Do Age and Experience Always Go Together? The Example of Indigenous Employment*

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Abstract

Labour market experience is central to labour economics, however, it can be difficult to measure in cross-sectional surveys for groups who voluntarily or involuntarily spend prolonged periods outside the labour force (e.g. incarceration). This paper uses census data on the age profiles of employment since 1981 to estimate the experience that Indigenous and non-Indigenous populations could be expected to have conditional on their age. This estimate is then compared with survey information on experience to generate an estimate of inconsistency between measured and expected experience. The differential is very small for the non-Indigenous population, but survey estimates for Indigenous people are substantially higher than the relevant population-based estimates. It is possible that this finding reflects the fact that the composition of the Indigenous population has changed over time, differences in recall bias or even selective mortality with persons with a more substantial employment history surviving longer.

Keywords: Measuring employment experience, Indigenous Australians, remote labour market, labour market programs

JEL Classification: J15, J21, J78

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1. Introduction

Almost all curricula vitae document how an individual’s experience in the workplace may be relevant for potential employers. Experience in the workplace can make workers more productive or give jobseekers an advantage in looking for work as it reveals to employers that the worker can operate in a workplace environment. The economic theory of labour market outcomes underlies our expectation that people with more relevant workforce experience are both more likely to have a job and receive higher wages in recognition of their higher experience (Mincer 1958, 1974; Ben-Porath, 1967; McConnell and Brue, 1992).

Intuitively labour market experience accumulates unless workers forget what they have learned or cannot recall the experience in question. Alternatively, if the modes of production change sufficiently, then some experience may become less useful for employers. In a rapidly changing world, any social and economic experience can become less relevant or even redundant. Notwithstanding, it is reasonable to expect that experience increases with age. All else being equal, older people usually have had more opportunity to get workforce experience and this is likely to drive better employment and wage outcomes into the future.

Experience in employment is important because it determines future economic outcomes. Some groups have been historically excluded from the labour market and hence future economic prospects are severely circumscribed. Indigenous people have been systematically excluded from the labour market for the vast majority of the post-colonial settlement of Australia (Hunter, 2005). In order to understand current Indigenous labour disadvantage, we need to understand how historical exclusion from employment may limit experience and hence affect employment prospects into the future.

This paper examines the extent to which work experience increases with age for various groups. Indigenous and non-Indigenous males and females have different prospects and hence one would expect experience to accumulate at different rates. A second research question is whether the measured level of experience is consistent with the employment opportunities that the various groups have had. Stated another way, is the reported level of experience more inconsistent (with respect to population employment prospects) for one group than another? Even if the measured level of experience is consistent with population employment prospects, we need to ask whether there is any difference in empirical analysis arising from the use of either the age or experience variables in the specification. These questions are crucial to the diagnosis about how to best address Indigenous disadvantage.

The next section provides an introduction to the data used in the analysis. The following section uses the historical age profiles in census employment (by Indigenous status and gender) to provide population-based estimates of the average experience. The survey data reports the experience in paid employment which can be compared to calculations of the average experience we would expect given employment rates for the respective population groups. The concluding section reflects on the accuracy of measured workforce experience and the usefulness of such data in analysing Indigenous disadvantage. The analysis points to notable shortfalls in employment experience for certain groups which has important implications for constructing effective policy.
2. Data

There are three main data sources used in this paper. Census data are used to identify the age profiles of employment for both Indigenous and non-Indigenous populations. The earliest reliable Indigenous data on employment by age were collected in 1981, and hence the historical series for employment of Indigenous and non-Indigenous people in various age groups is limited by available census statistics (Altman, Biddle and Hunter, 2005). This paper uses detailed census cross tabulations by gender for five-year age groups of Indigenous and non-Indigenous Australians. The census data on employment age profiles before 2006 are documented in Hunter (2004) and Gray and Hunter (2002), while information from the last two censuses was derived from the ABS Table Builder application. All the data are available from the authors on request.

These age profiles have been used to estimate how many years we expect Indigenous and other Australians to have been employed, on average, given the respective employment profiles for each census. In this paper, the term employment rate is referring to the employment-to-population ratios and not the proportion of the labour force who are employed.

The Indigenous employment profile is quite distinctive from the non-Indigenous employment profile because of certain life-course events. Indigenous employment rates are lower than the non-Indigenous rates for all age groups, but the timing of fertility decisions and interactions with the criminal justice system can disproportionately affect Indigenous males and females for some age groups (Biddle and Yap; Hunter and Daly, 2013; Stephens, 2010).

Census information on average employment outcomes is important because it allows us to provide a population benchmark for workforce experience reported by respondents to two surveys: The 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS), which is the most recent cross-sectional data set focussing on the Indigenous population; and the 2008 wave of the Household, Income and Labour Dynamics Australia (HILDA) which allows us to analyse non-Indigenous Australians surveyed in the same year as NATSISS.

