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**Estimating intercensal indigenous
employment change, 1991-96**

J. Taylor and M. Bell

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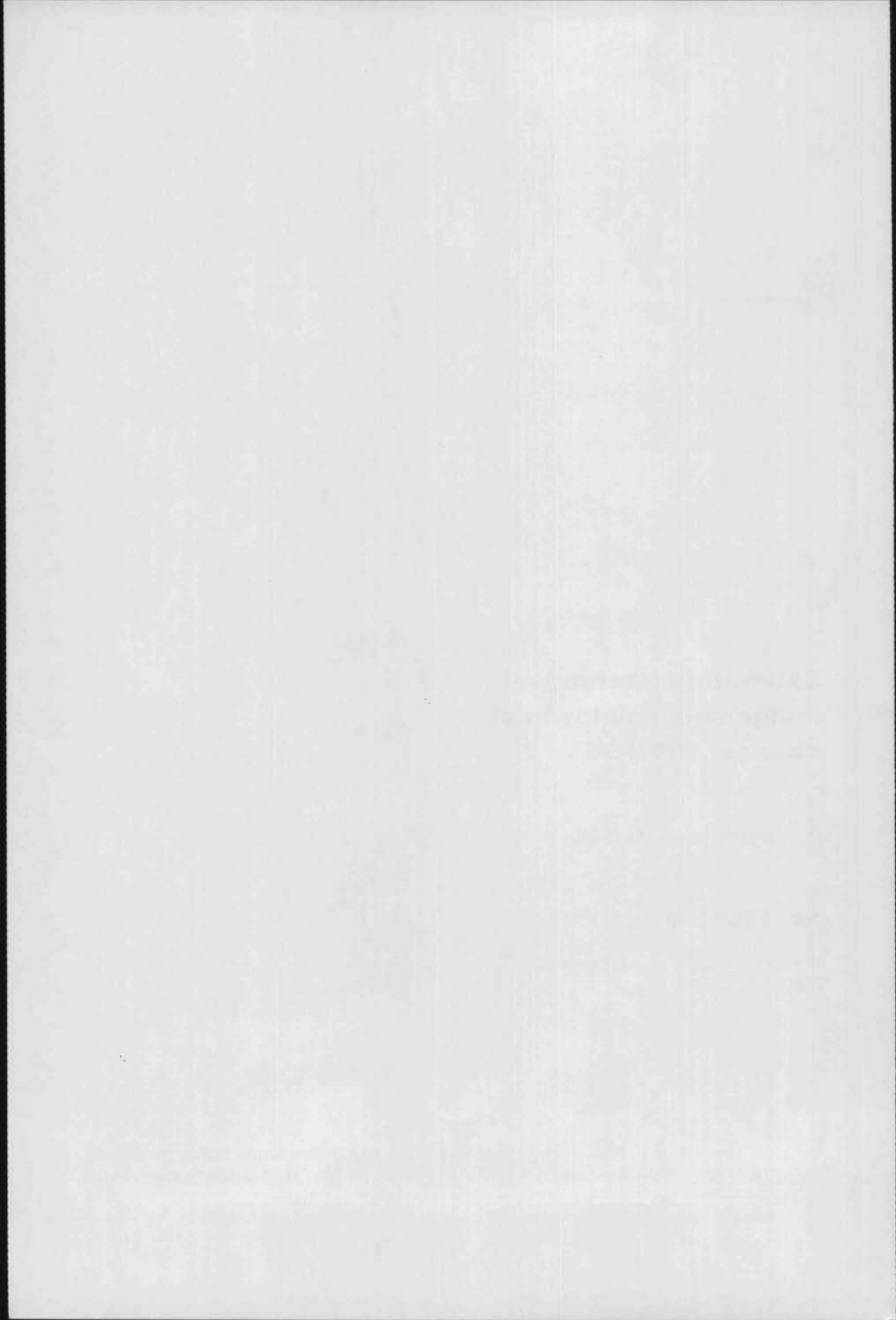
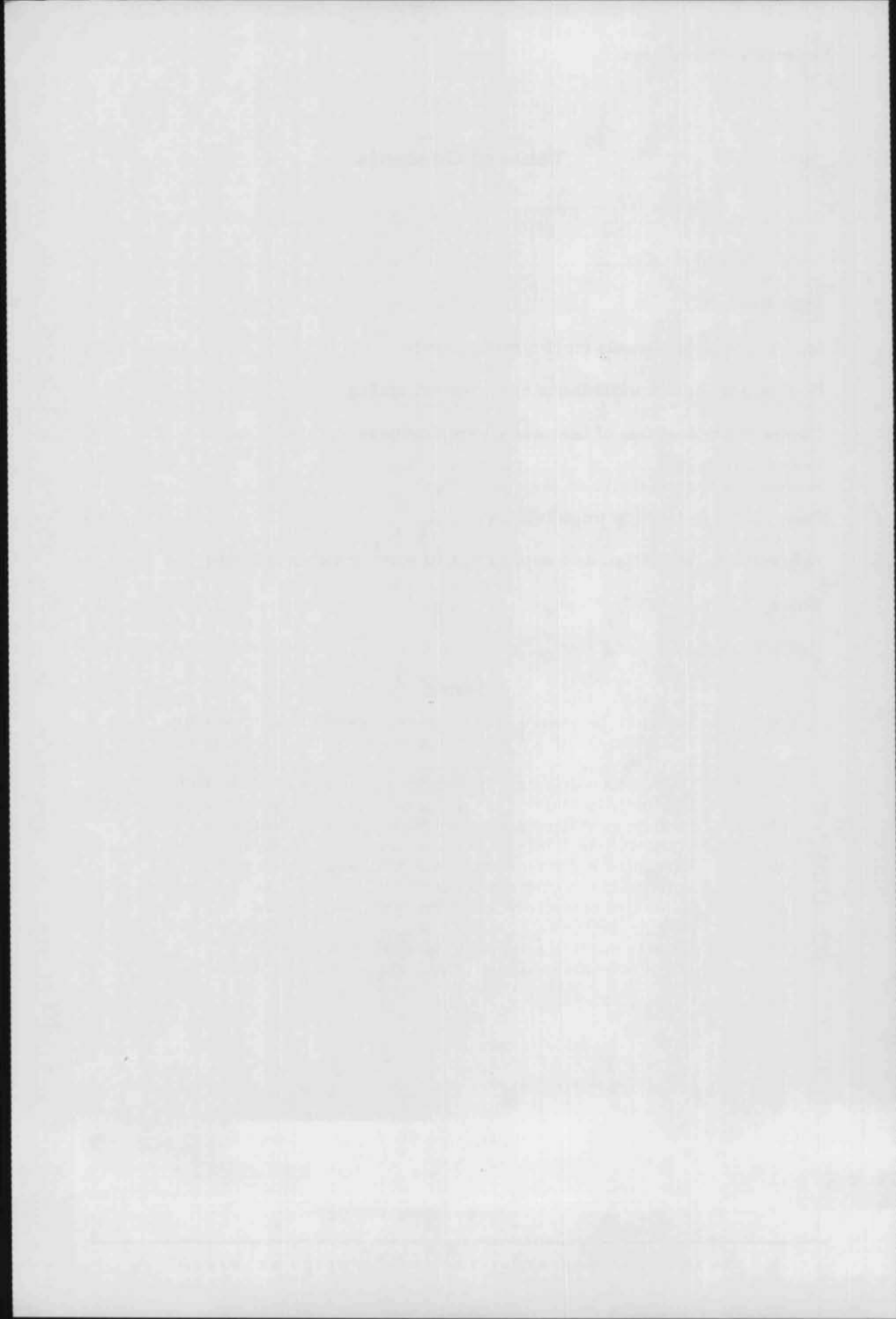


