THE AUSTRALIAN
NATIONAL UNIVERSITY

# CAEPR
# Centre for Aboriginal Economic Policy Research

## DISCUSSION PAPER

# The determinants of Indigenous employment outcomes: the importance of education and training

B. Hunter

No. 115/1996

ISSN 1036-1774
ISBN 0 7315 1789 X

## SERIES NOTE

The Centre for Aboriginal Economic Policy Research (CAEPR) was established in March 1990 under an agreement between The Australian National University (ANU) and the Aboriginal and Torres Strait Islander Commission (ATSIC). CAEPR operates as an independent research unit within the University's Faculty of Arts and is funded by ATSIC, the Commonwealth Department of Social Security and the ANU. CAEPR's principal objectives are to undertake research to:

- investigate the stimulation of Aboriginal and Torres Strait Islander economic development and issues relating to Aboriginal and Torres Strait Islander employment and unemployment;
- identify and analyse the factors affecting Aboriginal and Torres Strait Islander participation in the labour force; and
- assist in the development of government strategies aimed at raising the level of Aboriginal and Torres Strait Islander participation in the labour market.

The Director of the Centre is responsible to the Vice-Chancellor of the ANU and receives assistance in formulating the Centre's research priorities from an Advisory Committee consisting of five senior academics nominated by the Vice-Chancellor and four representatives nominated by ATSIC, the Department of Employment, Education, Training and Youth Affairs and the Department of Social Security.

CAEPR Discussion Papers are intended as a forum for the rapid dissemination of refereed papers on research that falls within the CAEPR ambit. These papers are produced for discussion and comment within the research community and Aboriginal affairs policy arena. Many are subsequently published in academic journals. Copies of discussion papers can be purchased from:

Centre for Aboriginal Economic Policy Research,
Faculty of Arts, The Australian National University, Canberra ACT 0200.
Ph (06) 279 8211 Fax (06) 249 2789.

Abstracts of all CAEPR Discussion Papers can be found at the following World Wide Web address:

http://coombs.anu.edu.au/WWWVLPages/AborigPages/CAEPR/caepr-home.html

**As with all CAEPR publications, the views expressed in this Discussion Paper are those of the author(s) and do not reflect an official CAEPR position.**

Professor Jon Altman
Director, CAEPR
The Australian National University
October 1996

## ABSTRACT

The National Aboriginal and Torres Strait Islander Survey provided a unique opportunity to re-examine the underlying determinants of Indigenous employment. The recent Centre for Aboriginal Economic Policy Research/Australian Bureau Statistics publication *Employment Outcomes for Indigenous People* emphasises the importance of education and training in securing better employment outcomes for Indigenous Australians. Regression analysis is used to highlight the large potential gains to Indigenous employment that can accrue through improved access to education. This paper argues that labour force statistics which compare Indigenous and non-Indigenous outcomes should be adjusted, using a simple technique, to account for the large differences in educational attainment in the respective population.

### Acknowledgments

I am clearly indebted to all the people who participated in the preparation of *Employment Outcomes for Indigenous People* including: Tony Barnes, Joan Cunningham, Kate Ross, John Taylor and Cathie Thorp. Special thanks to Roger Jones whose incessant badgering at several seminars provided the intellectual impetus for the second part of this paper. I would also like to thank Bruce Chapman, Ngaire Hosking, Will Sanders and John Taylor for their comments on earlier drafts. Editorial assistance was provided by Krystyna Szokalski, Linda Roach and Hilary Bek.

Boyd Hunter is a Post-Doctoral Fellow at the Centre for Aboriginal Economic Policy Research, Faculty of Arts, The Australian National University, Canberra.

Poor employment outcomes for Indigenous people have been one of the core concerns for government policy relating to Indigenous people for a very long time. While there was a marked improvement between the past two censuses, recent studies point to a reversal of this trend with negligible growth in Indigenous employment in the mainstream labour market between 1991 and 1994 (Taylor and Liu 1995; Australian Bureau of Statistics (ABS) 1996).

The 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) provides a unique opportunity to re-examine the underlying determinants of Indigenous employment. The recent Centre for Aboriginal Economic Policy Research (CAEPR)/ABS publication *Employment Outcomes for Indigenous People,* emphasises the importance of education and training in securing better employment outcomes for Indigenous Australians (ABS 1996). NATSIS also permits the analysis, for the first time, of relationships between employment and several social factors, including recent arrest and health, as well as quantifying the effect of the major determinants of employment, including education, training, demography and geography (ABS 1996).

This discussion paper provides a detailed review of the regression analysis in *Employment Outcomes for Indigenous People* (EOIP) to further debate on the Indigenous employment problem. While the technical results from EOIP are reproduced in Appendix A, this paper presents a more detailed interpretation of the implications for policy makers. New material is presented which underscores the importance of education in determining employment outcomes.

The primacy of education as an underlying determinant of Indigenous employment status means that it should be accounted for in even the most elementary analysis of Indigenous employment or, indeed, labour force status in general. Given the large differences in educational attainment between Indigenous and other Australians this paper suggests that all comparisons of labour force status should account for the proportional differences in each educational category.

## Data and methodology

The regression analysis in EOIP is merely a statistical description of the stylised relationships underlying Indigenous employment outcomes for NATSIS respondents. Multivariate techniques such as regression analysis allow the quantification of the strength of the relationship between various factors and employment after controlling for all other relevant factors. For example, regression techniques allow researchers to determine the extent to which education affects the chances of employment after controlling for other relevant factors.

Previous empirical research points to several major influences which, together, can largely explain Indigenous employment outcomes including education, demography, geography and other social factors (Daly 1995). NATSIS data provides several variables which capture these influences.

The influence of education on employment was included in three major forms: highest level of schooling completed, the highest educational qualification received and whether a person has attended a training course. Other studies have also found that poor English skills reduced the chances of being in employment (Jones 1991; Daly 1993, 1995). The ability to communicate in English was included as an additional measure of education because it is a fundamental job skill in the mainstream labour market.

The major demographic influence on employment status is the age variable which captures not only the effects of labour market experience on employment, but also broader life cycle effects. Other demographic factors such as the number of children may also influence employment outcomes. It is usually expected that having dependent children will increase the chances of females being outside the labour force and therefore having less opportunity to secure employment. However, the effect of dependent children on male employment is not so clear. Children may encourage a greater search effort to find employment or, by raising welfare entitlement, reduce the incentives to find employment. Nevertheless, in general, the presence of dependent children may increase the intensity of job search for persons, predominantly males, without child-rearing duties while reducing the intensity of job search for those with child-rearing responsibilities.

