

AUSTRALIAN
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From the Managing Editor

Phil Lewis

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Keith Jackson Hancock

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Peter Saunders, Bruce Bradbury and Melissa Wong

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Indigenous and Non-Indigenous Carers

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the CENTRE for
LABOUR MARKET RESEARCH

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From the Managing Editor

Phil Lewis

Things have been quite hectic at the *Journal* with the recruitment of our new administrative team and this has delayed production of this issue. The team is now in place and, hopefully, production of future issues will be more timely.

In December 2015 we sadly said farewell to Editorial Assistant and Subscriptions Manager, Pat Madden, who provided outstanding service to the *Centre for Labour Market Research* and the *Australian Journal of Labour Economics* for over two decades. On behalf of the editors and the editorial board I would like to thank her profusely for her work with the *Journal* and wish her well in her retirement. Pat's outstanding work for the *Journal* has been a major factor in success and we will miss her.

We have finally got an administrative team in place thanks to the generous support of Bankwest Curtin Economics Centre and its Director, Alan Duncan. Chantelle Kietzmann and Kumeshini Haripersad have recently taken over the administrative roles and have done a great job in getting out this issue.

There is much still to be done, including developing a new website, which will include electronic submission of papers, and sponsored workshops with invited leading labour economists, the papers from which will be published in the *Journal*.

Siobhan Austin stepped down as an editor of the *Journal* earlier this year after a long and demanding stint and our thanks go to her. Mike Dockery has joined the team as an editor and he is expected to be a great addition. The existing editorial team will be meeting soon to discuss the *Journal's* future including membership of the editorial team and editorial board. Any suggestions for improving the *Australian Journal of Labour of Economics* will be gratefully received.

Finally, thanks to colleagues who acted as referees, without whom there would no peer reviewing, during the last year: Hielke Buddelmeyer, Munim Joarder, Tomoko Kishi, Riyana Miranti, Alison Preston, Marcia Keegan, Boyd Hunter, Mike Dockery, Phil Lewis, Mark Cully, Anne Daly, Joan Rodgers, Jinjing Li, Ben Freyens, Nick Biddle and Yohannes Kinfu.

Conversations with an Eminent Labour Economist: Keith Jackson Hancock

Boyd Hunter

The interview took place at the Tonsley Campus of Flinders University on 4 December 2015. Note that the interview was conducted by Boyd Hunter (BH) who was talking with Keith Jackson Hancock (KJH):

BH: Thanks for agreeing to be interviewed for the *Australian Journal of Labour Economics*' series of conversations with eminent Labour Economist. Of course you are singularly appropriate to interview in this series as you founded National Institute for Labour Studies (NILS) in 1972, which is Australia's oldest labour studies research centre.

KJH: When I founded NILS it was a rather rudimentary organisation. There were various people working at Flinders University on relevant issues, not only in economics but also in psychology and history. My idea was that we could bring people together to collaborate and perhaps write joint papers on various subjects to do with labour. The person who converted NILS to something more was really Dick Blandy. When Dick took over as Director of NILS, he ceased working as a professor of economics and dedicated himself to the running of the organisation full-time. Having done that he had to find ways of funding the organisation and he was very good at that.

BH: The intellectual heritage of NILS is manifest in the remarkable place in Australian policy history. We have both just attended the 2015 Australian labour market workshop held here at NILS, which fills me with confidence that we have a good future for labour economics in Australia with lots of bright young economists attending, participating and actively engaging in the policy debate.

KJH: I agree that there was an impressive number of young and up-and-coming economists at the workshop.

BH: Perhaps you could give us a brief personal biography for our readers? As a bit of a left field question: Are you related to that renowned Australian Historian (William) Keith Hancock, who employed a narrative based approach to economic history in what has been characterised as the 'Analytical School' (Coleman 2014).

KJH: He was my father's cousin (i.e. a first cousin once removed). His father, an Anglican clergyman who became Archdeacon of Melbourne, was brother to my grandfather. (I never met my grandfather as he was dead long before I was born.) I never really had much to do with the famous Keith Hancock, although I met him from time to time in the 1960s and 1970s at the ANU. I had a few conversations with him and went back to his house once. I read a few things by him including *Australia*, which for its time was probably a best seller (Hancock 1930). He also wrote another well-known book on the Monaro district in New South Wales, but I haven't read that (Hancock 1972). At the time of writing *Australia*, Hancock was much influenced by Edward Shann, the renowned economic historian (Shann 1930). Before his appointment to a Chair at Adelaide University, WKH worked as a historian in Shann's department of economics and history at the University of Western Australia. Shann's influence comes through in *Australia*, which appealed to the conservatives in society (and probably still does).

BH: Yes, but WKH did have several memorable quotes, for example 'Wool made Australia a solvent nation, and in the end a free one (Hancock 1930: 12). While he undoubtedly was an old-fashioned economic historian, he did have less conservative moments such as when he said 'Men do not emigrate in despair, but in hope' (Hancock 1930: 39).