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Summary

The 1996 Census count of indigenous Australians included a substantial number of individuals who were not recorded as indigenous by the previous census. This paper considers the implications of this for interpreting change in employment numbers and provides a methodology for reconciling census data.

This task is urgent because policy makers rely heavily on census data to measure outcomes and establish trends. At face value, results from the 1996 Census present a good news story - an increase of 25,000 people in work, representing a 44 per cent growth since 1991. Such growth is scarcely credible in the context of previously observed indigenous employment trends as well as what is known about the performance of the labour market generally. How then is it to be interpreted?

Regional change in employment

One possibility is that employment growth was inflated by the addition of newcomers to the indigenous population who were more likely to be employed. If this is so, then it might be expected that regions with excess indigenous population growth also had above average growth in indigenous employment. When this proposition is tested no clear pattern emerges:

- Trends in some jurisdictions appear to support the hypothesis. In the Northern Territory, which experienced almost no excess population increase, employment growth was below the national average. On the other hand, New South Wales, Tasmania and the Australian Capital Territory, which had high excess population growth, also had above average employment growth.
- Contrary to the hypothesis, however, employment growth in Western Australia was well above average despite its relatively low excess population growth. Also, Victoria and South Australia, with higher population growth rates than Western Australia, recorded very low employment growth.

This variability suggests two things. First, that factors other than change in identification have contributed to employment growth. Second, that even in cases where population increase has been augmented by change in identification, the employment characteristics of 'newcomers' to the population have done little to alter the overall profile of labour force status.

Components analysis of intercensal employment change

A more direct approach to the interpretation of employment change is to estimate the contribution of key components. Two methods are presented. The first is based on an acceptance that all those recorded as indigenous in 1996 were present in 1991 but a proportion did not appear as such in the census. They

therefore have to be restored to the 1991 population in order to align 1991 employment with that observed in 1996. This adjustment is based on a reverse survival procedure with the effect of raising 1991 employment from 56,900 to an estimated 67,200.