Geography is also an important determinant of employment outcomes for Indigenous people. Two measures of geography were used in this analysis. The first is the part-of-State variable used by the ABS which divides Australia into three categories according to settlement size and type: capital city, other urban, and rural. The second geographic variable measures whether the respondent lives in a household which is more than 100 kilometres away from a TAFE institution. This variable attempts to capture the extent to which opportunities for paid employment are limited in *very remote* areas.

The NATSIS also enables, for the first time, the examination of several social factors which may, directly or indirectly, influence the chance of employment. For example, was a history of arrest and poor health adversely related to the chances of employment? These factors are proxied by the experience of being arrested in the previous five years and whether individual respondents have a specified, long-term health condition.

The rise of the Community Development Employment Program (CDEP) scheme complicates the analysis of Indigenous employment because it can

be viewed as work and welfare (Sanders 1993). Given the uncertain status of CDEP scheme participation as a labour market state and that CDEP scheme employment forms a large component of total employment in many remote and rural areas, the regression models in EOIP were conducted separately for both total employment and non-CDEP scheme employment. The regression for non-CDEP scheme employment is estimated using a restricted sample which excludes CDEP scheme employees. This allowed the analysis to focus, specifically, on employment in the mainstream labour market.

## Summarising major impacts on Indigenous employment

The simplest way of summarising the major factors underlying employment from the regression results is to examine what happens to the chance of employment as the characteristics of Indigenous people are varied (Table 1). The affect of the changes in characteristics are measured relative to a hypothetical reference person who:

- completed schooling to year 10 or 11
- did not possess a post-school qualification
- had not completed a training course
- did not have difficulty speaking English
- was between 25 and 44 years of age
- did not have children
- resided in a capital city
- lived within 100 kilometres of a TAFE institution
- had not been arrested in the last five years and
- did not have a long-term medical condition.

The remainder of this section examines the determinants of all Indigenous employment (see Table 1, columns 2 and 4). The next section focuses solely on the determinants of non-CDEP scheme employment.

The first line of Table 1 indicates that the reference male has a 61.1 per cent chance of being employed in any job. The reference female has a 47.4 per cent chance of being employed. These probabilities of being employed reflect the overall conditions faced by the reference person. The rest of Table 1 addresses what happens to the chance of employment for this reference person as each of the major characteristics of this person varies.

The education variables are the largest single factor influencing Indigenous employment. Completing school to year 10 or year 11 increases the reference person's chance of being in employment relative to a person without any education by around 40 per cent. Completing year 12 further improves the chance of being in employment by 12.9 per cent for females, although the employment chances for males are not significantly affected.

**Table 1. The impact on employment of a change in selected characteristics, 1994.[a,b]**

| | Male | | Female | |
|---|---|---|---|---|
| | Total employment | Excluding CDEP | Total employment | Excluding CDEP |
| Reference person's employment probability | 61.1 | 60.8 | 47.4 | 52.2 |
| Change in probability resulting from a change in selected variables | | | | |
| Education and training | | | | |
| No education | -38.2 | -43.9 | -35.4 | -40.3 |
| Below year 6 | -17.2 | -16.6 | -14.0 | -15.9 |
| Years 6 to 9 | -8.4 | -8.9 | -13.7 | -18.3 |
| Year 12 | * | 9.8 | 12.9 | 14.4 |
| Any other qualifications | 13.0 | 15.1 | 20.8 | 21.3 |
| Any vocational | 18.1 | 21.3 | 14.9 | 18.0 |
| Diploma/degree | 17.6 | 18.2 | 22.5 | 23.2 |
| English difficulty | * | * | * | -11.7 |
| Training | 9.4 | 11.7 | 11.1 | 12.8 |
| Demographics | | | | |
| Age 15-24 years | -8.8 | -13.7 | -12.5 | -18.6 |
| Age 45-64 years | * | * | * | * |
| One child | 5.3 | 5.6 | -8.0 | -9.7 |
| Two or three children | * | * | -17.2 | -20.0 |
| Four or more children | -6.6 | -9.9 | -26.0 | -32.8 |
| Geography | | | | |
| Other urban area | -7.0 | -9.8 | -8.8 | * |
| Rural area (<1,000 people) | * | -10.2 | * | -14.0 |
| Over 100 km from nearest TAFE | 12.9 | * | 14.2 | * |
| Social/other factors | | | | |
| Arrested in previous five years | -20.1 | -26.5 | -17.7 | -25.8 |
| Reported a health condition | -7.3 | -5.8 | * | * |

a. Predicted probabilities are calculated from equation A2 in Appendix A.
b. The reference person is defined as a resident of a capital city who completed schooling to year 10 or 11, does not have children, does not possess a post-school qualification, has not completed a training course, does not have difficulty speaking English, lives within 100 kilometres of a TAFE institution, and has not been arrested in the last five years.
* Denotes that the coefficient which this probability is based on is not significantly different from zero at the 5 per cent level.

Source: ABS (1996).

The other important aspect of an individual's education is the level of qualification. Having a qualification increases the chances of employment by between 13.0 and 22.5 per cent. It is interesting to note that vocational qualifications tend to increase males' chances of employment as much as a diploma or degree, relative to males without qualifications. The reason for

this is that the regression analysis has already controlled for the higher level of secondary schooling that males with degrees will have. For females, this apparent anomaly does not arise because vocational training is not as significant as a diploma and degree.

Doing any study or training courses in the last year also significantly increases the chances of being employed. Males who undertook a training course are 9.4 per cent more likely to have employment. For females, training increases the chances of employment by about 11.1 per cent.

The influence of the age variables indicate that the pattern of employment is similar to other analyses of labour force status. Such studies indicate that labour market experience increases the chances of employment initially, but as a person gets older the specific and general training embodied in the person becomes redundant or atrophies, and the chances of employment may eventually decline. Accordingly, the employment rate in Table 1 increases till Indigenous people reach the prime age group (25 to 44 years of age). The employment rate then falls away in the older age groups. However, the regression results indicate that this decline in employment for the older Indigenous population is not significant once other characteristics such as lower levels of education are taken into account. The overall results are consistent with the conventional view in labour economics that age is a rough proxy for labour market experience.

