major structural economic factors underlying the location of CDEP scheme employment. That is, CDEP scheme employment is targeted at regions with low employment opportunities.

The inclusion of the qualification and language variable only marginally increases our ability to explain where CDEP scheme employment is located (Models 2 and 3). Indeed, changes in the amount of post-school qualification does not significantly affect the proportion in CDEP. While the presence of many Indigenous language speakers increases the ability to explain CDEP scheme employment significantly, it is largely capturing the lack of employment demand in remote areas. That is, the employment demand variable falls when either the qualification or language variable is included in the regression. Therefore, in the interest of a parsimonious specification, and in deference to the small size of the sample, Model 1 is the preferred model of CDEP scheme employment in subsequent analysis.

Modelling the displacement of unemployment-related benefits for CDEP scheme employment

In attempting to model the regional variation of unemployment-related benefits and the degree of displacement between such benefits and CDEP scheme employment, it may not be possible to assume that CDEP scheme employment is fixed (exogenous). To keep the analysis as simple as possible, the residuals from the CDEP equation (see Table 3, Model 1) are kept and used in the estimates of the geographic distribution of unemployment benefits (Table 4, Model 1). If the residual from the CDEP equation is not statistically significant, then it is possible to assume that the level of CDEP employment is fixed (Nakamura and Nakamura 1981; Beggs 1988: 95-96). The intuition underlying this test is that, if the CDEP scheme is exogenous, then the residual will not contain any new information and therefore it does not need to be included in subsequent regressions.

Model 1 appears to indicate that the displacement of unemployment-related benefits by CDEP is not significant. However, given that the CDEP residual is not significant in its own right, this model is mis-specified and the residual is excluded in the subsequent models. That is, including the raw CDEP scheme variable in regressions does not significantly bias the estimates because it can be considered fixed or exogenous. Models 2 to 4 in turn test the effect of including CDEP scheme employment by itself as

well as the employment demand and the qualification variables used above. CDEP employment is clearly significant when it is included in its own right in all three models.

Table 4. OLS analysis of proportion of Indigenous population receiving unemployment-related benefits across ATSIC regions.^a

Variable	Model 1 ^b	Model 2	Model 3	Model 4
Intercept	0.23 (8.4)*	0.24 (12.9)*	0.20 (3.0)*	0.34 (8.7)*
CDEP scheme	-0.18 (-0.9)	-0.25 (-2.6)*	-0.22 (-3.1)*	-0.36 (-3.7)*
CDEP residual	-0.11 (-0.5)			
Employment demand			0.03 (0.3)	
Post-secondary qualifications			-0.34 (-2.7)*	-0.57 (-2.8)*
Number of observations	36	36	36	36
R ²	0.17	0.16	0.33	0.33
F(k, 36-k) ^c	6.6	3.4	5.1	8.0

a. See footnote a. in Table 3.

b. This model is estimated using two stage least squares to ensure that the standard errors are consistent.

c. See footnote b. in Table 3.

Source: Postcode level data from DSS database, August 1995, is aggregated to 36 ATSIC regions.

One of the most interesting aspects of the analysis is that employment demand has no significant impact on the location of Indigenous unemployment measured by DSS data (Model 3).¹⁷ This reinforces the preceding speculation that Indigenous employment and unemployment outcomes are largely insulated from the mainstream labour market (see Altman and Daly 1992). This supports the view that there is a substantial degree of industrial and occupational mismatch between Indigenous workers and labour demand.

The results for the qualification variable are consistent with other studies of Indigenous labour force status (Daly 1995; ABS 1996). Model 3 shows that education provides significant protection against unemployment. Furthermore, the influence of education is significant, irrespective of the level of employment demand in the local area.

While most of the unemployment variation across ATSI regions remains unexplained by our models, there is some indication of the importance of education and CDEP scheme employment in determining the unemployment ratio of an area.¹⁸ The preferred regression (Model 4) explains one-third of the regional variation of unemployment-related benefits. However, the size of the displacement of unemployment-related benefits for CDEP in this final model is not large. A 10 percentage point increase in CDEP scheme employment only leads to a 3.6 percentage point reduction in unemployment-related benefits. If CDEP scheme employment is a perfect substitute for unemployment-related benefits, then the proportion receiving these DSS benefits would be reduced by 10 percentage points. Therefore, these results confirm that many CDEP scheme participants are drawn from outside the labour force rather than from the pool of Indigenous unemployed (Altman and Hunter 1996). Clearly, the multi-faceted nature of the scheme means that CDEP scheme employment addresses several needs in the community and cannot be considered as just another source of unemployment-related welfare. This provides statistical confirmation for the assertion that the CDEP scheme should be considered as a 'workfare' rather than a welfare scheme (Sanders 1993).