A second adjustment is made using administrative data to account for the contribution of increased participation in the CDEP scheme and labour market programs to employment growth. This produces a residual net intercensal increase in mainstream employment of almost 3,000 positions representing a rate of increase of 1 per cent per annum. This was insufficient to keep up with growth in the working-age population resulting in a decline over the five-year period in the mainstream employment/population ratio from 27.9 to 26.3.

Policy implications

- The first half of the 1990s was one of continued over-reliance on the CDEP scheme and labour market programs for growth in officially identified employment.
- The gap between indigenous people potentially eligible for mainstream work and those actually in mainstream work continues to widen.
- Recommended changes to the CDEP scheme and the dismantling of many labour market programs increases the likelihood that indigenous people will appear in official statistics as unemployed, certainly against the backdrop of continued population growth.
- Whether alternative employment options are being created for indigenous people in the mainstream labour market is unknown, and will remain unknown, until the next census results are available in 2002.
- As far as the government's commitment to achieving 'real' improvements in labour force status is concerned, it is difficult to see by what means progress in this regard will be monitored as long as data on indigenous employment remain unavailable from conventional sources such as the Monthly Labour Force Survey.

Acknowledgments

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Introduction

Results from the 1996 Census have highlighted a key issue for the analysis of change in the economic circumstances of indigenous Australians. Put simply, how should intercensal change in employment (and any other social indicator) be properly interpreted when the population at the end of the intercensal period is substantially augmented by individuals who were not recorded by the census as indigenous at the beginning of the period. Ultimately, this is an accounting problem that is capable of resolution, but in the meantime there is a risk that different and misleading conclusions may be drawn from uninformed and superficial analysis. The aim of this paper is to head off such potential confusion by presenting a simple method for reconciling employment numbers in 1991 with those in 1996.

Some urgency is attached to this task as policy makers continue to rely heavily on census data as the primary source of information on the employment status of indigenous Australians. To date, the only other reliable source of information regarding indigenous labour force status derives from the now somewhat dated 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS). For the general population, on-going employment estimates are produced by the Monthly Labour Force Survey. While this survey includes an indigenous identifier, problems of sample size render the results for indigenous respondents too unreliable for publication (Barnes 1996).

By way of inference, then, employment change observed between 1991 and 1996 provides the most current means of assessing likely impacts of indigenous economic policy on labour market outcomes. It is worth noting that the use of census data in this way formed a partial basis for the mid-term review of the Aboriginal Employment Development Policy (AEDP) by establishing relative shifts in indigenous employment and income status between 1986 and 1991 (Taylor 1993a, 1993b). In addition, population and employment projections based on the 1986 and 1991 Censuses and the 1994 NATSIS assumed considerable policy significance in assessing developments during the early 1990s and estimating future job requirements. In this context, increasing disparity between indigenous employment growth and the projected growth in the working-age indigenous population was identified with escalating social and economic costs for indigenous people and for the Australian community as a whole (Taylor and Altman 1997).

An important point to note from this exercise is that a degree of confidence in projected estimates of need was drawn from a correspondence between the actual and the predicted 1991 Census count (Gray and Tesfaghiorghis 1993). In light of the much higher than expected count from the 1996 Census, revised estimates are now required and these await new ABS projections of the working-age population which are likely to be based on a wider range of assumptions regarding the components of growth (Gray 1997a; Taylor 1997). As for assessing likely future employment outcomes and associated employment need, some

adjustment is first required to the 1991 employment level in order to align it with the much higher level observed for the expanded population in 1996.

Interpreting indigenous employment growth

On the face of it, results from the 1996 Census regarding indigenous employment present a good news story—an increase of 25,000 people in work, representing a 44 per cent growth since 1991 (almost 9 per cent per annum). This growth occurred at a time when the overall number of Australians in employment increased by only 1.4 per cent per annum. Also of note is the reversal of a recent trend revealed by the 1994 NATSIS of a slowing down in indigenous employment growth from 6 per cent per annum, between 1986 and 1991, to just over 2 per cent per annum between 1991 and 1994 (Taylor and Altman 1997: 10–11). With a rate of employment growth at the level implied by this intercensal change, the policy goal of statistical equality in employment for indigenous people begins to look more achievable, contrary to earlier informed assessment (Sanders 1991).

However, a degree of caution has been expressed with regard to the use of unadjusted data on employment change between the 1991 and 1996 Censuses (Altman 1997a; Taylor 1997). This is because a large share of the increase in population numbers over this period was due to factors other than births and deaths. Most research on the nature of this phenomenon and its implications has been conducted in the United States with respect to changes in the American Indian population (Snipp 1986, 1997; Eschbach 1995; Sandefur, Rindfuss and Cohen 1996; Eschbach, Supple and Snipp 1998). It is noted, for example, that the amount needed to make intercensal change in numbers balance after accounting for births, deaths and migration is usually small, but in ethnic populations defined by self-identification, as in the case of American Indians, this 'error of closure' is often large due to shifts in the propensity of individuals to declare their ethnicity on census forms (Passel 1997).