NATSISS 2008 is a multi-faceted social survey of Indigenous Australians, covering 13,307 persons in all States and Territories. A random selection of a number of Indigenous communities and outstations was made, and within these selected communities and outstations a random sample of dwellings was selected. Only Indigenous persons who were usual residents of private dwellings were included in the survey.¹ In non-community areas, dwellings were selected using a stratified multi-stage sample based on information at the mesh block level within Census Collection Districts. Within each household, a random sub-sample of usual residents of one or two adults (aged 15 years or over) and one or two children (aged 0-14 years) were selected for inclusion in the survey. Detailed information was collected for these selected persons, while only a very limited number of demographic characteristics are collected on the other members in the households.

¹ Some Collection Districts and Indigenous communities in remote and very remote areas with few Indigenous households were excluded from the sampling frame. As a result, NATSISS 2008 has a higher level of under-coverage compared to other ABS surveys. For more detailed information on NATSISS see ABS (2010).
HILDA is a longitudinal survey of Australian households which has been run annually since its implementation in 2001, covering approximately 13,000 individual respondents from more than 7,000 households living in private dwellings in non-remote areas. The survey collects information on a large number of individual and household characteristics, with standard demographic and labour market information collected in all waves.\(^2\) This study uses wave 8, since its timing matches that of NATSISS 2008.\(^3\) Unlike NATSISS 2008, which only collected information from selected members of sampled households, HILDA interviews all individuals in sampled households.

These two surveys collect similar information about experience using different questions in rather different contexts within the respective questionnaires. Respondents to the 2008 NATSISS are asked: ‘Thinking about your whole life, how much time have you been in any paid employment? The answer is given in years (grouped in a number of possible responses). First time respondents to HILDA are asked ‘How long has it been since you left full-time education for the first time? The respondents are then asked: ‘Now of these [years / months], how many [years / months] in total have you spent … ‘In paid work?’; ‘Unemployed and looking for work?’; and finally, ‘Other (neither working nor looking for work)?’

As HILDA is a longitudinal survey, Melbourne Institute staff also use the information from the labour force calendar collected for each wave to update the work experience variable for later years. If the person studies part time and works part time, they get one year added to the work experience. If the person studies full time for half a year, then works full time for half a year, they get 0.5 year added to the work experience. These assumptions are both reasonable and unlikely to differ substantially from the implicit judgements made by NATSISS respondents in estimating the time in paid employment. While there are clear differences in the way the information on experience was collected, both variables are attempting to measure the same concept, the time ever spent in the workforce. Perhaps the most substantive difference between the two measures of experience is the starting point from which experience is measured. NATSISS asks about experience over a respondent’s whole life, whereas HILDA is only interested in experience since they left full-time education for the first time. Therefore, we expect the NATSISS measure to marginally overstate the level of experience relative to experience measured using the HILDA instrument, as people may have gained some experience in employment while studying. Given that the information on experience is not precisely comparable in the respective surveys there may be important implications for the interpretation of evidence and the conclusions drawn from that evidence.

\(^2\) Although the Indigenous population is represented in HILDA, they are not oversampled in wave 8, making the number of observations for this group too small for separate analyses. Detailed information is available on the website http://melbourneinstitute.com/hilda/; and Wooden and Watson (2007) discuss the HILDA Survey design.

\(^3\) NATSISS 2008 was conducted from August 2008 to April 2009, while HILDA wave 8 was conducted from August to December 2008.
3. Population estimates of average experience

Census employment rates for each five-year age cohort can be used to calculate expected experience for Indigenous and other Australians by combining information about date of birth and the year in which the census was collected. That is, using the employment rates for each age group in a population we can calculate the expectation of being employed at any given age by adding up the probability of any sub-population being in employment in any particular census year (table 1). The use of the average employment rates to create this population benchmark for experience is arguably a rather strong assumption. Unfortunately, the lack of reliable information on Indigenous labour market dynamics means that it is not possible to relax this assumption at this stage. Recent HILDA data provides some justification for our working assumption.4

Table 1 - Population Estimates of Average Experience by Age Group, Indigenous Status and Gender