The number of children has an influence on employment which is consistent with both economic theory and social reality. As in the community at large, the presence of children tends to reduce the employment prospects of females who bear the major responsibility for child-rearing. Their probability of employment decreases as the number of children increases. Indigenous males with only one child are actually more likely to secure employment than those without children. However, the presence of large numbers of children tends to reduce male employment prospects.

The influence of location on the overall chances of employment has an interesting pattern which contrasts with other studies of employment. Indigenous people in rural areas have a similar chance of employment to Indigenous people in capital cities. The higher chance of employment in rural areas compared to other urban areas is particularly surprising given the presumably better access to the mainstream labour market in such urban areas. It would appear that employment in the CDEP scheme more than compensates for the adverse demand conditions usually expected in rural areas.

Distance to TAFE college is a measure of remoteness. Living in a household which is more than 100 kilometres from TAFE facilities increases the chances of being in employment by about 12.9 and 14.2 per

cent for males and females respectively. At first glance, the result seems to be a contradiction. However, the result is reminiscent of that for rural areas. Since almost all urban areas will be within 100 kilometres of a TAFE college, this variable is largely picking up the remoteness of rural communities. Therefore it is not surprising that this variable reflects the results noted earlier for rural communities. The availability of the CDEP scheme in remote areas appears to provide the countervailing influence on the poor demand conditions which usually prevail in these areas. The next section presents evidence that the CDEP scheme is driving this result.

The nexus between social factors and employment is extremely complex and it is therefore difficult to make any definitive statement as to the direction of causality. Notwithstanding this qualification, social factors are likely to play an important role in determining Indigenous employment outcomes. For example, the experience of arrest in the previous five years, or 'recent arrest' is probably driving the relationship between arrest and employment because the history of arrest will, in most cases, be determined before NATSIS was conducted. That is, the current employment status is not likely to be determining the history of arrest which is, by definition, largely pre-determined.

Recent arrest is the most important of the two social factor variables used. Recent arrest is related to a reduction in the chances of employment by 20.1 and 17.7 per cent for males and females respectively.

The influence of recent arrest may be capturing some unobserved characteristics of the individuals.[1] Such arguments place a lot of emphasis on the supply-side influences on employment and ignore the fact that Indigenous employment is largely constrained by the demand-side of the labour market. Notwithstanding the possibility that recent arrest is a proxy for other characteristics, the magnitude of the effect of recent arrest means that policy makers cannot afford to ignore it.

If we assume that the historical nature of the recent arrest variable means that arrest drives poor employment outcomes, then a reduction of arrest rates amongst Indigenous people would be likely to have a major affect in improving Indigenous employment outcomes. ABS (1996) showed that almost 50 per cent of teenage Indigenous males had been arrested in the past five years. Therefore, even before the effects of CDEP scheme employment are accounted for, about 10 percentage points of the lower employment-population ratios for males aged between 15 and 19 years could be associated with these exceptionally high rates of arrest. If average arrest rates for males aged between 15 and 24 years (32 per cent) were equivalent to the level of arrest of the older males (15 per cent) or even the entire working-age female population (11 per cent), then the average youth employment rates may improve by about 5 per cent.

However, as noted above, the regression analysis may indicate that poor employment is causing higher arrest rates not vice versa. Even if employment is driving arrest, the measured association underscores the importance of the recommendations of the Royal Commission into Aboriginal Deaths in Custody to improve employment in order to reduce the excessively high rates of incarceration (Commonwealth of Australia 1991). To the extent that the above results indicate that employment affects Indigenous arrest rates there are large potential improvements that may be made by improving Indigenous employment outcomes.[2] Indeed, if the direction of causality is reversed so that employment drives arrest, then this further heightens the importance of addressing Indigenous education in order to improve employment and therefore arrest rates.

Having a long-term health condition also has a significant negative relationship with Indigenous employment outcomes for males, producing a significant reduction of 7.3 per cent in the chances of employment. While the relationship between health and employment is not as large as for the other variables it is potentially very important for older Indigenous people who have particularly poor health.

The cross-sectional evidence from NATSIS indicates that the higher propensity to report a long-term health condition in older Indigenous people may help to explain some of the apparent decline in the employment rates towards the end of the working life cycle. This is not surprising given that long-term health conditions among the older population were 30 per cent higher than among 15 to 24 year olds. After accounting for these differences in health status, about 3 per cent of the lower employment rates among 45 to 64 year old males compared to the younger males was associated with this decline in health. However, only 1 per cent of the decline in employment rates over the female life cycle can be associated with the worse health of older Indigenous women.[3]

The potential causality problems for the arrest and health variables means that more sophisticated statistical analysis needs to be conducted to inform policy decisions.[4] Given the significance and size of the effect of social factors in Table 1, such analysis should be given a high priority in future research using NATSIS data.

## Focusing on the mainstream labour market: non-CDEP scheme employment

The limited availability of survey data on CDEP scheme and other employment has constrained the ability to study differences in the two types of employment. NATSIS data provides the first opportunity to examine what determines whether Indigenous people are employed in the mainstream labour market. Table 1 presents a regression analysis of the

chances of being in non-CDEP employment rather than CDEP scheme employment.

It is important to distinguish employment in the CDEP scheme from other employment, given that the processes which determine CDEP scheme employment are likely to be substantially different to the processes for other employment. For example, CDEP scheme employment is crucially dependent upon whether or not the scheme is available in the local community, and the availability of CDEP jobs will be largely independent of the wage on offer in the local area.

Supply-side and demand-side factors will have a substantially different impact on CDEP scheme and other employment, and will probably have a greater impact on the latter. Indeed, if the availability of CDEP is dependent on local employment demand conditions, then the scheme will weaken the relationship between employment and the market forces of supply and demand. That is, if CDEP scheme employment is institutionally driven, then the results reported in the previous section will underestimate the impact of the various factors on non-CDEP scheme employment. Since CDEP scheme employment will be relatively unaffected by the productivity of individual workers, the factors which augment productivity, such as education, would be expected to have a larger impact on mainstream employment than total employment.