This gap between observed intercensal population growth and the component of this growth attributable to demographic events has also been generally high for successive counts of indigenous Australians, at least since the 1971 Census when indigenous people were first able to self-report their origins in the national population count. The main exception to this was the 1986 to 1991 intercensal period when growth in the indigenous population was close to expectation based on natural increase. In 1996, the error of closure was again large with some 42 per cent of the intercensal increase in the indigenous population due to unexplained factors in excess of natural causes (Gray 1997b: 13).

What is not clear in such an event, is whether any change observed in population characteristics over time indicates an alteration in the circumstances of the original population or whether it merely reflects the particular features of individuals appearing in the population for the first time. It should be noted that this distinction can never be fully established as census unit record data are

confidential and, in any case, census forms are destroyed following processing thus preventing any tracking of individuals over time. At best, qualified estimates of the impact of changed identification can be made for a limited range of fixed population characteristics, such as age left school, using survivorship techniques and analyses of mean differences in population cohorts (Eschbach, Supple and Snipp 1998; Hunter 1998). For characteristics that are variable over time, however, such as employment status, estimating the contribution of newcomers to the population is more problematic.

There are two approaches, however, that provide some scope for assessing the probable impact of identification change on employment outcomes and for reconciling employment change data. The first of these is based on the fact that analytical difficulties arising from census error of closure are largely confined to the more populous southern and eastern States where recent indigenous population growth far exceeded expectations based on estimates of natural increase (Taylor 1997). In contrast with most other jurisdictions, population growth in the Northern Territory was very close to the projected level estimated on the basis of 1991 Census figures (Taylor 1997). As a consequence, this relative consistency in Northern Territory population levels over time provides a benchmark for the analysis of intercensal employment change against which the experience of other jurisdictions may be measured.

As to the second approach, the components of intercensal employment change are established by estimation. This involves a reverse survival procedure to augment the 1991 population with individuals whose indigenous status was only revealed in 1996. In this way, 1991 employment levels can be upwardly adjusted to produce a more realistic trend series over time. Also involved is an estimate of the contribution made by government program interventions. This has the added effect of isolating mainstream, as opposed to program-dependant, employment growth.

Regional trends in indigenous employment status

One way of assessing the impact of non-biological population increase on employment change is to ascertain whether any relationship exists between regions with excess population growth and those with above-average employment growth. The experience of the Northern Territory provides a useful benchmark against which to test this relationship given relative consistency in the Territory's indigenous population levels over time. In addition, because high rates of inter-marriage in major urban areas and southern and eastern regions are considered to be an important contributor to large errors of census closure, one might also expect newcomers to the 1996 Census-identified indigenous population in such locations to have economic characteristics closer to those of the general population. In short, certain regional populations, especially in the south and east, may display much improved employment status because of change in their composition.

Particular jurisdictions where one might expect employment outcomes to be relatively better than the control population in the Northern Territory are derived from Table 1. This shows that in New South Wales, Queensland, Tasmania and the Australian Capital Territory, population growth was substantially above expectation and it is here where employment growth maybe expected to be greatest. In the remaining States, of Western Australia, Victoria and South Australia, higher than expected population growth is also evident, but to a lesser degree, with less probable impact on employment change.

Table 1. Variation between 1996 indigenous population projections and 1996 estimated resident population (ERP) by State and Territory

	1996 population projection	1996 ERP	Per cent difference
New South Wales	83,707	106,294	27.0
Victoria	20,470	22,574	10.3
Queensland	84,089	100,504	19.5
South Australia	19,581	21,271	8.6
Western Australia	50,423	54,055	7.2
Tasmania	10,682	14,651	37.1
Northern Territory	48,830	49,566	1.5
Australian Capital Territory	2,052	2,952	43.8
Australia	320,046	372,052	16.2

Source: ABS (1996: 23).

As noted earlier, the number of indigenous people employed nationally increased by 44 per cent between 1991 and 1996. It is interesting to observe, then, that employment growth in the Northern Territory, at 38 per cent, was below this national average, while New South Wales, Tasmania and the Australian Capital Territory recorded above average growth and in Queensland it was close to the average (Table 2). This might suggest some impact of changed identification on regional employment outcomes although, contrary to this hypothesis, employment growth in Western Australia was also well above average while Victoria and South Australia recorded much lower employment growth than the Northern Territory.

Far less variation between the States and Territories is displayed when employment numbers are expressed as a ratio of working-age population (Table 3). Taking the Northern Territory first, a substantial improvement in the employment/population ratio from 31.5 to 36.2 was evident between 1991 and 1996. Only in Western Australia was this improvement exceeded. In all other States employment rates remained relatively unaltered, while in the Australian Capital Territory they actually fell.