KJH: In his later years he became more radical. For example, he ran a strong (but unsuccessful) campaign against the communication tower on Black Mountain in Canberra.

BH: WKH even contributed to one of my favourite causes, the campaign to save Fraser Island as a wilderness in the 1970s. It may interest you to note that the recent Cambridge Economic History of Australia has cited more of your publications than those of WKH (Ville and Withers 2014). So I don't think you can mount a plausible case that he is the more famous of the Keith Hancocks any longer. However, many of your published research predates the widespread usage of the internet. Given some of our younger readers may only have a passing acquaintance with a library, could you give us some of the major highlights of your academic career in terms of publications?

KJH: Let me say first that I don't have a very long publication list. Many scholars today will have four or five times the number of publications I have in my CV. As to highlights, I think I was one of the pioneers in the discussion of wages policy in Australia. If I were to distil a number of highlights it would be the article on wages policy and price stability in the *Economic Journal* (Hancock 1960) and a series of other that were re-printed in the textbook series, *Australian Labour Relations: Readings*. A chapter in the Report of the Committee of Economic Enquiry (the Vernon Committee) (in 1965), about wage policy, was largely my work. One theme of my research has been the relative merits of arbitration and collective-bargaining. Of course the one substantial book I wrote (other than a textbook) was on the history of Australian wages policy (Hancock 2013).

BH: You are a graduate of Melbourne University, where you got a First Class Honours in Economics and History in 1955, and completed your doctorate at the London School of Economics in 1959. You are one of two Australians who are Honorary Fellows of the London School of Economics, the LSE (along with Joe Isaac). How important was your LSE training to your future career?

KJH: It was very important. Both Joe Isaac and I were lucky to have an outstanding supervisor, Henry Phelps Brown (1959, 1962). Joe had had Henry as a supervisor in the late 1940s and when it came time for me to go overseas it was Joe who suggested I should go to the LSE and he offered to arrange with Henry to take me on as his student. He was a very good supervisor who was largely responsible for me completing my thesis in the minimum allowable time of 20 months.

BH: Wow. Can I ask you what he did to make this happen? Did he put the 'fear of God' into you or did he support you? The carrot or the stick?

KJH: You never had the feeling that there was a stick. However, he did expect you to submit frequent material to him. If a month passed without him receiving something, he would politely enquire what was going on. When you gave him a chapter or part of a chapter, it normally got returned to you with detailed comments within three or four days. A very compassionate man, a very wise man. I benefited from his direct supervision, but most of all I absorbed his way of looking at the world.

BH: So he was more than a supervisor, he was a life mentor.

KJH: Certainly. Another factor was that the LSE was a very good place to work. My thesis topic was based on the UK and so I didn't have to leave the LSE library to get all the information required. I used to turn up at 9:30 AM when the library opened and leave at 5 PM.

BH: We do not want to make the students feel too jealous of bygone days. However your experience is a challenge for supervisors who need to put time into their students if they are going to thrive. In the current 'publish or perish' climate, it is not clear that current supervisors have enough time to provide life mentoring, but it is something to aspire to. I certainly will take careful note of your experience and try to be a better supervisor.

KJH: Since I have retired, I have supervised a few students and I can say that it usually takes a lot of time to do a good job. However I also supervised Josh Healy, who, I must say, was a piece of cake.

BH: Of course you are much more than a labour economist as you were appointed the foundation Professor of Economics in the University of Adelaide in 1964, founded the discipline of Economics at Flinders University in 1966 (along with Mat Polasek and Bob Wallace), before ascending to Vice Chancellor of that university in 1980. Of your career as academic, what was your major achievement in terms of academic administration?

KJH: When I was first appointed (in 1964) to be a Professor of Economics, it was at the University of Adelaide's new campus at Bedford Park. In 1966, the two universities were formally separated and I then became the foundation Professor of Economics at Flinders. My first task was to make the Economics discipline work (we didn't use the word Department). I think we were very successful. For most students we were a second choice to the University of Adelaide, but nevertheless we did attract some very good students. I'm thinking of people such as Don Russell, Kevin Davis, Roger Sexton and Peter Martin among others. Before too long I took on the responsibility of being chairman of the School of Social Sciences which gave me a bit of a taste for administration. Then in 1975 I was asked to be one of two Pro Vice Chancellors to assist the then Vice Chancellor in running the University (it was a 50% appointment, with the rest of the time left for normal academic pursuits). In 1980 I became the Vice Chancellor. Overall I could claim a couple of major successes. "First," I got the economics discipline going. Rather sadly, I have to note that it has disintegrated and it hardly exists now. The other achievement was keeping a young institution functioning effectively. This was achieved, in part, through maintaining good relations with other universities, particularly the University of Adelaide. Another achievement was the establishment of an outstanding medical school which came to full life in the 1980s. Of course the real credit belongs to those in the school, but we provided them a lot of assistance because they deserved it. I used to say to colleagues (to the annoyance of some) that the medical school had the best teachers, the best researchers and the best administrators.