Table 1 confirms the earlier speculation that CDEP scheme employment is an important source of employment in other urban and, particularly, rural areas. Indeed, the direction of the effect on male employment of living in a rural area is reversed when CDEP scheme employment is excluded. That is, while males have a higher chance of being employed in rural areas rather than capital cities, they have a lower chance of being employed in mainstream employment. Also, the distance from TAFE variable, which proxies very remote areas is no longer significant when the analysis is focused on mainstream employment. These results provide further evidence that CDEP scheme employment substitutes for employment in the mainstream labour market in remote and rural areas (see Altman and Hunter 1996a, 1996b). This result is also consistent with research into non-Indigenous employment which generally supports the notion of labour markets being less developed outside major urban centres.[5]

In general, mainstream employment increases with those factors which improve employment demand and labour supply. Therefore, with the exception of the geography variables noted above, the impact of the underlying determinants are strengthened by excluding CDEP scheme employment. For example, the qualification variables increase non-CDEP scheme employment by between 15.1 and 23.2 per cent instead of between 13.0 and 22.5 per cent. The juxtaposition of the effects for total employment and non-CDEP scheme employment illustrates the enhanced

impact of education on mainstream employment. Clearly, failure to account for the differential impact on CDEP scheme and other employment will systematically undervalue the education of the Indigenous population.

One of the major findings of the regression analysis is that it is not possible to understand Indigenous employment outcomes without a full understanding of the processes and institutions of the CDEP scheme. Therefore future analysis of Indigenous labour force status must avail itself of surveys like NATSIS which adequately distinguish CDEP scheme from other employment. The inclusion of a CDEP identifier in the 1996 Census will enable the important distinction between mainstream and other employment to be made in future research.

## Implications for measurement of Indigenous labour force status

In order to draw policy implications about Indigenous employment or trends in Indigenous employment, the results from the NATSIS suggest that it is advisable to disaggregate changes in education from other changes. For example, given that the educational attainment of the Indigenous population is substantially lower than in the population at large (Table 2), it is important to attempt to control for such differences when comparing Indigenous and non-Indigenous labour force outcomes. This paper suggests several simple procedures to render such comparisons more meaningful and enable the comparison of 'like-with-like'.

**Table 2. Distribution of educational qualifications, 1991.**

| | Degree | Diploma | Certificate | No qualification | Other | Total | Number |
|---|---|---|---|---|---|---|---|
| Male | | | | | | | |
| Indigenous | 0.5 | 0.5 | 4.6 | 87.0 | 7.4 | 100 | 131,487 |
| Non-Indigenous | 6.6 | 3.0 | 16.5 | 65.1 | 8.9 | 100 | 8,231,306 |
| Female | | | | | | | |
| Indigenous | 0.6 | 1.2 | 2.0 | 88.4 | 7.8 | 100 | 134,101 |
| Non-Indigenous | 5.4 | 5.2 | 4.9 | 73.9 | 10.5 | 100 | 8,354,017 |

Source: Full sample of Indigenous population and the 1 per cent sample for the non-Indigenous population from 1991 Censuses.

The large difference in the distribution of educational qualifications of Indigenous and other Australians arises because a larger number of Indigenous people have no qualification. For males, 87.0 per cent have no qualifications compared to 65.1 per cent in the population at large. The difference is somewhat smaller for the female population largely because

non-Indigenous females have acquired fewer qualifications than their male counterparts. The failure to account for such large differences when comparing the two populations means that conclusions will not be very meaningful given that qualified people are being compared to unqualified people.

**Table 3. Unadjusted probability of employment by qualification, 1991.**

| | Degree | Diploma | Certificate | No qualification | Other |
|---|---|---|---|---|---|
| Male | | | | | |
| Indigenous | 0.884 | 0.858 | 0.723 | 0.421 | 0.432 |
| Non-Indigenous | 0.858 | 0.813 | 0.772 | 0.582 | 0.524 |
| Female | | | | | |
| Indigenous | 0.809 | 0.756 | 0.594 | 0.263 | 0.31 |
| Non-Indigenous | 0.767 | 0.694 | 0.646 | 0.415 | 0.377 |

Source: Full sample of Indigenous population and the 1 per cent sample for the non-Indigenous population from 1991 Censuses.

The simplest procedure for incorporating this difference when making comparisons between Indigenous and non-Indigenous employment is to calculate the average employment/population ratios for people with the respective levels of educational attainment (Table 3). For example, simply by estimating the employment in each level of educational qualification it is possible to identify that the majority of difference in employment outcomes arises from the relatively poor employment of those Indigenous people without any qualifications. While it is no doubt true that some of this difference arises because of the differing level of high school retention and completion in the respective unqualified populations, Table 3 does provide a rough indication of where the major disadvantage of Indigenous people lies and highlights the need to make valid comparisons between similar groups of Australians.

The importance of comparing 'like-with-like' is underscored by the similarity of employment among Indigenous and non-Indigenous people with degrees. While the relatively high employment for Indigenous graduates may be artificially generated by the demand for highly qualified personnel in bureaucracies with a specific focus on Indigenous affairs, such as the Aboriginal and Torres Strait Islander Commission and the Office of Indigenous Affairs in the Department of Prime Minister and Cabinet, the similarities in the rates of employment in the 1991 Census is remarkable.

**Table 4. Employment/population ratios after accounting for low levels of qualifications in the Indigenous population.**

| | Hypothetical Indigenous ratio[a] with non-Indigenous levels of qualifications Per cent | Actual Indigenous ratio Per cent | Actual non-Indigenous ratio Per cent |
|---|---|---|---|
| Male | 45.4 | 59.6 | 65.1 |
| Female | 29.5 | 42.8 | 46.9 |

a. The hypothetical employment/population ratio based on the assumption that the Indigenous population had the same distribution of educational qualifications to those observed in the non-Indigenous population.

Source: Full sample for the Indigenous population and the 1 per cent sample for the non-Indigenous population from 1991 Censuses.

An alternative method of adjusting employment for Indigenous and other Australians also utilises a simple cross-tabulation of employment and education for the respective populations. Table 4 reports the hypothetical employment/population ratio based on the assumption that the Indigenous population had the same distribution of educational qualifications as those observed in the non-Indigenous population, and vice versa. That is, the employment/population ratios in Table 3 are weighted by the various distributions of educational qualifications reported in Table 2.[6] While this technique is more basic than the procedure used in a regression context, it provides useful insights into basic trends in Indigenous labour force status.[7]

Using this procedure of cross-tabulating employment and qualifications it is estimated that, if Indigenous males continued to secure employment at the same rate after achieving the proportions of educational qualifications enjoyed by other Australians, then they would experience an employment/population ratio of about 54.5 per cent.[8] That is, of the 19.7 percentage point difference in employment/population ratios between Indigenous and non-Indigenous males, 9.1 percentage points can be explained by simply allowing the Indigenous population to have the same level of educational qualification as in the rest of the Australian population.[9] This confirms the importance of education with almost a half of the difference in employment between Indigenous and non-Indigenous males explained by differences in qualifications. While educational qualifications are slightly less important for females, they can explain as much as 38.4 per cent of the overall difference in employment/population ratios.[10]

It is easy, in theory, to use this procedure to examine any labour force status or trends in labour force status.[11] The large difference in the distribution of education means that part-time or full-time employment and unemployment statistics should be similarly adjusted.