Table 2. Change in indigenous employment numbers by State and Territory, 1991-96^a

	1991	1996	Net change	Per cent change
New South Wales	14,825	22,440	7,615	51.4
Victoria	4,369	5,712	1,343	30.7
Queensland	16,312	23,202	6,890	42.2
South Australia	3,821	4,452	631	16.5
Western Australia	7,355	11,600	4,305	58.5
Tasmania	2,417	3,954	1,537	63.6
Northern Territory	6,877	9,492	2,615	38.0
Australian Capital Territory	614	924	310	50.5
Australia	56,590	81,896	25,306	44.7

a. 15-64 year old population only.

Table 3. Change in indigenous employment status by State and Territory, 1991-96

	Employment / population ratio ^a		Indigenous / non-indigenous ratio	
	1991	1996	1991	1996
New South Wales	38.0	40.9	0.59	0.62
Victoria	46.2	48.0	0.72	0.73
Queensland	42.2	44.6	0.66	0.67
South Australia	41.3	42.5	0.64	0.66
Western Australia	32.9	42.2	0.51	0.62
Tasmania	49.0	50.2	0.80	0.81
Northern Territory	31.5	36.2	0.44	0.48
Australian Capital Territory	57.8	55.0	0.80	0.76
Australia	38.5	42.5	0.60	0.64

a. As a per cent of the 15-64 year old population only.

While the employment/population ratio overall displayed a noticeable improvement, the contribution to this from jurisdictions with relatively low census error of closure (notably the Northern Territory and Western Australia) was at least as significant as from those States with large unexplained population increase where little change in employment ratios was observed. In short, this suggests two things. First, that factors other than change in identification have contributed to employment growth. Second, that even where population increase has been augmented by change in identification, the employment characteristics of 'newcomers' to the population have done little to alter the overall profile of labour force status. This concurs with other findings from comparative analysis of 1991 and 1996 Census data which suggest that the social and economic characteristics of the 'new' indigenous population are broadly similar to those of the 'old' population (Gray 1997b, Taylor 1997b, Hunter 1998).

Components analysis of intercensal employment change

Direct adjustment of intercensal employment change can be achieved by estimating the components of change. This is done, first, by using reverse survival techniques to adjust the employment level in 1991. Second, by using administrative data on employment program participation to isolate mainstream employment growth.

Reverse survival

Inconsistency in census counts is almost a defining feature of the indigenous population. Despite erratic variation over time, the general trend in overall numbers since 1971 has nonetheless been upwards. Reasons for this have been the subject of much speculation but it is generally agreed that population growth in excess of biological increase primarily reflects an increased willingness of individuals to reveal their ethnic identity in official collections combined with greater efforts made by the ABS to achieve better enumeration.

This being so, the 1996 Census-derived population may be viewed as the best estimate yet of an ultimately unknown number of individuals of any Aboriginal or Torres Strait Islander ancestry. The point here is that those revealed in 1996 were no doubt present in 1991 but for whatever reason did not appear in the census enumeration as indigenous. Realistically, for meaningful analysis of intercensal change in employment, these individuals should be restored to the 1991 population. While the Census provides no information which can be used to achieve this directly, it is possible to derive an estimate of the 1991 workforce based on the 1996 enumeration. The standard demographic technique for reconstituting the initial population in this way is through reverse survival (Shyrock, Siegel and Associates 1976: 262-3, 418-21).

Application of the reverse survival procedure in this context involves taking the population as counted in 1996, disaggregated by age and sex, 'younging' this population by five years and, making allowance for deaths that occurred over the intercensal period, to estimate the population in each age-sex group in 1991. Thus, the population of males aged 20-24 in 1991 is estimated by applying reverse survival ratios to the male population aged 25-29 in 1996. This is essentially the reverse of the standard procedure used in making projections of future population by the cohort-component method.

The key to producing reliable estimates by this technique is selection of the correct ratios from an appropriate life table, that is, from a life table which accurately summarises the mortality experience of the relevant population over the period being considered.¹ Fortunately, a life table describing indigenous mortality over the 1991-96 interval is readily available (Gray 1997a). The procedures used to derive the 1996-91 survival ratios, and to apply these to the 1996 indigenous counts, are set out in Appendix A.

As indicated in Table 4, this procedure raises the working-age population in 1991 from the 159,712 revealed in the census count to an estimate of 188,586. Because this inevitably alters the age distribution, age-specific employment rates from the 1991 Census are then applied to the new estimated 5 year age distribution of the working-age group to generate an upward adjustment to the census-derived employment figure. Thus, as shown in Table 4, employment in 1991 rises from 56,895 to 67,186, an increase of 10,291. One way of interpreting this increase is to say that intercensal growth in the working-age population was responsible for around 40 per cent of the 25,000 increase in numbers employed.

Using this adjusted estimate of 1991 employment as the new base, the intercensal rise in the number of indigenous people now becomes 15,158 representing a rise of 22.6 per cent. While this is a substantially lower growth rate than the 44 per cent increase obtained from a direct comparison of 1991 and 1996 Census employment figures, it is nonetheless considerably above expectation based on previous trends (Taylor and Altman 1997: 10-11). However, much of this additional growth can be accounted for by program intervention leaving very little attributable to macroeconomic factors.