<table>
<thead>
<tr>
<th>Age in 2011</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indigenous</td>
<td>Non-Indigenous</td>
<td>Indigenous</td>
<td>Non-Indigenous</td>
</tr>
<tr>
<td>15-24</td>
<td>2.7</td>
<td>3.9</td>
<td>2.4</td>
<td>4.0</td>
</tr>
<tr>
<td>25-34</td>
<td>8.0</td>
<td>12.0</td>
<td>6.2</td>
<td>9.5</td>
</tr>
<tr>
<td>35-44</td>
<td>13.1</td>
<td>20.4</td>
<td>10.1</td>
<td>17.1</td>
</tr>
<tr>
<td>45-54</td>
<td>19.1</td>
<td>29.7</td>
<td>14.1</td>
<td>23.8</td>
</tr>
<tr>
<td>55-64</td>
<td>24.2</td>
<td>37.7</td>
<td>16.0</td>
<td>28.2</td>
</tr>
<tr>
<td></td>
<td>Average total employment experience derived from historical census data, 1981-2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td>3.9</td>
<td>2.4</td>
<td>4.0</td>
</tr>
<tr>
<td>25-34</td>
<td>8.1</td>
<td>12.2</td>
<td>6.6</td>
<td>11.2</td>
</tr>
<tr>
<td>35-44</td>
<td>13.9</td>
<td>21.0</td>
<td>11.5</td>
<td>18.3</td>
</tr>
<tr>
<td>45-54</td>
<td>19.7</td>
<td>29.6</td>
<td>16.9</td>
<td>25.9</td>
</tr>
<tr>
<td>55-64</td>
<td>24.7</td>
<td>37.0</td>
<td>21.1</td>
<td>32.0</td>
</tr>
<tr>
<td></td>
<td>Average total employment experience derived from 2011 census data</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on age profiles of census employment rates, 1981-2011.

The top half of table 1 reports the estimates of the expected experience in the population based on available historical census data between 1981 and 2011. However, for the bottom half of table 1 we assume that the historical labour market was the same as it was in 2011. Given that the Indigenous labour market has evolved over recent decades (Altman, Biddle and Hunter, 2005), the employment rates from the current

4 Data from Wave 11 of HILDA augmented the Indigenous subsample and this allows some tentative insight into the relevant issues in the respective populations. While tenure in the current job was much lower for the Indigenous population, especially for part-time workers, the difference in the number of weeks worked in the previous year between Indigenous and non-Indigenous workers was small (e.g., all full-time employed worked just under 40 weeks, irrespective of Indigenous status or gender). Therefore, even though the labour market dynamics of Indigenous and non-Indigenous Australians are likely to be quite different in terms of employment churning, the probability of employment in a given year is likely to translate into similar levels of experience for the respective populations.
labour market are arguably more relevant than historical information for estimating what future Indigenous cohorts may expect in future. In general the difference between the two sets of estimates is small, which indicates both these estimates are reasonably robust. The exception to this generalisation is that for older females the historically-based estimates of experience are as much as four to five years lower than those based on the most recent census data for the oldest female age group. This is not a coincidence given that this age group has lived through an era of dramatic increase in the participation of women in the workforce. If gains in female employment are maintained into the future we can expect an Indigenous girl turning 15 years old today to accumulate about five years more employment experience over her lifetime than an Indigenous woman who has reached the traditional age for retirement at 2011.

Note that average experience tends to increase with age in table 1 by construction as employment probabilities are assumed to accumulate over time. Indigenous people have lower employment probabilities at each age and by the time retirement age is reached, Indigenous people are likely to have worked 12 to 13 years less than non-Indigenous people based on historical data. Of course this has enormous policy implications in that Indigenous people are much less likely to be able to save out of wages over their lifetimes and will have less superannuation investments to support themselves in retirement. While this observation is important in its own right, the estimates in table 1 also provide a benchmark for the survey estimates based on the reported employment experiences of Indigenous and non-Indigenous respondents.

4. Survey estimates of experience

Given that HILDA only provides estimates of experience for non-remote areas, NATSISS estimates are separately computed for remote and non-remote areas. Of course where one wants to compare the measured experience for Indigenous and other Australians, the reader should focus on the results for non-remote areas. Figures 1 and 2 report the experience data for males and females by labour force status, Indigenous status and remoteness.

The unemployed are the group with the lowest level of experience for both Indigenous and non-Indigenous populations (figures 1 and 2). In contrast the employed tend to have relatively high levels of experience, especially people who are employed full-time.

Notwithstanding these generalisations, the stand-out feature of figure 1 is that the non-Indigenous males who are not in the labour force (NILF) actually have higher levels of experience than the non-Indigenous employed. This is probably associated with the fact that the NILF group is older on average and many may have retired before they reached 65 years. The role of age in driving the differences in experience in figures 1 and 2 is crucial and we shall return to it at the end of the following descriptive discussion.

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5 Theoretically, work experience could go up and down with age for the upper panel in table 1 although this is unlikely as it entails certain demographic groups experiencing large countercyclical employment effects. In the lower panel experience increases with age by construction.
Figure 1 - Experience by Indigenous Status and Labour Force Status, Males 2008

Note: The whiskers or error bars represent the 95 per cent confidence intervals. Sources: NATSISS 2008 (Indigenous), HILDA wave 8 (non-Indigenous).