BH: NILS of course still flies the economists' flag today. Indeed the 2016 Australian Conference of the Economists is being run by NILS and will to be held at the Flinders University in the middle of the year.

KJH: I should have qualified my earlier statement about the virtual demise of the economics discipline by saying that NILS now carries the economics flag at Flinders.

BH: The other noteworthy aspect of your career is how you made a seamless transition to being a practitioner as well as a public intellectual. While you continue to hold honorary appointments at Adelaide and Flinders Universities, your initial 'retirement' consisted of leaving the university sector in 1987 to become a Presidential Member of the Australian Conciliation and Arbitration Commission (later the Australian Industrial Relations Commission).

KJH: There was gradual progression or transition into this line of work beginning with a number of public inquiries that I conducted, especially the enquiry into Australian Industrial Relations Law and Systems (sometimes referred to as the Hancock committee). Its recommendations relating to reform of the arbitration system led to the Industrial Relations Act 1988 (Commonwealth Parliamentary Papers, 1985, vol. 17, paper no. 236). My chairing of this enquiry probably led the government to appoint me as Deputy President of the Australian Conciliation and Arbitration Commission (I took up the appointment in in 1987). In effect, though not formally, I succeeded Joe Issac at the Commission. We overlapped by about three weeks.

BH: You participated in several significant national wage decisions, as well as other major decisions such as on the 1989 Pilots Dispute. That must have been a particularly challenging and exciting time given that Australia was fundamentally reforming its industrial relations rules to make a more decentralised system that can respond to the exigencies of a modern economy with all the attendant global pressures?

KJH: I certainly enjoyed working on the national wage cases. The subject matter was interesting and important, and on the whole the advocates we had were good and I could make sense of their arguments.

BH: Do you have any regrets over the directions that Australian Industrial Relations took?

KJH: My biggest disappointment was the outcome of the April 1991 National Wage Case decision, when the Commission refused an application to establish an enterprise bargaining principle. As a result, the government and the ACTU tore up the book.

BH: So the rules fundamentally changed after that date?

KJH: Under the influence of Paul Keating, the government legislated to deprive the commission of its authority to test industrial agreements against public interest criteria. This was part of policy of encouraging the emergence of collective-bargaining, or as it was then known enterprise bargaining. I was very dubious about the merits of enterprise bargaining and I still am. Nevertheless the whole period was still exciting. As you mention, I was heavily involved in the aftermath of the pilots dispute which ran for three or four years. The formal issue in that case was whether the Australian Federation of Air Pilots had called a strike and hence should be deprived of the right to represent the pilots of Australian Airlines (now known as Qantas) and Ansett. The pilots' case was a long, but fascinating, one. My decision in the pilots' case was book-length and is, I think, a good reference for anyone who is still interested in that episode.

BH: The government certainly showed a determination to break the power of that union.

KJH: The pilots union were always a special case. Back in the 1960s and into the 1970s they had their own tribunal, but returned to the jurisdiction of the Arbitration Commission in the 1980s. The pilots union didn't like arbitration, because the airlines had always capitulated to their demands – hence the Federation preferred direct bargaining.

BH: Did this situation reflect the effective airline duopoly which was facilitated by regulations that limited competition from international airlines that flew over the country and largely empty planes?

KJH: That wasn't what precipitated strike, which was caused by limitation of wage increases under the Accord. If the pilots had got their way, the Accord would have been broken.

BH: Ultimately the strike did crystallise the political will to increase competition which in turn further undermined the power of the pilots union. Now I want to get back to your skepticism about enterprise bargaining.

KJH: At the time of the 1991 decision, I and the other members of the bench had a fear that the return to enterprise bargaining would cause a return to the wage breakouts of the 1970s and early 1980s. That fear did not materialise, and on that score I was wrong. The other fear was that it would lead to inequities in the labour market, where workers who happened to have strong union representation would do well, whereas workers who were unorganised or were organised by weak unions would do poorly. In substance I think that is what has happened. The story is complicated by the decline of union membership which has affected many unions. Nonetheless there are still some powerful unions in the transport sector, the mining sector and the public sector. At the time of the 1991 decision, my colleagues and I were skeptical of claims about the predicted beneficial effects of enterprise bargaining on productivity. On that, we were right.

BH: I note with interest that you chaired the National Superannuation Committee of Enquiry (1977) and were a member of inquiries into employment statistics and the financial system (see Hancock Collection at Flinders University). For the South Australian government, you also chaired a Committee of Enquiry into the Racing Industry (1974). You have chosen a very active route to public engagement, but not everyone can follow this path. What do you think is the best way for most economists to engage policy-makers in a constructive debate?