Table 4. Estimated indigenous employment change based on reverse survival of working-age population, 1991-96

	1991		1996
	Census count	Estimate from reverse survival	Census count
Population aged 15+	159,712	188,586	211,568
Employed	56,895	67,186	82,344

Program intervention and employment growth

There is one other factor that needs consideration when accounting for change in employment, particularly among indigenous Australians. This is the fact that the numbers recorded as employed are affected by purely administrative shifts to employment status of individuals who would otherwise be regarded as unemployed or not in the labour force. Such program intervention comes primarily in the form of participation in the Community Development Employment Projects (CDEP) scheme but also via Department of Employment Education Training and Youth Affairs (DEETYA) labour market programs that were in operation at the time of the 1991 and 1996 Censuses.²

According to the Australian Bureau of Statistics (ABS 1995:8), the labour force status of labour market program participants is recorded by the census using the standard question about activities in the week prior to enumeration. Those in programs involving a form of wage subsidy or job placement are likely to regard themselves as having undertaken paid work, and hence employed. Those in training, but with no subsidy, are more problematic. However, if these people

held a part-time job along with their training then they were also likely to be regarded as employed. According to the Indigenous Employment Initiatives Branch of DEETYA, labour market programs that were likely to have contributed to employment in this way in 1996 included various elements of the Training for Aborigines Program (TAP), Apprenticeship Wage Subsidies, Job Clubs, National Training Wage Traineeships, the New Work Opportunities Program, Jobskills Projects, and the various Jobtrain and Jobstart programs.

A question remains as to which of these programs actually generate additional employment for indigenous people. For example, some individuals in wage subsidised employment may have secured their position regardless. However, it is more likely that wage subsidies offer an important competitive edge for indigenous people in the labour market given their multiple disadvantage in securing employment (ABS/CAEPR 1996). Equally, it seems that indigenous DEETYA clients in wage subsidy programs would be more likely to substitute for non-indigenous employees given their small share of the population and that this would add to employment outcomes.

One pointer to this positive interpretation of the possible impact of program intervention is provided by the fact that nationally the indigenous employment/population ratio was relatively stable between 1991 and 1994 at around 35 per cent (Australian Bureau of Statistics (ABS) 1995: 41), but in the space of two years to 1996 it increased to 39 per cent. Accordingly, over the same two year period the unemployment rate fell dramatically from 30.8 to 22.7. Such a positive shift in labour force status is unlikely to have been produced by market forces alone, especially at a time of poor outcomes generally in the labour market. Given the coincidence in timing, the suggestion here is that this improvement was associated with the introduction of *Working Nation* programs.³

The fact that indigenous people rely heavily on government program support for employment creation is well documented (Sanders 1993; Taylor and Hunter 1996; Altman 1997b; Taylor and Altman 1997). This is especially so in regard to 'make work' interventions such as the CDEP scheme and various labour market programs involving wage subsidies or on-the-job training. Any meaningful assessment of intercensal employment change thus has to account for changes in such programs that may influence the number of individuals who can claim on the census form that they had a full-time or part-time job of any kind in the week prior to enumeration. The key variations in this regard over the 1991-96 intercensal period were a substantial expansion in the number of CDEP schemes and associated participants (Sanders 1993; Altman 1997b) and a steady rise in labour market program placements, particularly following the introduction of the Labor government's *Working Nation* initiatives in 1994 (Taylor and Hunter 1996). The contribution of these to employment growth is estimated using administrative data.

As far as employment via the CDEP scheme is concerned, this can't be fully established from census data. However, it was known from the 1993 Review of the scheme that not all participants were working and an estimate of 60:40 working

to non-working participants was derived from case studies (Deloitte Touche Tohmatsu 1993: 51). With 18,473 scheme participants at the time of the 1991 Census this produces an estimate of 11,083 employed (Table 5). Greater precision in estimation is possible for 1996 as the Special Indigenous Form (SIF) used to enumerate the indigenous population resident in remote areas (approximately 30 per cent of the total), included a prompt to elicit CDEP scheme employment. From this source, a total of 12,256 individuals were recorded as employed by the scheme.⁴

Interestingly, as in the 1991 estimate, this figure was very close to 60 per cent of known scheme participants at the time of the Census in areas covered by the SIFs. Away from remote areas, it is ATSIC's estimation that a higher proportion of scheme participants (say 80 per cent) were working in 1996. With some 8,000 scheme participants in non-remote areas, this produces an estimated 6,400 working participants. Together with those identified on census forms a total of 18,656 CDEP scheme employees is thus derived for 1996 (Table 5).