## Conclusion

Education is the largest single factor associated with the current poor outcomes for Indigenous employment. Indeed, the influence of education dwarfs the influence of most demography, geography and social variables.

Notwithstanding the strong association between Indigenous employment and education, it is possible that some, or even conceivably all, of this association is due to employers' use of education as a screening device.[12] That is, if employers use education to identify those people with high ability, then the measured association merely reflects that fact. However, even if education is merely a screening device it can be considered a valuable method of identifying potentially productive workers. For example, if education is a screening device and Indigenous workers have a similar distribution of ability to that observed in the non-Indigenous population, the low levels of education means that Indigenous workers are currently being undervalued by employers. Therefore increasing education will redistribute employment towards Indigenous workers as employers recognise their true ability.

Education is clearly important for the Indigenous labour force irrespective of whether it improves the productivity of individual workers or identifies those who are most likely to be productive. Accordingly, the improvement of Indigenous retention in schools and tertiary institutions should be accorded the highest priority in order to promote greater employment equity among Australians.

Unlike other studies, this paper illustrates that policy makers cannot ignore general social factors in the Indigenous community. For example, the employment impact of the recent arrest of many Indigenous people, especially the teenage Indigenous population, cannot be ignored. However, while the preceding analysis establishes the magnitude of the effects of recent arrest and poor health, such social factors are extremely complex and require a sophisticated, separate analysis to enable considered policy judgements to be made.

The regression analysis in EOIP also highlights the fact that it is not possible to understand Indigenous employment outcomes without understanding institutional factors such as the delivery of the CDEP scheme or the judicial processes which incarcerate so many young Indigenous males. Therefore, future analysis of Indigenous labour force status must avail itself of data which adequately distinguish CDEP scheme from other employment.

The expansion of the CDEP scheme also raises the issue of the appropriateness of existing labour force categories as a means of describing the true position of many Indigenous people. Previous research

which failed to distinguish CDEP scheme and other employment may understate the benefits of education for the Indigenous population in terms of employment. Therefore, where a mainstream labour market is viable, improvements in education and training are likely to be more important than previously estimated (Daly 1995).

This paper highlights the importance of attempting to control for differences in educational attainment when comparing Indigenous and non-Indigenous labour force outcomes or examining trends in Indigenous employment. Controlling for educational differences in employment statistics enables policy makers to make valid comparisons between like individuals and helps researchers to focus explicitly on education policy as a means of improving Indigenous outcomes. Controlling for such differences does not require a regression analysis and can be conducted simply by generating a cross-tabulation of employment by educational attainment. Elementary analysis like this may overemphasise the similarities between Australians by failing to distinguish important differences in other determinants of employment, but it does provide a useful, more accurate basis for comparison of the two populations than the raw employment statistics.

Indeed, the principle of controlling for educational differences in labour force statistics can, and should, be utilised in comparisons of other labour force states including unemployment and full- or part-time employment. By comparing 'like-with-like', valid conclusions among all labour force states, education and other policy matters will be better informed by a more comprehensive, complete and focused analysis. The unfocused examination of employment statistics tends to overstate the importance of discrimination in Indigenous employment rather than examining the positive employment outcomes which can be made through education policy.

**Notes**

1. See Gale, Bailey-Harris and Wundersitz (1990) for detailed discussion of the characteristics of Indigenous youth who have been involved with the criminal justice system.

2. This assumption implies that an increase in male teenage employment by 5 percentage points would reduce arrest rates for that group to those experienced by Indigenous females.

3. The association between employment and the health proxy is not significant for women in the Appendix and is therefore not reported in Table 1. It is merely reported here to illustrate that it is not a large factor.

4. For example, instrumental variables or a 'Heckman' correction procedure are two possible procedures which could help to identify the direction of causality (see Heckman 1979).

5. The limited availability of jobs in many remote areas tends to increase out-migration rates so that the much of the remaining non-Indigenous population are employed. The labour markets that exist in remote areas tend to preclude many Indigenous people from securing employment because they require highly skilled workers with specific training (see Altman and Hunter 1996b).

6. This technique is widely used in demography to standardise means of populations with differing age structures (Cox 1976: 295). Chapman (1991) suggests that it is necessary to take account of the different probabilities of employment in urban, rural and remote locations.

7. The procedure used in the regression analysis is often called the Blinder/Oxaca decomposition which decomposes the average difference between two groups into an endowment and coefficient component (see Daly 1995). The advantage of the regression based procedure is that it allows us to control for other relevant factors.

8. If we assume that the non-Indigenous males had the same distribution of qualifications as Indigenous males but secured employment at the same rate, then they would experience an employment/population ratio of about 59.6 per cent (Table 4). While this represents a reduction in the amount of the average differential that can be explained by qualifications it is, nonetheless, a substantial explanator which cannot be ignored.

9. The employment/population ratios for non-Indigenous and Indigenous males are 65.1 and 45.4 per cent respectively.

10. The lower explanatory power of education endowments among females is probably related to the increased importance of the presence of children for females.

11. The practical impediment to applying this procedure arises because of the different categories used for the respective surveys and censuses. For example, NATSIS and census categories are not precisely comparable and this makes the appropriate adjustment somewhat difficult.

12. It can be argued that the influence of screening on Indigenous employment is even more important than it is for non-Indigenous employment. According to this argument, the smaller number of highly educated Indigenous people means that only those people with exceptionally high ability get educated.

## Appendix A. Logistic regression analysis of Indigenous employment

The regression analysis in ABS (1996) models two distinct employment variables: the first dependent variable is employment as opposed to non-employment; the second regression model also uses employment but is confined to the population who are not engaged in CDEP scheme employment.