KJH: First of all you have to want to do it! There are a lot of members of the profession without any kind of zest for public engagement. There is of course no need to apologise for being an academic in a University. However, if people do want to engage in the public discourse and directly influence public outcomes, they must want to do it and be willing to speak the language that an informed public will understand. Such people will have to publish articles in newspapers or at least well read magazines, and be prepared to respond to the media. If I might just interpose there—years ago if the media wanted an opinion on economic issues of the day they would talk to a professor; now they would talk to a business economist. I think the reason is that when they talk to a professor they might be told ‘this is not my field’ or be dismissed with ambiguous statements such as ‘on the one hand’/‘on the other hand’, or simply that ‘I don’t know’. You can understand from the perspective of the media, who have to earn a living, that they prefer the economists from the banks and consultancies who are willing to give them a quick answer and are quite willing to predict the date on which the Reserve Bank is going to put up interest rates or what the CPI is going to do in the next three months. I don’t think those predictions are credible, but they go down well with the media. This is a problem that academic ‘commentators’, if they wish to retain their academic integrity, find it difficult to overcome.

BH: I don’t suppose you can blame academics for not wanting to say things that are plainly wrong, but to speak the language in a clear and concise way and simply wanted to communicate your ideas to the public is something that has gone

missing among many academic economist. Did you yourself practice this mode of communication?

KJH: Overall I did a few interviews with the electronic media and occasionally with journalists in the print media. However, I did write articles with a contemporary relevance, which I think were mostly intelligible (e.g., on Wages Policy). I gave papers at conferences attended by non-academics and adapted the content accordingly. One effect of this engagement was that I was seen in government circles as someone who had expertise in industrial relations and hence appeared to have been listened to.

BH: In a sense the incentives of the modern academic is to publish or perish and hence secure funding through writing rather technical and inaccessible publications. Is there some kind of trade-off between perceived academic rigour and the incentives to communicate with the public and policy-makers?

KJH: I was very lucky. I was born in the year which had the lowest birth rate in recorded Australian history. Furthermore I began earning my living in a time when the clientele to which we were catering were the baby boomers. And so people such as myself were in a favourable position. I got my chair at age 28 and that wouldn't happen now. Certainly I would not have got a chair on what I had achieved at that stage judged by today's standards. The pressure on academics in those days was not nearly so intense as they are now. I was able to fit in a full teaching load along with a moderate amount of research and publication, and a deal of engagement in public inquiries and public debate.

BH: I wasn't trying to make you feel guilty Keith, rather that it is important to acknowledge potential trade-offs and choices that modern academics have to make. It is certainly not impossible to engage public debate in the current era, and I think the recent Australian Labour Market Research workshop is a marvellous example of researchers engaging in policy relevant activities with the rigour that involves the latest econometric techniques. On another tack, you have received considerable external recognition via your election as a Fellow of the Academy of the Social Sciences in Australia (ASSA) in 1968, and election as President of the Academy from 1981 to 1984. You have even been appointed an Officer in the Order of Australia in 1987 for your contribution to education and became a life member of the Academy in 1996. The annual Keith Hancock Lecture is part of the Academy Outreach program since 2009. These lectures try to make linkages with your career and works.

BH: John Piggott's 2013 Keith Hancock Lecture starts with a reference to your inquiry into national superannuation in the mid-1970s, that suffered politically from the change in political regime with demise of the Whitlam Government. However, the main analysis in the lecture unpacks the economic policy implications of an aging Australia. Notably the argument creatively combines several areas of economics with other recent economic approaches such as behavioural economics and experimental economics. Given your multi-stranded approach to research, I presume that you approve of this sort of synthetic approach.

KJH: The direct answer to your question is yes. I did indeed listen to John Piggott's lecture and it was excellent. With respect to behavioural economics, it is an area where the discipline has benefited greatly from the insights from psychology and other behavioural sciences.

BH: John King's 2012 Keith Hancock lecture argues that 'economics is unique among the social sciences in having a single monolithic mainstream, which is either unaware of or actively hostile to alternative approaches'. How important is the role of pluralism in economic debate and, if it is important, how should it best be fostered? Did you make any such arguments in your career?

KJH: No not really.

BH: So that was King himself?

KJH: Yes, but there is substance to the issues raised. Yes, there is a central tendency in the profession but that doesn't account for the full range of the discipline as practised. Certainly, there are eminent Australian economists of my generation, such as Max Corden and Ross Garnaut, who by no means were part of a monolithic mainstream.

BH: In a sense that's what we're talking about when we discuss the tensions between the applied economic research and the economic purist. It's tricky to reconcile how the real world institutions operate with respect to economic theory.

KJH: There is probably less tension in labour economics than, say, in financial economics.

BH: Any student of industrial relations or labour economics between the 1970s and 1990s would have been sure to encounter a large number of articles authored by you on their reading list. In your academic work on Australian labour markets, you were one of the pioneers in the use of empirical methods. For example, you developed methods for evaluating the effects of Australia's system of labour market regulation on wage outcomes – such as on the rate of wage inflation and the extent of dispersion in wages earned by workers in different occupations and industries.

KJH: Those things are true but I would have to say the techniques I used were rudimentary and would not be considered respectable in current economic practice.