For Indigenous males, the unemployed have significantly lower levels of experience than the NILF category as well as those in employment. It is particularly concerning that the level of experience of remote Indigenous NILF males is so low. While the remote population is likely to be disproportionately young, and hence relatively inexperienced in labour market terms, this differential is likely to reflect constraints on either the labour-demand or labour-supply side. To the extent that workforce experience is a good predictor of future employability this does not bode well for future prospects of reducing Indigenous labour market disadvantage. For example, it is possible that this observation reflects a labour supply constraint in that almost all those who are willing and able to work in remote areas have been included in the workforce already. If an Indigenous person is not already involved in employment they may not have sufficient experience to be productive for most employers. Even if there are employers located nearby, for example mining operations located near remote Indigenous communities, the skill sets of local residents may not necessarily match the job opportunities available.

Notwithstanding the above, to the extent that people may be able to move to areas to take up employment, the local employment opportunities could be higher. While this mobility argument may have some validity for non-Indigenous residents of remote areas, it is unlikely to have much explanatory power for the remote Indigenous residents who are likely to have always lived on or near their country or to have moved to an area for family reasons rather than work-based reasons (Taylor, 2009).

Given that remote Indigenous communities do not tend to be economically developed, some readers may be surprised that the measured level of experience is high for remote Indigenous part-time workers. One explanation for this is that the
Community Development Employment Projects (CDEP) scheme (which tends to offer part-time employment) is boosting the level of experience reported, as a substantial proportion of remote Indigenous communities historically have participated in the program since the 1980s. We explore this explanation further after analysing the reported experience of females by labour force status, remoteness and Indigenous status (figure 2). In contrast to figure 1, experience is uniformly higher for employed females compared to both NILF and unemployed females. The level of experience is particularly low in remote areas, which probably indicates that there are likely to be some labour demand or supply constraints for Indigenous females in these areas. If that is the case, then the local population needs to have additional training so that employers will want to employ residents, or other suitably skilled Indigenous workers may have to be brought to the jobs. To the extent that cultural factors limit, or are inconsistent with the desire to work in mainstream ‘non-Indigenous jobs’ (Jordan, 2011), the policy options may be largely constrained to the migration or ‘fly-in-fly-out’ options that bring in workers whose characteristics better match the demands of the job.

Figure 2 - Experience by Indigenous Status and Labour Force Status, Females 2008

While there is systematic information in experience by current labour force status, most of the differentials in experience are explained by the differential in average age for the respective groups (appendix table A1). Hence the rest of this paper focuses on the relationship between experience and age, but will also reflect briefly on the nature of employment experiences in the CDEP scheme.

As alluded to above, one obvious explanation for experience being higher than expected in remote areas is that the CDEP scheme jobs are treated as employment for the purposes of Australian Bureau of Statistics’ (ABS) and many official statistics, and hence CDEP participants are highly likely to report that they are employed and have
been employed for several years.\textsuperscript{6} There is some debate in policy circles as to whether CDEP scheme work is like mainstream work (Gray, Howlett and Hunter, 2013). If participation in and access to the scheme in the local area was reasonably stable over time, then experience is likely to be especially high for part-time employed in remote areas. If CDEP is apparent in figures 1 and 2, then the effect is not very substantial.

In order to identify the possible effect of CDEP on experience, we compare the experience age profiles for CDEP and non-CDEP workers in remote areas for males and females in the 2008 NATSISS. Note that we condition on living in remote areas because that is where almost all CDEP participants lived in 2008, and hence this enhances the comparability between CDEP and non-CDEP workers. For remote males, CDEP workers only have significantly higher levels of experience than the non-CDEP workers in younger and older age groups (aged 25 to 34 or 55 to 64 year in figure 3).\textsuperscript{7} To the extent that Indigenous workers in remote areas are otherwise similar, the difference between experience for CDEP and non-CDEP workers can be ascribed to the CDEP scheme providing additional employment opportunities that do not exist in communities that do not have the scheme.

\textbf{Figure 3 - Experience by CDEP Status, Indigenous Male Workers in Remote Areas, 2008}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{Experience by CDEP Status, Indigenous Male Workers in Remote Areas, 2008}
\end{figure}

\textit{Note:} The whiskers or error bars represent the 95 per cent confidence intervals.
\textit{Sources:} NATSISS 2008.

\textsuperscript{6}For the 2008 NATSISS, the questionnaire prompted respondents to identify CDEP as employment or a job: "The next few questions are about the job (or business) in which you usually work the most hours, that is your main job. Is that job part of CDEP?"

\textsuperscript{7}The confidence intervals overlap for the 25 to 34 year olds in figure 3, but the difference is significant when one uses pooled standard errors.
While the apparent effect of the CDEP scheme on experience of females has a similar pattern to that observed for males, the magnitude of the effect is larger for every age group among females (figure 4). Furthermore the differential between the reported experience of Indigenous females employed as CDEP and non-CDEP workers, which is again conditional on living in a remote area, is significant for all groups except those aged between 35 and 54, and it is close to significance for those aged between 55 and 64.