Table 5. Estimates of mainstream indigenous employment change, 1991-96

	1991	1996
Total employed	67,186 ^a	82,344
Employed in CDEP	11,083 ^b	18,656 ^c
Non-CDEP employed	56,103	63,688
Employed in labour market programs	3,397 ^d	8,043 ^e
Employed in mainstream	52,706	55,506
Mainstream employment/population ratio	27.9	26.3
Net change in mainstream employment	2,939 (1.1 per cent per annum)	

a. Adjusted by reverse survival.

b. Based on a ratio of 60:40 working to non-working participants.

c. Based on CDEP employment recorded by the Special Indigenous Form in remote areas and a ratio of 80:20 working to non-working participants in all other areas.

d. Includes placements in DEET programs A20, A30, A31, A42, H15, U13, W11, W12, W13, W15, W16, W20, W33.⁵

e. Includes placements in DEETYA programs A20, A30, A31, F12, F13, G20, H15, H42, H43, N20, N21, N42, N43, O11, S11, U13, W40, W41, W42, W43.⁵ Excludes 139 CDEP participants in employment placements and brokered programs.

By subtracting these 1991 and 1996 estimates of CDEP scheme employment from total employment in each year, the amount of increase in employment between 1991 and 1996 is reduced from 15,158 to 7,585 (63,688 minus 56,103). Further reduction in this increase is achieved by accounting for those employed via placement in a labour market program. The number of indigenous placements in programs that were likely to have produced an employment outcome at the time of the census are available from the DEETYA program database. At the time of the 1991 Census, a total of 2,686 indigenous people were in such programs and by 1996 this number had risen to 8,182.

Subtracting these figures from the non-CDEP employed produces a final residual estimate of 'mainstream' employment. As shown in Table 5, this reveals an estimated net intercensal increase in mainstream employment of almost 3,000 positions representing a rate of increase of 1.1 per cent per annum, which is somewhat higher than the rate of 0.6 per annum estimated for the period 1991–1994 from the NATSIS even though this latter estimate did not account for employment via labour market programs (Taylor and Altman 1997: 11). The key point to note, however, with a view to contemplating future job requirements, is that the estimated growth rate in mainstream employment was insufficient to keep up with growth in the working-age population resulting in a decline over the five-year period in the mainstream employment/population ratio from 27.9 to 26.3.

Of course, this estimation relies heavily upon assumptions about how individuals in various labour market programs respond to the census question on paid employment in the week prior to enumeration. While ultimately this is unknown, the substantial rise in the indigenous employment rate and even greater drop in the unemployment rate between the 1994 NATSIS and the 1996 Census does provide some corroborative evidence for more than just market forces at work. In any event, even if none of the placements in designated programs in 1991 or 1996 were recorded by the census as employed, the mainstream employment/population ratio would only be marginally higher in both years and, more importantly, would not have changed over the intercensal period.

Conclusion and policy implications

The substantial contribution of non-biological factors to indigenous population growth observed for the 1991–96 intercensal period means that data on change in employment numbers cannot be accepted at face value. As observed for other socially constructed populations, excess population growth can cause confusion among analysts when comparing results over time. With regard to the American Indian population, for example, Sandefur, Rindfuss and Cohen (1996: 3) have noted two analytical responses: one, from the substantively oriented, who in observing change speculate about the causes of that change; another, from the methodologically oriented, who strive to demonstrate no change and invoke data error. As a consequence, one of the main policy challenges in the United States has been sorting through the changing numbers to identify needs and shifts in those needs over time. This paper clearly follows the methodological orientation in reaching a number of conclusions.

The first of these is that the employment status of newcomers to the population can not be established. While, ultimately, their net effect has been minimal in terms of altering relative indigenous employment status, the fact remains that the employment status of the original 1991 population could be far

worse (or better) being hidden by the much better (or worse) employment characteristics of newcomers.

Second, and notwithstanding the first conclusion above, there appears to have been little compositional change in employment status despite excess population growth. This is suggested by the fact that States with the greatest excess population display the least improvement in employment status. Other evidence in support of this is drawn from analysis of compositional change in cohorts as well as a lack of spatial change in major urban areas with indigenous people still over-represented in neighbourhoods with low socioeconomic status (Taylor 1997; Hunter 1998).

A third conclusion is that, at the very least, adjustment should be made to the 1991 employment level to align it with that observed in 1996 before comparison between the two can be drawn. The most advisable means of achieving this is by reverse survival of the 1996 population to reconstruct the 1991 population of working age. Having done this, it is then also important to account for an expansion of employment via program intervention. The reliance of indigenous people on employment via special programs and the vulnerability to shifts in government policy that this entails has long been an issue (Altman and Daly 1992). In this context, the ultimate test of change in employment status is the rate at which mainstream employment growth is occurring. The analysis suggests that this has fallen behind the growth in working-age population.

In policy terms, this last conclusion is crucial. In effect, the first half of the 1990s was one of continued over-reliance on program intervention for employment growth, most notably via the CDEP scheme but increasingly also through participation in labour market programs. As a consequence, the essential finding of 1991 Census-based employment projections (Taylor and Altman 1997) remains—that, on current trends, the gap between indigenous people potentially eligible for work and those actually in work will progressively widen.