BH: Yes maybe so, but the data you were using was highly aggregated, as was most of the data available in those days. The Labour Force Surveys did not start until the 1978. Hence the data to which you had access was not amenable to the fine-level econometric analysis that thrives on individual-level data and unit record information. In the 2010 Hancock Lecture, Stuart Macintyre reflects on teaching and research of social sciences in Australian universities and explores their contribution to public policy. What do you think of the state of teaching of labour economics in our universities? Are the number of courses and types of courses adequate? Would you change the way economics is taught? If so, how?

KJH: I don't really know a lot about the current teaching practices, particularly outside Adelaide. There are plenty of good people teaching labour economics around

Australia. Some who come to mind are Jeff Borland, Mike Dockery, Alison Preston and Russell Ross.

BH: In the first interview I conducted in this series, Alison Booth pointed out there has been some tensions in the disciplines of labour economics and industrial relations (especially in the British context that she was more familiar with). Do you think there should be a stronger link between labour economics and industrial relations?

KJH: Yes. In many respects, but not all respects, if you separate them you come up with misleading conclusions. An institution-free labour economics is a half-baked discipline. Likewise, an economics-free industrial relations is often half-baked as well. I pretty much see them as a joint activity.

BH: I suppose it is the fate of many disciplines in the current universities to become fragmented and hence lesser than they would have been had the sub-disciplines remained together.

KJH: I should qualify what I said about industrial relations in that there is a branch of it that is essentially, and could be more properly described as, human relations. That doesn't have much to do with economics.

BH: Nonetheless labour economics and industrial relations can be considered complimentary in a substantive sense. On a related but different tack, do you think that labour economics can and should be viewed as a distinct sub-discipline of economics? If so, what distinguishes it from other economic analyses?

KJH: Labour economics may very well have a greater need for institutional content than other sub-disciplines. Having said that, I note that agricultural economics and monetary economics require a fair degree of familiarity with relevant institutions. Macroeconomics as it is currently practiced is basically institution-free.

BH: On your return to academic life after your stints in the various commissions, you continued to write about both contemporary industrial relations issues and the history of wage setting. Some consider your 2013 book as providing the definitive history of Australian wage fixing up to World War II. I note with interest that the very first Keith Hancock Lecture was on wage inequality. In the 2009 lecture Thomas Lemieux demonstrated wage inequality has been increasing in most industrialized countries over the last three decades. What do you make of the increase in overall inequality?

KJH: Increasing wage inequality does seem to be an international phenomenon. While we do have a problem in Australia, it is a greater one in other countries such as the US. Wage inequality over there has become a very great social problem.

BH: What is driving it? Is there some sort of capital bias in growth or is some of fashion class-based explanation?

KJH: You have to look at the dynamics of the economy as opposed to class-based explanations. The growth of competition from developing countries is important, particularly in the lower skill areas. The computerisation of a great deal of work

has degraded a number of occupations. Another common factor is the decline of unions, which have occurred in Australia as it has elsewhere. Basically the cause of growing inequality is found in economics. You can tell a story that up until the third quarter of the 20th century spread of education was an equalising force. Also a secular decline in agriculture, along with the rise of jobs in manufacturing and the service sector were equalising forces. To some extent these factors came to an end.

BH: The supply of highly educated workers does not seem to have come to an end with an ongoing expansion of education that was demonstrated in the plenary address to the 2015 ALMR by Tom Karmel. In his presentation there was a huge spike in higher education in Australia in 1973, which continued almost unabated in a rather impressive arc to the present day. Karmel showed that of the current cohort of women, over 50% will acquire a degree-level qualification. There is a certain saturation in what you can do with education to address inequality.

KJH: Indeed that saturation may have been reached by the 1970s, and that is where you would have to consider other factors such as the expanding role of China, technology biased growth and the decline of unions.

BH: Richard Freeman (Harvard University) has advocated employee-share schemes as a means of addressing technology bias in growth (e.g., the Fred Gruen Lecture presented on 28 July 2015, 'How to solve the inequality problem that is plaguing capitalism'). His argument was increasing automation has meant that inequality is driven by the ownership of capital (or machines) and therefore workers need to have a greater stake in the capital that determine production (and their productivity). Freeman claimed that the policy options for addressing inequality are circumscribed and apparently convinced Hillary Clinton to adopt a Profit Sharing Plan in her economic platform for her election campaign.

KJH: Yes and we have employee-share schemes in Australia. They are called superannuation. Our (compulsory) super schemes probably don't mitigate wage inequality, but they do mitigate overall social inequality.

BH: How important are wage-setting institutions for shaping societal inequality (given the mobility of capital)? To the extent that labour market institutions differ between various countries, does it mean that wage setting institutions do not actually make that much difference?

KJH: I take your point about the mobility of capital: if we do too much on the wages front, capital may flee. However, I am sceptical about how real that danger is and I wouldn't let it affect my policy choices too much. There is considerable research on the minimum wage in America, which argues that one of the main causes of growing inequality has been the stagnation in the minimum wage. I note there are some proposals in the US for substantial increases in minimum wages. We do have a reasonably good safety net here and that is a reason why the level of inequality in this country has not grown anywhere near the extent it has in the US. Coincidentally, the minimum wage in the UK has been increased dramatically by the Conservative Cameron government. These are encouraging signs that people are really becoming concerned about wage inequality.