Policy discussion

This paper emphasises the importance of geography, through analysis of the spatial distributions of CDEP scheme employment and unemployment-related benefits. CDEP scheme employment appears to provide an effective substitute for employment demand in areas where it is deficient. The strong inverse association between regional employment opportunities and the location of CDEP scheme employment is evidence that CDEP is extremely important in addressing the spatial mismatch of Indigenous workers and jobs.

The general lack of inter-regional mobility of the Indigenous population noted elsewhere (Bell and Taylor 1994) tends to reinforce this spatial mismatch across ATSI regions. One alternative to CDEP for redressing spatial mismatch is to encourage labour mobility to areas where job opportunities exist. However, this may not be a realistic option, given the strong attachment many Indigenous people in rural and remote regions have towards their traditional lands and their complex kin networks.

The growth of CDEP scheme participation has clearly complicated the analysis of Indigenous unemployment. This paper shows that it has clear implications for the number of DSS clients on unemployment-related benefits and the composition of the remaining clients. While the pattern of Indigenous unemployment may differ from other Australians, care should be exercised in interpreting these results.

The Royal Commission into Aboriginal Deaths in Custody repeatedly expressed concern about the extent to which Indigenous people endure chronic unemployment and the potential social pathology that arises from it (Commonwealth of Australia 1991: 380-83). The results of this analysis indicate that the problem of long-term unemployment among Indigenous people is more evident in the more developed parts of the continent in south-east Australia. However, while the measured level of chronic unemployment may be relatively low in many remote areas, there are still valid questions about the extent to which CDEP is merely artificially altering the number rather than addressing the core issues relating to the potential social pathology (Smith 1994, 1995).¹⁹

The regression analysis indicates that there is a limited level of replacement between CDEP and unemployment-related benefits. Therefore, to understand the patterns of dependence of Indigenous people on government support, one cannot simply add CDEP and unemployment-related benefits. Indeed, even with respect to Indigenous welfare dependence, one cannot view CDEP as a simple welfare tool. In addition to addressing community needs, the scheme plays a role in redressing the adverse employment demand conditions in remote areas (Sanders 1993). While CDEP's ambiguous status, somewhere between work and welfare, makes analysis of welfare dependence more complex, it cannot be ignored in any analysis of Indigenous welfare, regional or otherwise.

Furthermore, once CDEP is accounted for in the regression analysis, there appears to be little influence of employment demand on the number of unemployment beneficiaries. Indigenous unemployment appears insensitive to conditions in the mainstream labour market (Altman and Daly 1992). The lack of a significant relationship between employment demand and unemployment-related benefits indicates that the Indigenous and non-Indigenous labour markets are largely separate, with little substitution between the two types of labour. The lack of substitutability of Indigenous and non-Indigenous labour or, more formally, the mismatch of Indigenous labour supply and employment demand across industries and occupations, are the most likely factors to explain the distinct Indigenous labour market that exists in many ATSI regions.

Given that limited physical mobility of many Indigenous workers places a lower bound on the level of spatial mismatch that can be ameliorated by policy makers, it may be more fruitful to address industrial and occupational mismatch. The mismatch across industry and occupation may be less constrained than the spatial variety and will probably respond to improved education and training to facilitate mobility of employment across sectors. Several recent studies of Indigenous employment outcomes point to the significant improvements that can occur with educational and training enhancements.²⁰ However, the regression analysis highlights the need for education to be specifically focused on increasing employment