While revision of the current 1991-based estimates of future job requirements awaits the release of official population projections from ABS, the prognosis is almost certainly for higher estimates given the expanded working-age population. In the meantime, it is pertinent to consider the likely effect of the recommended capping of CDEP scheme participant numbers at 32,000 for the financial years 1998/99 and 99/2000 (Commonwealth of Australia 1997: 12). As Altman (1997b: 10–11) points out, and as the preceding analysis suggests, the unavoidable backdrop to this is continued population growth and unmet demand from labour.

Also of significance are the substantial changes that have occurred in the employment and training portfolio since the time of the 1996 Census with far less emphasis on wage subsidy labour market programs and with the privatisation of employment placement. As things stand, in the absence of published indigenous data from the Monthly Labour Force Survey and with the decision not to proceed with another National Aboriginal and Torres Strait Islander Survey, the impact of policy decisions on indigenous employment outcomes will be unknown until the

2001 Census reports late in 2002. In terms of government commitment to achieving real outcomes in employment it is difficult to see how by what means progress in this regard will be monitored (Altman 1997a). What does seem certain, however, is that policy changes that have occurred over the past two years place greater emphasis on the need for outcomes in mainstream labour markets.

Appendix A: Derivation and application of reverse survival ratios

For any given five-year age group x at time t , the probability of survival (S_x) to be five years older five years later is given by $5P_{x+5, t+5} = 5P_{x,t} * 5S_x$. It follows that for any given age group, the population aged five years younger five years earlier is given by $5P_{x,t} = 5P_{x+5, t+5} * 1/5S_x$.

The relevant s_x rates are computed from the L_x and T_x columns of the life table. For any five-year age group, $5S_x = 5L_{x+5} / 5L_x$. The oldest age group is inevitably open-ended (eg, aged 70 and over). For this group, who will be aged 75 and over five years later, the S_x rates are based on the T_x column of the life table as follows: T_{x+5} / T_x .

Table A1 illustrates reconstitution of the 1991 population aged 15 and over for indigenous males using the above procedure. Parallel computations were made for females. It is apparent that the population aged 15–19 in 1996 were aged 10–14 in 1991 and were, by definition, therefore ineligible to be members of the labour force. The change in numbers aged 15 and over between 1996 and 1991 (as reconstituted), therefore comprises two components: the inclusion of people who died during the intercensal period, partly offset by the exclusion of those who would have been aged 10–14 at the beginning of the interval.

Table A1. Reverse survival analysis to estimate numbers of indigenous males alive in 1991 aged 10 years and over

Age in 1996	Males in 1996	Reverse S_x rates	Age in 1991	Expected males in 1991
15 to 19	17,482	1.0104124	10 to 14	17,664
20 to 24	16,070	1.0159829	15 to 19	16,327
25 to 29	14,494	1.0271644	20 to 24	14,888
30 to 34	12,524	1.0358205	25 to 29	12,973
35 to 39	10,724	1.0501402	30 to 34	11,262
40 to 44	8,635	1.0701825	35 to 39	9,241
45 to 49	6,814	1.0842788	40 to 44	7,388
50 to 54	4,888	1.1079442	45 to 49	5,416
55 to 59	3,404	1.1639963	50 to 54	3,962
60 to 64	2,578	1.2416855	55 to 59	3,201
65 to 69	1,739	1.3277809	60 to 64	2,309
70 to 74	1,034	1.4415531	65 to 69	1,491
75 plus	1,234	1.8599379	70 plus	2,295
Total	101,620		Total 15 plus	90,752

Notes

1. Application of the reverse survival procedure to reconstitute the earlier population also assumes that the population under study is closed to immigration. While some overseas movement of indigenous people certainly did occur over the 1991–1996 interval, net international migration was very small and is unlikely to have any significant effect on the estimates.
2. Prior to 1996, DEETYA was known as the Department of Employment, Education and Training (DEET).
3. The *Working Nation* initiatives launched by the Labor government in May 1994 introduced the Job Compact which gave people in receipt of unemployment allowances for more than 18 months the guarantee of a job or training opportunity. Early interventions, case management and the National Training Wage were also major features of *Working Nation* programs.
4. This figure actually includes a small number of census respondents from areas where the SIF was not applied. These were CDEP scheme employees in non-remote areas who nominated the scheme as the name of their employer thus attracting a coding for CDEP in the industry sector classification.
5. A20—Major Employment Strategies; A30—Job Skills Development (TAP Private Sector); A31—Work Experience/WIP; A42—Enterprise Employment Assistance; F12 and F13—New Enterprise Incentive Scheme Formal Training; G20—Group Employment Program; H15—Disabled Apprenticeships; H42 and H43—Apprenticeship Wage Subsidy; N20, N21, N42, N43—National Training Wage Program; O11—New Work Opportunities Program; S11—Job Skills Umbrella Projects; U13—SAP; W11, W12, W13, W15, W16, W20, W33, W40, W41, W42, W43—Jobstart.

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