Figure 4 - Experience by CDEP Status, Indigenous Female Workers in Remote Areas, 2008

![Experience by CDEP Status](image)

Note: The whiskers or error bars represent the 95% confidence intervals.
Sources: NATSISS 2008 ( Indigenous), HILDA wave 8 ( non-Indigenous).

An argument can be put that the scheme was designed to provide employment experience. Clearly CDEP participation is associated with a higher level of experience than would otherwise be the case, but the differential is not large and we ignore its effect for the following analysis. In any case, it is not possible to easily or convincingly correct for the CDEP effect unless one has longitudinal data on both CDEP and non-CDEP employment over time. In the conclusion we return to this issue because it is possible that the experience attained in CDEP scheme jobs may not be as useful for non-CDEP scheme jobs. If this is the case, then the failure to distinguish the different forms of employment diminishes the measured association between experience and outcomes as CDEP jobs would lead to a tendency to overstate the measure of relevant labour market experience (i.e., in statistical terms it is arguably a ‘bias’ in the estimator).

The age profiles of experience are a useful means of revealing systematic differences in measured experience. However, given that most general surveys do not distinguish between forms of employment that may provide more or less relevant labour market experience, figures 5 and 6 analyse workforce experience data for all employed males and females irrespective of whether they gained that experience in CDEP-scheme jobs. In non-remote areas where broad comparisons are possible, Indigenous people report less experience at almost every age than non-Indigenous Australians. However, the differential is only significant for older males aged over 45. The analogous differentials for females are significant at all ages over 25.
If we focus solely on the Indigenous estimates, then workforce experience of males and females in remote areas is generally less than that indicated in non-remote areas. However, the differential is only close to significance for the two youngest male age groups and the 35-44 year female age group, and the differences are relatively small. Accordingly, not much information is lost by combining remote and non-remote Indigenous data in order to create national benchmarks for the Indigenous population.
While the disaggregation of experience by remoteness in this section has illustrated the distinct nature of the remote Indigenous population, national benchmarks are more credible as an individual’s experience may be gained in both remote and non-remote locations. That is, average data on experience collected over a long period need to abstract from the effects of mobility and the location of individuals even though there is some systematic difference across various geographic areas. Despite the inherent difficulties encountered when measuring national average estimates of experience for Indigenous and non-Indigenous Australians, it is crucial to do this as it allows us to estimate the expected population parameters of experience based on the historical employment outcomes reported above (and provided in the appendix). The next section compares the population estimates of experience reported in table 1 with the average experience in national surveys in order to assess possible ‘bias’ in measured self-reported experience. One challenge for this paper is that we are uncertain about what the true population parameter is for the Indigenous Australians as that population is self-identified and, as mentioned in the introduction, this population may change over time. Accordingly, it is more accurate to refer to the consistency (or inconsistency) of survey and population estimates rather than ‘bias’ per se. However, for ease of writing, in the remainder of this paper we refer to this inconsistency as ‘bias’ and to the statistical notion of bias without inverted commas.

5. How consistent are the survey and population estimates of experience?

In statistical analysis the bias of an estimator is the difference between this estimator’s expected value and the true value of the parameter being estimated (Greene, 2000). The estimator of labour market experience is based on the self-reported data in the respective surveys in which the expected value is simply measured as the survey average. To the extent that the individual is accurately reporting time employed in the labour market, the survey estimate of Indigenous work experience is a representation of experience of an individual who currently identifies as Indigenous. For the following analysis, we have to choose a population parameter of employment from the two values reported in table 1 that were conditioned on age, sex, and Indigenous status. The first panel in that table is the closest to the underlying concept of labour market experience as it is based on the actual historical experience of employment in the respective population (rather than an extrapolation of population estimates for 2011). Unfortunately, Indigenous data before 1981 are either not available or of dubious quality (e.g., Altman, Biddle and Hunter, 2005). Accordingly, the estimates for people aged 45 or over in 2011 may be partially driven by the assumptions that were made to operationalise estimation of population values even though the calculations are still based on population statistics. Readers should give more weight to the estimated ‘bias’ for the younger age groups as those are less likely to be affected by probable measurement error in older census data for the Indigenous population.

Inconsistency or ‘bias’ in this section is measured as reported survey measures of years of employment experience less implied census estimates for the population. This section seeks to compare table 1’s population estimates of experience by Indigenous status and gender with survey estimates of experience. While the
combination of remote and non-remote Indigenous data is arguably important, we argue that the proportion of non-Indigenous people in remote areas is so small that the national estimates will be largely unaffected by assuming that non-remote data from HILDA are consistent with what a truly national survey would indicate.