BH: When I was talking to Alison Booth in 2014 she highlighted some of the rationales for enhancing the minimum wage, including monopsony arguments (Hunter 2014). What are limits to firms' collective capacity to pay? How would you know when the average firm is paying the marginal value product?

KJH: Your questions go to what are the elasticities of demand for labour? The preponderance of evidence (as Freeman has attested) is that these elasticities are very low. That is, you can do a great deal with minimum wages before you have a perceptible impact on employment.

BH: However, we would expect elasticities to vary considerably amongst industries. For example, they should be higher in sectors exposed to the global economy and the tradable sector. In a sense that gets back to fairness in the labour market in that some industries may only be able to afford lower wage increases.

KJH: Yes, this is where competition from China comes in as that increases elasticity of demand for labour – but that is in some ways mitigated by exchange rates.

BH: It is but another complicating factor is that many businesses choose to outsource their labour requirements offshore.

KJH: What you are talking about is the effect of big differences. The proposition that elasticities are low applies to small differences in wages. So you can ease up the minimum wage without having to worry too much about employment effects. You can't double the minimum wage as that *would* have employment effects.

BH: Finally do you have any advice for people thinking of starting a career out in the profession (of Labour Economics)?

KJH: People starting out in the profession have to be technically proficient (much more proficient than I am or ever had to be). Proficiency is not only required to carry out research, but to understand what other researchers are doing. And the second piece of advice is don't forget to be familiar with the relevant institutions.

BH: And of course find a good supervisor and mentor like Henry Phelps Brown. Apparently a good dose of luck doesn't go astray either. Thanks for your time Keith, I think that is a good place to finish.

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The Growing Gap Between Rich and Poor in Australia

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Abstract

Economic inequality has emerged as a policy issue as recent academic studies have documented the extent of change and raised questions about its underlying causes and economic and social impacts. This paper examines the levels of income and wealth inequality and recent changes using data from the Survey of Income and Housing (SIH) conducted by the Australian Bureau of Statistics (ABS). Attention focuses on where different groups fit in the overall income distribution - how specific assets (particularly owner-occupied housing) affect the distribution of wealth within and between different generations, the joint distribution of income and wealth and how both distributions have changed in recent years. The observed changes cover the period before and after the 2008 financial crisis and have occurred against a background of increases in real income and real net wealth, although the gains have been greater for those at the top of both distributions than for those at the bottom.

JEL classifications: D30; D31; D630

Key words: economic inequality; income distribution; distribution of net wealth; recent trends

1. Introduction and Background¹

Concern over growing inequality has been a feature of recent developments in many OECD countries, including in Australia. The OECD has drawn attention to the issue, arguing that the long-term rise in income inequality ‘does not only raise social and political but also economic concerns: income inequality tends to drag down economic growth’ (OECD, 2015: 3). Although its data indicate that income inequality changed little on average between 2007 and 2011, an increase was experienced in half of the countries covered (17 out of 34). Australia was not one of these, with income inequality declining between 2008 and 2012, although the level of inequality remained above the average, exceeded in only nine countries (OECD, 2014a: Annex Table).

¹ The authors acknowledge the incisive and helpful comments provided by an anonymous referee and the editors, but remain responsible for any remaining errors.

This paper provides a detailed examination of recent changes in inequality of income and wealth in Australia, in order to establish what has happened and assess the distributional impact of the global financial crisis (GFC) which began to exert an influence on Australia towards the end of 2008. It is widely acknowledged that the stimulatory fiscal policy responses introduced in 2008 and 2009 contributed (along with the mining boom) to the Australian economy avoiding the post-crisis recession experienced in many other countries. One would expect the stimulus measures to affect movements in income inequality, since they included a series of one-off payments to many existing recipients of government cash benefits (Saunders and Deeming, 2011) but other factors (including the rise in unemployment and reduction in hours worked) exerted an offsetting influence, making the net effect unclear.

Growing public concern over inequality was brought to a head in Australia in response to the 2014 federal budget that contained many measures that were seen as unfair, resulting in many of them being delayed or rejected in the Senate. Concern about the level of inequality has focused on the ends of the distribution – the gap between rich and poor – with the substantial gains secured by those at the very top contrasting with the more modest gains of those at the bottom. Public sentiment remains opposed to excessive levels of inequality, a recent survey conducted by Oxfam Australia (2014) indicating that 79 per cent of those surveyed think that the gap between rich and poor has widened over the last decade, most of them agreeing that the government should take action to close it. Academic studies report similar findings, Saunders and Wong (2013: Table 2) showing that concern over the rising incomes of the rich increased sharply between 2006 and 2010.