This Appendix has two subsections. The first revises the methodological discussion of the mechanics of the logistic statistical models. The second section presents the results in their raw form and comments briefly on the results.

### The statistical model

Logistic regressions can be best explained in the binomial case where the dependent variable has two possible values: for example, employed and not-employed. To overcome the fact that this is a limited dependent variable, a logit transformation is used to ensure that the predicted probabilities lie between zero and one. The basic formulation of the logistic regression model is

$$Logit\ P_i = \log\left(\frac{P}{(1-P)}\right)_i = bX_i + e_i \qquad \text{(A1)}$$

where b is a coefficient vector, the variables $X_i$ and $e_i$ the error term which approximates a multi-variate normal distribution (see Hosmer and Lemeshow (1989) and Agresti (1990) for fuller discussions). Logit P, which is also known as the log odds ratio, is the dependent variable in the logistic regression. The logistic regression models are estimated using maximum likelihood estimation techniques.

The coefficients from the binomial logistic regression are converted into probability values using the formula:

$$P = \frac{e^{\log it\ P}}{\left(1+e^{\log it\ P}\right)} \qquad \text{(A2)}$$

The binomial logistic model is frequently preferred in empirical studies because of the relative ease of interpreting its coefficients. Hosmer and Lemeshow (1989) show that the log odds, or rather the natural log of the odds ratio, equals the individual coefficient of the respective variables. Therefore, for example, if we are interested in the affect of arrest on employment, then a negative coefficient of minus one implies that employment is less likely among Indigenous people who have been arrested recently. Indeed, this coefficient can be used to calculate the odds ratio of recent arrest by raising the natural exponent, *e*, to the power of minus one or 0.37. That is, if a person has been arrested in the last five years then they are about a third less likely to be employed than they would be if they had avoided arrest.

The coefficients of the binomial model of non-CDEP scheme employment have an analogous interpretation. That is, the relevant coefficient in that model can be used to calculate the odds ratio of being in non-CDEP employment given that the variable being examined is true.

### Estimation results

The results of the two binomial logistic regression models are presented in Tables A1 and A2. The regression coefficients for the logistic regression are quite difficult to

interpret at first glance. The reason is that the coefficients in a logistic regression model measure relative probabilities of being in particular states. This section gives a brief description of the interpretation of the coefficients in this appendix.

*Estimating the overall determinants of employment*
The results of the first binomial regression model, which focuses on employment irrespective of whether the person is employed in the CDEP scheme, are presented in Table A1.

**Table A1. Binomial logistic regression of employment/non-employment.**

| Variable | Male estimate | Male (s.e.) | Male odds ratio | Female estimate | Female (s.e.) | Female odds ratio |
|---|---|---|---|---|---|---|
| Intercept | 0.452 | 0.111 | | -0.106 | 0.112 | |
| Education and training | | | | | | |
| No education | -1.667 | 0.240 | 0.19 | -1.892 | 0.281 | 0.56 |
| Below year 6 | -0.695 | 0.186 | 0.49 | -0.588 | 0.204 | 1.69 |
| Years 6 to 9 | -0.344 | 0.083 | 0.71 | -0.571 | 0.088 | 0.57 |
| Year 12 | 0.256 | 0.143 | 1.29 | 0.522 | 0.119 | 0.49 |
| Any other qualifications | 0.600 | 0.163 | 1.82 | 0.869 | 0.164 | 2.92 |
| Basic or skilled vocational | 0.887 | 0.123 | 2.43 | 0.605 | 0.134 | 1.85 |
| Diploma/degree | 0.853 | 0.255 | 2.35 | 0.980 | 0.161 | 2.66 |
| Had training | 0.422 | 0.110 | 1.53 | 0.446 | 0.111 | 1.78 |
| Has difficulty with English | -0.135 | 0.114 | 0.87 | -0.208 | 0.121 | 0.81 |
| Demography | | | | | | |
| Age 15 to 24 years | -0.358 | 0.087 | 0.70 | -0.518 | 0.091 | 0.59 |
| Age 45 to 64 years | -0.178 | 0.112 | 0.84 | -0.010 | 0.114 | 1.00 |
| One child | 0.231 | 0.101 | 1.26 | -0.327 | 0.097 | 2.19 |
| Two or three children | 0.151 | 0.093 | 1.16 | -0.732 | 0.095 | 0.79 |
| Four or more children | -0.274 | 0.135 | 0.76 | -1.200 | 0.159 | 0.50 |
| Geography | | | | | | |
| Other urban area | -0.287 | 0.092 | 0.75 | -0.363 | 0.090 | 0.74 |
| Rural | 0.091 | 0.110 | 1.10 | -0.079 | 0.110 | 1.06 |
| Distance to TAFE 100 km | 0.596 | 0.101 | 1.82 | 0.578 | 0.102 | 0.32 |
| Social factors | | | | | | |
| Arrested in previous 5 years | -0.817 | 0.079 | 0.44 | -0.760 | 0.136 | 0.47 |
| Long-term health condition | -0.300 | 0.079 | 0.74 | -0.135 | 0.077 | 0.87 |
| Number of observations | 3,493 | | | 4,173 | | |

s.e. Standard error.

Source: ABS (1996).

Rather than dwell on the sign of individual coefficients, which are effectively analysed more fully in the text, this appendix will briefly examine the odds ratios implied by the coefficients, as these are slightly more complex to understand. The signs of the coefficients in Table A1, are largely consistent with those predicted by economic theory. For instance, education and training increased the probability of being in employment. For females, certain qualification, almost tripled the likelihood of being in employment relative to those without qualification. The demographic variables have a similar effect to the usual experience variable used by labour economists.

The experience of arrest in the previous five years also has a marked effect on the probability of being in employment. Being arrested appears to reduce the probability of being in employment by a factor of three for both males and females.

The effects of the CDEP scheme are likely to be affecting the results for the geography variables. While most of the other coefficients in Table A1 do not contradict the theoretical expectation, they may also be affected in a similar way to the geographic variables. The second binomial model of employment is a necessary supplement to Table A1 to eliminate the effect of CDEP on the determinants of overall employment.

*Estimating the determinants of non-CDEP scheme employment*
The second binomial model estimates the probability of being in non-CDEP employment but eliminates all those in CDEP scheme employment (Table A2). This limitation on the sample being examined can be justified on the grounds that CDEP scheme cannot be easily classified in the usual labour force states. The focus on non-CDEP employment ensures that the results are symmetrical with those presented in Table A1.