Table 2 - Measured Inconsistency in Survey Measures of Experience Relative to Population Estimates by Sex and Indigenous Status

<table>
<thead>
<tr>
<th>Age group</th>
<th>Indigenous Male</th>
<th>Indigenous Female</th>
<th>Non-Indigenous Male</th>
<th>Non-Indigenous Female</th>
<th>Difference between Indigenous and Non-Indigenous estimates of inconsistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged 15-24 years</td>
<td>0.33</td>
<td>0.21</td>
<td>-0.87</td>
<td>-1.02</td>
<td>Male: 1.20 Female: 1.23</td>
</tr>
<tr>
<td>Aged 25-34 years</td>
<td>1.74</td>
<td>0.67</td>
<td>-1.74</td>
<td>-0.61</td>
<td>Male: 3.48 Female: 1.28</td>
</tr>
<tr>
<td>Aged 35-44 years</td>
<td>5.82</td>
<td>2.99</td>
<td>-0.59</td>
<td>-0.67</td>
<td>Male: 6.41 Female: 3.65</td>
</tr>
<tr>
<td>Aged 45-54 years</td>
<td>6.29</td>
<td>4.32</td>
<td>-1.71</td>
<td>-0.58</td>
<td>Male: 8.00 Female: 4.90</td>
</tr>
<tr>
<td>Aged 55-64 years</td>
<td>3.12</td>
<td>3.55</td>
<td>-8.35</td>
<td>-3.42</td>
<td>Male: 11.47 Female: 6.97</td>
</tr>
</tbody>
</table>

Sources: NATSISS 2008 and HILDA, wave 8.

Table 2 reveals that the non-Indigenous estimates are highly accurate up till the oldest age group. As indicated above, that group was already of working age when we did not have accurate census data on employment by age (i.e. before 1981). Interestingly the measured ‘bias’ for non-Indigenous males and females aged 45 to 54 is also potentially affected by the assumptions made to generate population values before 1981, but measured experience was relatively ‘unbiased’ for that group. This provides some indication that the extrapolation assumptions are valid in the short-run and that the HILDA sample provides a reasonable estimate of the national non-Indigenous population (at least with respect to experience).

Clearly the estimates of the expected level of experience are less accurate for the older age groups. Interestingly for the non-Indigenous older age groups it leads to a large negative differential between the survey-based and census-based estimates. Given that the Australian economy before 1971 generated full employment, at least for men, the assumption that 1981 employment experience was the same as it was in earlier periods means that the true bias is likely to be a larger negative number (again for men). The fact that the measured ‘bias’ is a large negative number for both men and women probably means that the result may also be driven by recall bias (i.e., respondents may have forgotten some of the work they did when reporting their experience).

For the Indigenous population, the survey estimates are also reasonably accurate for the age groups to 35 years old. However there is substantial ‘bias’ for Indigenous people aged over 35 and, interestingly, this ‘bias’ is in the opposite direction to that for the non-Indigenous population. Clearly it cannot be recall bias unless Indigenous people are remembering a lot of work they did not do (at least after the time of the 1981 census). We have already discounted the possibility that the CDEP scheme leads to substantial ‘bias’ in measured experience so we have to consider other explanations.
One possibility is that the increasing identification of Indigenous people has systematically drawn in Indigenous people who are more likely to have been employed in recent censuses. The Indigenous population is measured at a particular point in time as the people who choose to identify as Indigenous in the census. Over time, the enumeration of Indigenous Australians has increased because of improved coverage of remote areas and other enhanced procedures to engage Indigenous Australians. Another reason why the Indigenous population is growing faster than one might expect, given standard demographic parameters of fertility and mortality, is that Indigenous people feel increasingly comfortable being identified as Indigenous in statistical collections (Hunter and Dungey, 2006). This ‘non-biological growth’ has been very large since the 1960s and could have led to substantial change in the composition of the Indigenous population. Most research in the area acknowledges the issue, but it is very difficult to get a direct handle on the problem (Altman, Biddle and Hunter, 2005). However, Hunter (1998) has provided evidence that compositional change arising from non-biological growth should not affect population-based estimates over the short-run (periods of 10 years or less).

In the context of this paper, if people with longer employment histories chose to identify as Indigenous in later censuses but not in earlier censuses, then the true population estimate of experience estimated from historical census data will be an underestimate. All else being equal, the measured ‘bias’ will tend to be positive for Indigenous population especially where expected experience is based on employment that may have been held many years ago. This is indeed what we observe and hence we have good reason to believe that the population estimates for Indigenous population are particularly unreliable for the older population groups who are more likely to be have been affected by non-biological growth (i.e. some individuals in this group identify as indigenous in the later Censuses but not in the earlier Censuses).

Another possible explanation for measured labour market experience being higher than the apparent historical experience in the population is selective mortality. For example, if persons with a more substantial employment history are more likely to survive into old age, then we would expect the measured ‘bias’ to be positive. While this explanation is consistent with our findings for the Indigenous population, one might expect selective mortality to also be evident in the non-Indigenous population, but it is not. On the balance of probabilities we lean towards the selective nature of non-biological growth driving the Indigenous statistics reported in table 2.