The diverging incomes of rich and poor have been reinforced by policy changes, as Whiteford (2013, 2015) has noted, particularly since the mid-1990s when government policies overall became less progressive and hence less effective in reducing inequality. This period has seen the rich gain most from income tax cuts, while the failure of successive governments to index the level of Newstart Allowance (NSA) has seen the real incomes of the unemployed remain unchanged since 1994, falling well below average community incomes, other social security payments and the poverty line (Saunders, Wong and Bradbury, 2015).² Another issue that has been the focus of much attention is the structure of superannuation-related tax concessions, which are estimated to involve a revenue loss of \$39.6 billion in 2014-15, much of which benefits those with highest incomes. There are many in the community who share the concern expressed by ex-academic economist and now ALP parliamentarian Andrew Leigh (2013, p 141) ‘that we will sleep-walk into a more unequal Australia without realising what is being lost’ if we do not take action to reverse these trends.

Inequality has been attracting increased attention from scholars, with recent contributions from Picketty (2014), Stiglitz (2010) and Atkinson (2015) generating enormous interest internationally – not only among academics but also among the general population. They have been accompanied by important outputs from two major international collaborations – the Luxembourg Income Study (LIS) project (e.g. Gornick and Jäntti, 2013) and the Growing Inequalities’ Impacts (GINI) project (Salverda *et al.*, 2014; Nolan *et al.*, 2014) that have examined recent inequality trends

² The OECD (2010) has called for an increase to restore the adequacy of NSA while the Business Council of Australia (BCA) has pointed to the perverse incentives created by the growing gap between payments for the unemployed and people with a disability (BCA, 2012).

with a view to better understanding what is happening, and why. In Australia, work by The Melbourne Institute's Roger Wilkins (2014a, 2014b, 2015) has examined income inequality using ABS and HILDA data, focusing on changes in cross-sectional inequality using the former and on income mobility and the dynamics of income inequality using the latter. A recent issue of *The Australian Economic Review* contains a Policy Forum 'On the Economics and Politics of Inequality' with contributions from several of Australia's leading economists (see below). The ABS has released a series of Fact Sheets that describe various aspects of well-being and inequality, including the main data sources, definitional issues and recent trends (e.g. ABS, 2013a), while trends in income distribution have been examined by The Treasury (Fletcher and Guttman, 2013), The Productivity Commission (Greenville *et al.*, 2013) and The Australia Institute (Richardson and Denniss, 2014). The issue has also been the subject of a recent Senate Inquiry (Community Affairs References Committee, 2014).

In his Introduction to the Policy Forum mentioned above, McDonald (2015: 66) expresses the hope that 'the current surge of interest in inequality may lead to an increased research effort into both the causes and consequences of inequality'. The role of political forces is highlighted in contributions from Frijters and Foster (2015) and Triffit (2015), the latter arguing (p. 78) that the welfare sector has ceded ground to the business lobby in the debate over growing inequality, leaving the poor and disadvantaged 'voiceless in the shaping of policy decisions that have an acute impact on them'. Whiteford's (2015) analysis leads him to conclude (p. 89) that although the evidence on the socioeconomic impact of rising inequality is unclear; '...the evidence for social gradients is compelling'. While these aspects of inequality are important, the focus of this paper is on measurement, including which groups are at the bottom of the income distribution and the role of housing wealth in shaping overall wealth inequality – factors that have clear implications for tax and welfare policy. The analysis builds on that presented to the Policy Forum by Whiteford (2015) and Wilkins (2015). Whiteford (2015: Figure 1) shows that the longer-term trend in income inequality is upwards (reaching a peak in 2007-08) and identifies several policy failings that have allowed this to happen, including a fall in the redistributive impact of direct taxes. Wilkins' analysis (2015: Figure 1) confirms this broad upward trend in income inequality, but shows how different data sources and income measures exert a considerable influence on short-run movements around the longer-term trend. Neither author examines the distribution of wealth and how it relates to the distribution of income, but both aspects are given prominence in the analysis that follows.

Against this background of growing interest in, and concern about, economic inequality, this paper draws on data from recent ABS surveys to examine the extent of income and wealth inequality in 2011-12 and recent changes. Such an approach is needed because concepts such as 'rich' and 'poor' cannot be adequately captured by focusing on either income or wealth in isolation – particularly in the Australian context where home ownership plays an important role in shaping both distributions, not only among the aged but also between aged and non-aged groups (Yates and Bradbury, 2010). The role of housing wealth is thus given particular attention by examining the joint distribution of income and wealth among those aged below and above 65. The methods used to produce the results are explained in Section 2, while Sections 3 and 4 present the main findings on the distributions of income and wealth and recent trends therein, respectively. The main conclusions are summarised in Section 5.