**Table A2. Binomial logistic regression of non-CDEP employment versus no employment, Indigenous males and females aged 15-64 years who are not in CDEP scheme employment.**

| Variable | Male estimate | Male (s.e.) | Male odds ratio | Female estimate | Female (s.e.) | Female odds ratio |
|---|---|---|---|---|---|---|
| Intercept | 0.439 | 0.125 | | 0.088 | 0.123 | |
| Education and training | | | | | | |
| No education | -2.029 | 0.368 | 0.13 | -2.094 | 0.402 | 0.12 |
| Below year 6 | -0.671 | 0.216 | 0.51 | -0.649 | 0.230 | 0.52 |
| Years 6 to 9 | -0.362 | 0.097 | 0.70 | -0.757 | 0.102 | 0.47 |
| Year 12 | 0.435 | 0.158 | 1.55 | 0.601 | 0.130 | 1.82 |
| Any other qualification | 0.707 | 0.179 | 2.03 | 0.932 | 0.177 | 2.54 |
| Basic or skilled vocational | 1.083 | 0.133 | 2.96 | 0.767 | 0.141 | 2.15 |
| Diploma/degree | 0.884 | 0.273 | 2.42 | 1.032 | 0.170 | 2.81 |
| Had training | 0.531 | 0.122 | 1.70 | 0.532 | 0.118 | 1.70 |
| Has difficulty with English | -0.273 | 0.143 | 0.76 | -0.472 | 0.155 | 0.62 |
| Demographics | | | | | | |
| Age 15 to 24 years | -0.554 | 0.104 | 0.58 | -0.771 | 0.107 | 0.46 |
| Age 45 to 64 years | -0.116 | 0.127 | 0.89 | -0.011 | 0.128 | 0.99 |
| One child | 0.243 | 0.119 | 1.28 | -0.389 | 0.110 | 0.68 |
| Two or three children | 0.196 | 0.107 | 1.22 | -0.831 | 0.108 | 0.44 |
| Four or more children | -0.401 | 0.164 | 0.67 | -1.513 | 0.201 | 0.21 |
| Geography | | | | | | |
| Other urban area | -0.397 | 0.102 | 0.67 | -0.510 | 0.966 | 0.60 |
| Rural | -0.414 | 0.126 | 0.66 | -0.582 | 0.126 | 0.56 |
| Distance to TAFE 100 km | 0.025 | 0.126 | 1.03 | 0.224 | 0.125 | 1.25 |
| Social factors | | | | | | |
| Arrested in previous 5 years | -1.089 | 0.097 | 0.34 | -1.112 | 0.170 | 0.33 |
| Long-term health condition | -0.239 | 0.092 | 0.79 | -0.130 | 0.868 | 0.88 |
| Number of observations | 2,804 | | | 3,790 | | |

s.e. Standard error.

Source: ABS (1996).

Given that CDEP employment is largely concentrated in rural and remote areas with historically poor access to mainstream labour markets, the result that living outside capital cities tends to reduce the probability of being in mainstream labour markets is not surprising. As the geographic variables are coded to reflect the degree of remoteness of the local area, the strong negative impact on non-CDEP scheme employment relative to overall employment implies that the CDEP scheme can be thought of as providing an effective substitute employment source for a persistently depressed labour market in such areas.

The other systematic tendency in Table A2 is that variables which increase either demand or supply-side factors tend to increase in significance once CDEP scheme employment has been eliminated. For example, the education variables have a larger impact in Table A2 than in Table A1 because an individual's education will have a limited impact on CDEP scheme employment which is determined at the community level.

**References**

Agresti, A. 1990. *Categorical Data Analysis*, Wiley, New York.

Altman, J.C. and Sanders W. 1991. 'The CDEP scheme: administrative and policy issues', *Australian Journal of Public Administration*, 50 (4): 515-25.

Altman, J.C. and Hunter, B. 1996a. 'The comparative economic status of CDEP and non-CDEP community residents in the Northern Territory in 1991', *CAEPR Discussion Paper No. 107*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Altman, J.C. and Hunter, B. 1996b. 'The geographic distribution of unemployment-related benefits for Indigenous people and inter-relationships with CDEP-scheme employment', *CAEPR Discussion Paper No. 112*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Australian Bureau of Statistics (ABS) 1996. *National Aboriginal and Torres Strait Islander Survey 1994: Employment Outcomes for Indigenous People*, cat. no. 4199.0, ABS, Canberra.

Chapman, B.J. 1991. 'Aboriginal employment, income and human capital: towards a conceptual framework', in J.C. Altman (ed.) *Aboriginal Employment Equity by the Year 2000*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Commonwealth of Australia 1991. *Royal Commission into Aboriginal Deaths in Custody, National Report*, vol. 2, Australian Government Publishing Service, Canberra.

Cox, P.R. 1976. *Demography*, Cambridge University Press, Cambridge.

Daly, A.E. 1993. 'The determinants of employment for Aboriginal people', *Australian Economic Papers*, 32 (60): 134-51.

Daly, A.E. 1995. *Aboriginal and Torres Strait Islander People in the Australian Labour Market*, Australian Bureau of Statistics, cat. no. 6253.0, Australian Government Publishing Service, Canberra.

Gale, F., Bailey-Harris, R. and Wundersitz, J. 1990. *Aboriginal Youth and the Criminal Justice System: The Injustice of Justice*, Cambridge University Press, Cambridge.

Greene, W.H. 1990. *Econometric Analysis*, Macmillan, New York.

Heckman, J.J. 1979. 'Sample selection as a specification error', *Econometrica*, 47 (1): 153-62.

Hosmer, D.W. and Lemeshow, S. 1989. *Applied Logistic Regression*, Wiley, New York.

Jones, F.L. 1991. 'Economic status of Aboriginal and other Australians: a comparison', in J.C. Altman (ed.) *Aboriginal Employment Equity by the Year 2000*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Sanders, W. 1993. 'The rise and rise of the CDEP scheme: an Aboriginal 'workfare' program in times of persistent unemployment', *CAEPR Discussion Paper No. 54*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Taylor, J. and Liu, J. 1995. 'Changes in the relative distribution of Indigenous employment by industry, 1986-96', *CAEPR Discussion Paper No. 96*, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

## CENTRE FOR ABORIGINAL ECONOMIC POLICY RESEARCH (CAEPR)

## MONOGRAPHS

1. *Aborigines in the Economy: A Select Annotated Bibliography of Policy-Relevant Research 1985-90*, L.M. Allen, J.C. Altman and E. Owen (with assistance from W.S. Arthur), 1991.