6. Should we use age or experience to explain gaps in Indigenous and other Australian labour market outcomes

There are good theoretical reasons to include experience in empirical models of labour market outcomes. Mincer-like specifications of wages facilitate an economic interpretation of the returns to schooling in wage equations. If we have a direct reliable measure of experience, then we may not need to use information on age and years in education to generate a ‘Mincer’ proxy for experience.

While a greater proportion of the non-Indigenous population survive beyond 65, due to the higher early mortality for the Indigenous population, selective mortality is likely to be an issue in both populations as the healthier, more productive individuals are the least likely to die at an earlier age.
Kalb et al.’s (2014) decomposition of the gap in labour market attachment between Indigenous and non-Indigenous Australians in non-remote areas explains more than half of the gap in employment for men, and almost 80 per cent of the gap for women in terms of observable characteristics. That study used age and age squared rather than experience and experience squared, because it was clear that it was capturing similar information and the parameter estimates for the other variables in the specification that included age were more consistent with theoretical expectations than the specification including experience. For the Indigenous regressions that included age only or experience only (with a full specification of other variables), the sign of marginal effects were identical when significant. The pattern of significance of the other variables was more variable between the specifications—for example, the regression that only included age controls found that having a degree leads to a significant increase in the full-time employment rate whereas the analogous effect of having a degree in the ‘experience-only’ regression was not significant. Given that we have a strong theoretical expectation that education is associated with better labour market outcomes the final decomposition analysis reported in Kalb et al. (2014) focussed on the regressions that only used controls for age.

In the course of conducting the research, Kalb et al. (2014) also estimated regressions that included information on both age and experience; however these results lead to rather implausible findings in the decomposition analysis. Using those estimates, differences in the level of experience between Indigenous and other Australian males explained almost 200 per cent of labour market disadvantage, while eliminating the age differential actually increased the disadvantage of Indigenous males to over 200 per cent of the existing level of disadvantage. Age and experience are highly correlated in most data, and hence it is not unreasonable to expect multicollinearity in the estimation of wage and employment equations when including both age and experience. For example, the correlation coefficient for females in HILDA Wave 8 is over 0.8. Given that multi-collinearity is likely to be an important empirical issue, researchers need to make a decision as to whether they use age or experience in their analysis. This paper illustrates that experience is measured with considerable error at either the individual level or for the population at large, especially for the Indigenous population. In contrast, age is largely exogenous to most economic outcomes and is usually measured with a high level of accuracy and hence it is likely to produce more robust analysis.

There were a few other reasons why Kalb et al. (2014) used age rather than experience besides the fact that the latter is probably measured with considerable error and that the error varied systematically between Indigenous and non-Indigenous samples. Experience was also measured in subtly different ways in HILDA and

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9 This regression analysis is available from the authors on request. Theoretically, the age coefficient would then represent (expected) productivity conditional on work experience, whereas in a specification without work experience one would expect two opposing effects of age as one ages over a certain threshold age – with the net result consisting of a positive effect from work experience and a negative effect from reduced productivity due to age. However, in practice it may be difficult to separately identify the two opposing effects through inclusion of work experience in the specification – especially given the possible measurement error in experience data discussed in this paper.
but the main issue arose from the different types of work experience. Working in the mainstream labour market may be fundamentally different to the community work provided through the CDEP scheme. The former focuses on producing goods and services that can potentially be traded whereas community work could be the end in itself. That is not to say that outputs of CDEP work were of a lower value, or that it did not provide a sense of what it is like to work in the mainstream labour market, but it is not clear that employers would value the experience gained through participation in the scheme as highly as they would employment experience that involved producing more standard goods and services.

In effect, Kalb et al. (2014) found that it does not make much difference whether one uses age or experience in economic analyses anyway. Age was preferred for their empirical work because it is clearly exogenous and it is measured accurately. As this paper demonstrates, experience is measured with considerable measurement error that researchers need to take into account before incorporating the variable in empirical specifications. The systematic ‘bias’ in the measurement of experience in Indigenous and non-Indigenous populations means that it is inappropriate to use it to explain disadvantage in the population (or attempt to measure some gap in labour market experience between the respective populations).

The ongoing differentials in workplace experience are likely to be one of the key explanatory factors of Indigenous economic disadvantage. Indeed, how could one close the employment gap without understanding one of the major factors driving employers’ assessments about worker productivity (how relevant a prospective employee’s workforce experience is for producing the goods and services that their enterprise provides/’sells’)? The relative inexperience of Indigenous workers is likely to be driven by historical exclusion from the labour market and outright discrimination, which in turn may drive relatively low future labour market outcomes (Hunter, 2005; Biddle, et al., 2013). This is arguably an example of cumulative causation as highlighted by Myrdal (1944).