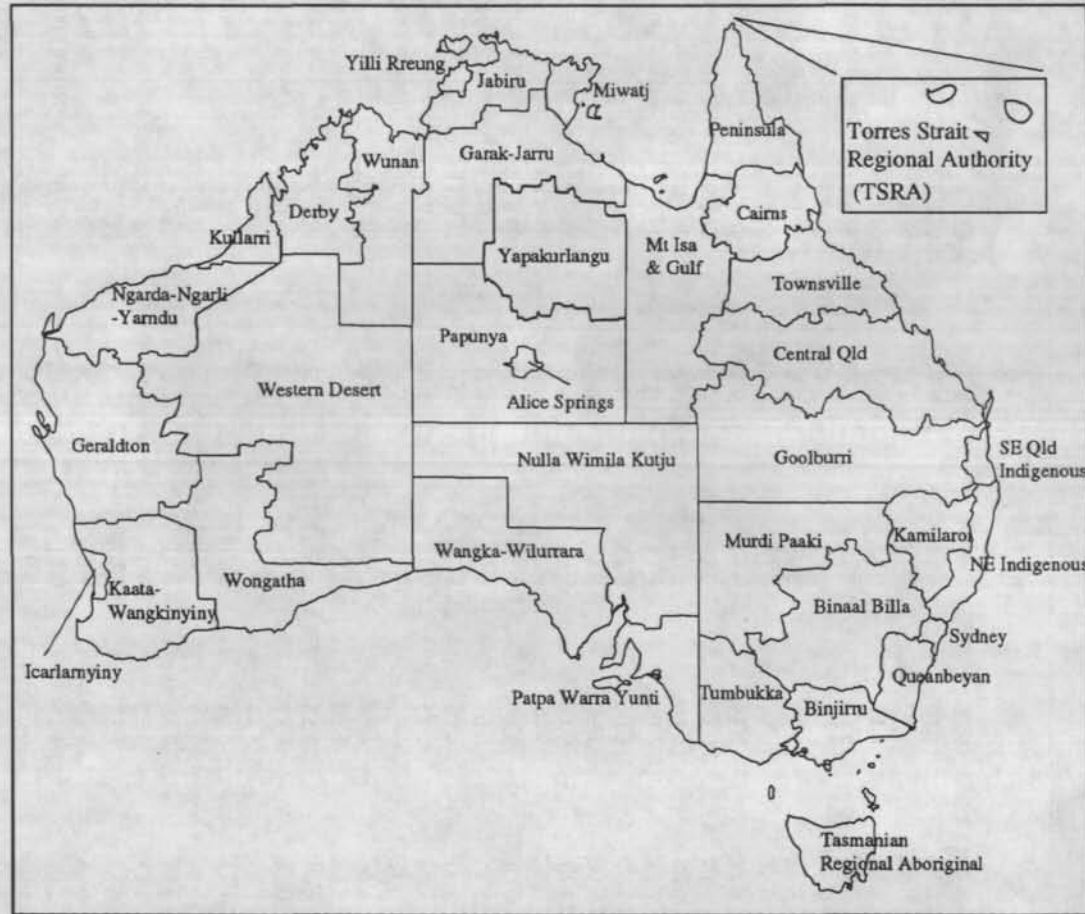
opportunities for Indigenous workers in the local area. That is, to maximise Indigenous employment outcomes, the structure of education should take into account the skills required by local firms, especially those firms in industries with potential for employment growth.

Notes

1. A subsequent working paper will analyse the geographic dimension of welfare dependency by examining the distribution of Indigenous recipients of all DSS pensions and benefits.
2. Without spatial techniques, it is extremely difficult to analyse the effect of employment demand in the mainstream labour market on Indigenous employment outcomes. Indeed, the limited availability of firm-based data which identifies Indigenous employees reinforces the importance of spatial analysis. Case studies may be able to shed light on how demand affects Indigenous employment in particular instances but such analysis has severe limitations as a general basis for policy.
3. Note that the DSS data is an administrative data set which has severe limitations in providing answers to possible research questions as it is not designed for this purpose. Many variables that would be of interest to the researcher, such as geographical migration associated with job search, are not mandatory fields.
4. The Centre for Population and Urban Research have estimated the proportion of males in the non-Indigenous DSS data file to be about 70 per cent.
5. See Hunter (1996) for detailed description of the problem. The population of unemployment-related beneficiaries in each postcode is quite small on average (less than ten) with many postcodes having only one Indigenous person who is unemployed. This is too small to base an estimate of the distribution of unemployment-related benefits. Another related problem is the sampling error deliberately introduced by the ABS into small populations in census data to protect the confidentiality of respondents. This problem is an issue for postcodes with small numbers of Indigenous people. This, unfortunately, includes most postcodes.
6. Also see ABS (1996). The NATSIS results also indicate that there is little variation in long-term Indigenous unemployment across areas. However, these results are not strictly comparable with the DSS results because they are based on the part-of-State rather than the section-of-State geographic classification.
7. There may be structural and infrastructural constraints within DSS regional offices which lead to remote areas having lower rates of identification than other areas. On the other hand, if there are more Indigenous DSS staff, in relative terms, in remote and rural areas, then this may increase identification vis-à-vis other regions. There is no reason to expect either tendency to generate a systematic bias in identification.
8. The number of unemployed identified by NATSIS should be considerably higher than the DSS figure simply because not all registered CES clients will be receiving unemployment-related benefits from DSS.
9. National unemployment rates fell from 9.6 to 8.1 per cent between the collection of NATSIS and the DSS data.