2. *Aboriginal Employment Equity by the Year 2000*, J.C. Altman (ed.), published for the Academy of the Social Sciences in Australia, 1991.

3. *A National Survey of Indigenous Australians: Options and Implications*, J.C. Altman (ed.), 1992.

4. *Indigenous Australians in the Economy: Abstracts of Research, 1991-92*, L.M. Roach and K.A. Probst, 1993.

5. *The Relative Economic Status of Indigenous Australians, 1986-91*, J. Taylor, 1993.

6. *Regional Change in the Economic Status of Indigenous Australians, 1986-91*, J. Taylor, 1993.

7. *Mabo and Native Title: Origins and Institutional Implications*, W. Sanders (ed.), 1994.

8. *The Housing Need of Indigenous Australians, 1991*, R. Jones, 1994.

9. *Indigenous Australians in the Economy: Abstracts of Research, 1993-94*, L.M. Roach and H.J. Bek, 1995.

10. *The Native Title Era: Emerging Issues for Research, Policy and Practice*, J. Finlayson and D.E. Smith (eds), 1995.

For information on earlier CAEPR Monographs please contact Publication Sales, Centre for Aboriginal Economic Policy Research, Faculty of Arts, Australian National University, Canberra ACT 0200. Phone (06) 279 8211 Fax (06) 249 2789. Abstracts of all CAEPR Publications can be found at the following WWW address: http://coombs.anu.edu.au/WWWVLPages/AborigPages/CAEPR/caepr-home.html.

## CENTRE FOR ABORIGINAL ECONOMIC POLICY RESEARCH (CAEPR)

## RECENT DISCUSSION PAPERS

86/1995 *Negotiations between mining companies and Aboriginal communities: process and structure*, C. O'Faircheallaigh.

87/1995 *Aboriginal employment, native title and regionalism*, J. Finlayson.

88/1995 *Native Title Act 1993: implementation issues for resource developers*, J.C. Altman.

89/1995 *Beyond native title: multiple land use agreements and Aboriginal governance in the Kimberley*, P. Sullivan.

90/1995 *Australian fiscal federalism and Aboriginal self-government: some issues of tactics and targets*, W. Sanders.

91/1995 *Enumerating the Aboriginal population of remote Australia: methodological and conceptual issues*, D.F. Martin and J. Taylor.

92/1995 *Twenty years of policy recommendations for indigenous education: overview and research implications*, R.G. Schwab.

93/1995 *The economic status of indigenous Australian families*, A.E. Daly and D.E. Smith.

94/1995 *Equity for Aboriginal families in the 1990s: the challenges for social policy*, J. Finlayson.

95/1995 *Native title and indigenous Australian utilisation of wildlife: policy perspectives*, J.C. Altman, H.J. Bek and L.M. Roach.

96/1995 *Change in the relative distribution of indigenous employment by industry, 1986-91*, J. Taylor and Liu Jin.

97/1995 *Estimating the private rate of return to education for indigenous Australians*, A.E. Daly and Liu Jin.

98/1995 *Coping with locational advantage: the economic development potential of tourism at Seisia community, Cape York Peninsula*, J.C. Altman.

99/1995 *Redfern works: the policy and community challenges of an urban CDEP scheme*, D.E. Smith.

100/1995 *The calculus of reciprocity: principles and implications of Aboriginal sharing*, R.G. Schwab.

101/1995 *Money, business and culture: issues for Aboriginal economic policy*, D.F. Martin.

102/1995 *Indigenous peoples and reshaping Australian institutions: two perspectives*, N. Pearson and W. Sanders.

103/1996 *Policy implications of rising Aboriginal fertility in the early 1990s*, H. Tesfaghiorghis.

104/1996 *Change in the relative occupational status of Indigenous workers, 1986-91*, J. Taylor and J. Liu.

105/1996 *Reforming financial aspects of the Native Title Act 1993: an economics perspective*, J.C. Altman.

106/1996 *Indigenous Australians and the socioeconomic status of urban neighbourhoods*, B. Hunter.

107/1996 *The comparative economic status of CDEP and non-CDEP community residents in the Northern Territory in 1991*, J.C. Altman and B. Hunter.

108/1996 *Indigenous participation in labour market and training programs*, J. Taylor and B. Hunter.

109/1996 *The economic status of Indigenous Australian households: a statistical and ethnographic analysis*, D.E. Smith and A.E. Daly.

110/1996 *Income poverty among Indigenous families with children: estimates from the 1991 Census*, R.T. Ross and A. Mikalauskas.

111/1996 *Having it 'both ways': the continuing complexities of community-controlled Indigenous education*, R.G. Schwab.

112/1996 *The geographic distribution of unemployment-related benefits and CDEP scheme employment*, J.C. Altman and B. Hunter.

113/1996 *The Aboriginal and Torres Strait Islander Commercial Development Corporation: a new approach to enterprise?*, W.S. Arthur.

114/1996 *CDEP as urban enterprise: the case of Yarnteen Aboriginal and Torres Strait Islanders Corporation, Newcastle*, D.E. Smith.

115/1996 *The determinants of Indigenous employment outcomes: the importance of education and training*, B. Hunter.

116/1996 *Linking accountability and self-determination in Aboriginal organisations*, D.F. Martin and J.D. Finlayson.

117/1996 *Aboriginal health and institutional reform within Australian federalism*, I. Anderson and W. Sanders.

118/1996 *Short-term Indigenous population mobility and service delivery*, J. Taylor.

119/1996 *Indigenous labour force status to the year 2000: estimated impacts of recent Budget cuts*, B. Hunter and J. Taylor.

120/1996 *Community involvement in education: an exploration of American Indian education policy and implications for Australia*, R.G. Schwab.

For information on earlier CAEPR Discussion Papers please contact Publication Sales, Centre for Aboriginal Economic Policy Research, Faculty of Arts, Australian National University, Canberra ACT 0200. Phone (06) 279 8211 Fax (06) 249 2789. Abstracts of all CAEPR Publications can be found at the following WWW address: http://coombs.anu.edu.au/WWWVLPages/AborigPages/CAEPR/caepr-home.html.