In order to provide evidence about the contribution of any experience gap in perpetrating Indigenous disadvantage, comparable and consistent data on experience needs to be collected for Indigenous and other Australians. While there is nothing ostensibly wrong with the NATSISS or HILDA measures, we argue that experience is best collected in a longitudinal context over an individual’s working life as this allows researchers to better understand the differing qualities of workplace experiences and unpack how relevant experience might be for employers. If a measure of ‘productive’ workforce experience were calculated for individuals, then it would almost by

10 A priori, we expect the HILDA survey to be more accurate than NATSISS data since it is based on longitudinal information that includes calendar data (measured for the previous eight years – as opposed to cross-sectional data measured at a particular point in time). If one assumes that the HILDA method is most accurate for the younger age group, all of whom have had their experience directly derived from the calendar, and experienced relatively buoyant economic conditions for all of their working lives, the error for that subpopulation in the HILDA data will be particularly small. Older Indigenous and non-Indigenous cohorts may have experienced relatively poor labour market conditions or were in the labour force in the late 1970s and early 1980s when the employment to population ratios were generally much lower than they were in 2011.

11 Another theoretical issue raised in finalising the specification was that experience could be conceived as a lagged version of the dependent variable labour force status.
definition have a strong correlation with labour market outcomes. More importantly, it is likely to provide a leading indicator of which groups require additional training to make their skills match the needs of employers.

Labour market experience is an inherently longitudinal phenomenon in that it accumulates over time as an individual experiences more (uninterrupted) spells in employment. HILDA may provide a useful platform for research into the general Australian population, but the absence of a longitudinal survey with a sufficient sample of Indigenous Australians means that experience cannot factor in analysis of Indigenous disadvantage in the near future. Clearly there is a strong argument to prioritise the collection of more longitudinal data on Indigenous people, however it is not clear that sufficient resources are available to do this in the short term. If the resources required form a binding constraint, then it may be possible to pursue other creative strategies to identify deficits in experience. Administrative data collections may provide an alternative option, but this is likely to require a creative collaboration between academics and the authorities controlling these data. Such data would itself have limitations in that it is usually selective with incomplete coverage of the underlying population and the information collected is designed to ensure that programs can be managed rather than to provide insights into statistics representative of various populations. Notwithstanding the challenge for collecting information on Indigenous and non-Indigenous experience in the labour market, it is important to attempt to research the nature of Indigenous employment experience so that Indigenous labour market disadvantage can be effectively addressed.

We now turn to the rhetorical question raised in the title of this paper: Do age and experience always go together? The answer is generally yes, however for the Indigenous population the answer is more complex. Perhaps the answer is that age and experience should be expected to go together, but the fact that this is not necessarily the case means that Indigenous experience may be measured with considerable error, as survey and Census estimates are inconsistent with each other. Accordingly, researchers and policy-makers should carefully consider before using experience to explain Indigenous disadvantage.

Even more concerning is that even the population-based estimates of Indigenous experience are probably systematically biased. If this is driven by the non-biological growth in the Indigenous population, then researchers and policy-makers need to be particularly cautious about measuring gaps in experience between Indigenous and non-Indigenous individuals, and comparing these over the long run, as compositional changes are likely to become more important the further back the historical comparisons go.

12 While the Indigenous sample of HILDA has been augmented in recent waves, it is not representative of the Indigenous population (e.g. with respect to remote areas).
## Appendix

Table A1 - Average age for estimates of experience by Labour force status, Indigenous status, remoteness and gender, 2008

<table>
<thead>
<tr>
<th>Gender</th>
<th>Remote Indigenous</th>
<th>Non-Remote Indigenous</th>
<th>Non-Indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NILF</td>
<td>37.3</td>
<td>41.5</td>
<td>49.9</td>
</tr>
<tr>
<td>Unemployed</td>
<td>29.3</td>
<td>28.1</td>
<td>34.3</td>
</tr>
<tr>
<td>Part-time Employed</td>
<td>33.3</td>
<td>30.4</td>
<td>40.8</td>
</tr>
<tr>
<td>Full-time Employed</td>
<td>37.1</td>
<td>35.9</td>
<td>39.1</td>
</tr>
<tr>
<td>Female</td>
<td>34.7</td>
<td>37.3</td>
<td>45.8</td>
</tr>
<tr>
<td>Unemployed</td>
<td>31.3</td>
<td>30.3</td>
<td>33.9</td>
</tr>
<tr>
<td>Part-time Employed</td>
<td>34.6</td>
<td>35.9</td>
<td>41.3</td>
</tr>
<tr>
<td>Full-time Employed</td>
<td>15.2</td>
<td>36.9</td>
<td>38.8</td>
</tr>
</tbody>
</table>

Sources: NATSISS 2008 (Indigenous), HILDA wave 8 (non-Indigenous).

## References