10. Note that the ranges in each category do not necessarily overlap. The reason is that each ATSI region has a distinct value for the respective variable.
11. See Figure A1 for correspondences between names and location for all ATSI regions.
12. The fact that this measure of employment demand will not be influenced significantly by Indigenous labour supply means that it can be considered fixed (or exogenous) when it is used in the regression analysis.
13. See ABS (1996) for a formal statistical analysis of the employment impact of the CDEP scheme.
14. This procedure estimates the proportion of the labour force receiving some form of assistance from either ATSI or DSS because all three variables used in the calculation are defined relative to the Indigenous population 15 years and over.
15. The geographic distribution of the Department of Education, Employment, Training and Youth Affairs (DEETYA) labour market programs are described in Taylor and Hunter (1996). The increase in DEETYA programs in remote localities in recent years means that including DEETYA assistance in the analysis is unlikely to change the sense of this statement.
16. In a simple OLS model, which includes a constant, the R^2 or coefficient of determination can be interpreted as the proportion of variation in the dependent variable which is explained by the independent variable (Greene 1990: 152-56)
17. The results were robust to changing the geographic unit of analysis to the postcode instead of ATSI regions. It was only possible to regress unemployment ratios on employment demand using postcode data because of the limitations of NATSI data. Irrespective of the data limitations, the analysis should be confined to the postcode level given the problems for small area data in Indigenous research (Hunter 1996).
18. This should not diminish the importance of the results as the proportion of variance explained is quite 'high' compared to other cross-sectional studies.
19. Another factor complicating the analysis of unemployment duration is the geographic distribution of DEETYA labour market programs for Indigenous workers. Such programs can reduce duration by reducing the current spell of unemployment. While Taylor and Hunter (1996) provide an initial analysis of DEETYA programs, the geographic units used are not compatible with those used in this paper.
20. The most recent study is ABS (1996). Also see Daly (1995).

Figure A.1. Map of ATSIC regions.



Appendix Table A.2. Geographic distribution of labour market indicators by ATSI regions.

ATSI region	ATSI over 15 years ^a Number	CDEP/ population ^b Per cent	Unemployment- related benefits/ population ^c Per cent	Participation rate ^d Per cent	Long-term unemployed ^e Per cent
Alice Springs	2,935	14.7	18.3	55.7	36.8
Binaal Billa	9,412	5.3	11.1	56.4	45.7
Binjirru	5,667	3.7	6.8	60.9	39.1
Cairns and District	7,286	13.5	14.0	57.1	30.7
Central Qld	5,161	4.7	17.4	63.5	32.9
Derby	2,834	37.2	5.2	57.4	18.9
Garak-Jarru	4,352	10.1	20.5	42.6	37.1
Geraldton	3,238	3.7	14.2	57.4	29.8
Goolburri	4,149	2.1	12.9	57.9	39.5
Icarlarnyiny	7,894	0	15.7	59.9	32.1
Jabiru	5,465	11.0	21.9	57.8	44.4
Kaata-Wangkinyiny	3,238	4.2	12.2	45.7	33.0
Kamilaroi	6,274	3.0	13.7	55.4	44.9
Kullarri	2,226	23.5	10.6	63.2	30.8
Miwatj	4,048	21.3	4.7	58.7	29.3
Mount Isa and Gulf	4,453	13.5	14.6	59.7	31.9
Murdi Paaki	4,453	18.1	21.0	58.3	48.3
NE Indigenous	11,031	2.2	14.5	59.2	41.1
Ngarda-Ngarli-Yarndu	3,036	0.3	18.3	59.0	34.1
Nulla Wimila Kutju	3,846	8.7	8.1	59.3	30.2
Papunya	4,858	14.0	27.4	30.5	56.0
Patpa Warra Yunti	6,578	3.5	10.6	53.0	38.1
Peninsula	4,453	56.4	3.8	66.6	20.5
Queanbeyan	4,352	0	12.9	70.8	45.1
SE Qld Indigenous	11,436	0	13.4	60.2	37.2
Sydney	15,180	2.7	10.7	64.5	38.9
Tasmanian Regional	6,173	0.2	5.2	62.6	40.1
Townsville	7,995	11.6	13.6	55.4	37.8
TSRA	4,149	15.1	7.9	55.8	35.9
Tumbukka	6,173	3.5	6.9	68.4	37.8
Wangka-Wilurrara	1,012	25.6	9.7	70.2	27.6
Western Desert	1,822	22.5	7.4	49.6	32.6
Wongatha	1,619	0.9	15.0	53.7	28.8
Wunan	2,834	60.1	4.2	76.5	21.8
Yapakurlangu	2,125	24.6	13.5	59.4	34.3
Yilli Rreung	4,959	1.3	19.1	52.5	42.8
Australia	186,700	9.1	12.9	58.4	38.8

- Indigenous population from NATSIS is adjusted to 1995 levels using estimated residential populations.
- NATSIS estimates of proportion of CDEP scheme employment in the ATSI population 15 years and over.
- DSS data on unemployment-related benefits divided by ATSI population 15 years and over.
- NATSIS estimates of the Indigenous labour force divided by ATSI population 15 years and over.
- Proportion of unemployed (DSS) who indicate they have been out of work for more than 12 months.

Sources: ABS (1995a, 1995b) and unpublished DSS data.

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TO THE PRESIDENT AND THE BOARD OF TRUSTEES

FROM THE DEPARTMENT OF CHEMISTRY

RE: [Illegible]

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