2. Data Sources and Methods

The data source for most academic studies of the distributions of income and wealth in Australia is the confidentialised unit record files (CURFs) based on the *Survey of Income and Housing* (SIH) conducted biennially by the ABS.³ The SIH is conducted across the four quarters of the financial year and the reported quarterly incomes have been adjusted to allow for the rise in consumer prices that took place over the course of the year by expressing all incomes in the prices that prevailed mid-way through the year, i.e. at the end of December in each year. Income is collected in these surveys in current form (i.e. in the week before the survey) and in annual form (i.e. over the previous financial year).⁴ The estimates reported below are based on current (weekly) income, which is the measure used by the ABS when presenting its main findings (see ABS, 2013b: Table 1). Wilkins (2015, p 96) argues that the annual income measure ‘is the more natural accounting period for measuring most components of income’ and is used in most international comparisons of income distribution (including by the OECD in the reports cited earlier and later). Against this, the use of weekly rather than annual income allows a better match of household characteristics (which may change over the course of a year) with reported income, and also means that the latest data are more recent (because the annual data have a one-year lag). The ABS also claims that some income components (specifically income from government pensions and allowances) appear to be more accurately reported on a weekly basis. The advantages implied by these considerations are reinforced by Wilkins’ (2014a) estimates, which show that the weekly income series better captures recent ABS measurement changes (see below) and that the ABS weekly income data better track the HILDA (annual) income series than the ABS annual income data.⁵ For these reasons, we base our analysis on the weekly income measure.

The key variable in the income analysis is disposable income, which is defined as gross income from all sources minus (estimated) personal income tax and other income-related levies like the Medicare levy and surcharge. Households reporting zero or negative values of disposable income have been excluded from the analysis, on the grounds that income is unlikely to provide a reliable indicator of the living standards of these households.⁶ Differences in household needs are adjusted for by deriving equivalised disposable income (EDY), which is equal to disposable income divided by the modified OECD equivalence scale.⁷ The EDY variable captures the ability of income available for spending to meet the consumption needs of the household, and is now widely used in studies of income inequality (and poverty) conducted in Australia (e.g. Wilkins, 2014a, 2015; Phillips *et al.*, 2013) and elsewhere (e.g. Jenkins, 2015) and

³ The HILDA data are being increasingly used to examine the distributions of income (Wilkins, 2014b; 2015) and wealth (Wilkins, 2013) although the focus here is on the use of ABS data.

⁴ Although the ABS provides estimates of imputed rent in its latest income distribution analysis (see ABS, 2013: Table 18), these estimates are not available for earlier years and have not been included in the definition of income used in this analysis.

⁵ Wilkins (2014a: Figures 5 and 6 and Table 5 and 2015: Figure 1) presents comparisons of movements in inequality based on the ABS weekly and annual series and the HILDA (annual) income variable. The results lead him to conclude (2014a, p 78) that: ‘the SIH annual series is the outlier of these three series’.

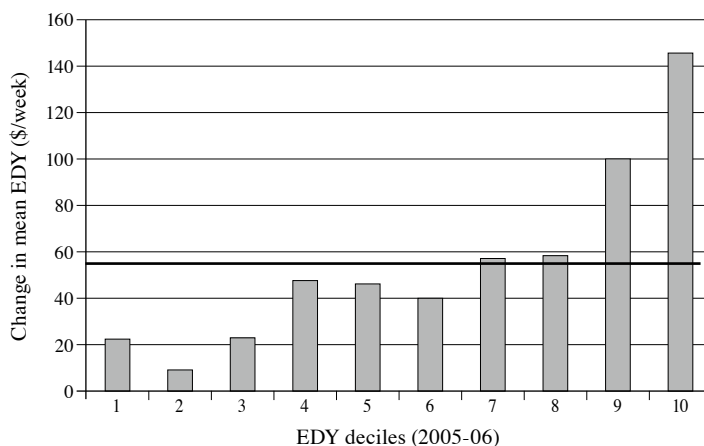
⁶ This exclusion results in the removal of 93 households (out of a total sample of 14,569, equivalent to 0.64 per cent).

⁷ The OECD scale assigns a score of 1.0 to the first adult in the household, 0.5 to each subsequent adult and 0.3 for each child (defined as those aged under-15).

by international bodies like the OECD (2008, 2011). It is assumed that all people in the household have the same living standard, and (except where otherwise indicated) we describe the distribution of equivalent household disposable income among persons.

Over the period covered by this analysis, the ABS has introduced a series of measurement changes to improve the quality of its income data, most recently in 2007-08 (see ABS, 2009: Appendix 4). These changes impact on measured inequality in each year and need to be taken into account when estimating inequality and (particularly) when examining changes over time. In some cases, this can be done by continuing to use earlier income definitions which have been calculated for some later years. For example, estimates based on the latest income measure are only available from 2007-08 onwards, whereas estimates based on the changes introduced in 2005-06 are available from then up to 2011-12. The ABS summarised the changes introduced in 2007-08 as including, for the first time, more comprehensive estimates of 'non-cash benefits, bonuses, termination payments and payments for irregular overtime worked' and stated that 'most of the changes have been to the scope of employment income and at the higher end of the income distribution i.e. fourth and highest quintiles' (ABS, 2009, p 61 and 63). (ABS, 2009, p 61).⁸ In fact, as Figure 1 indicates, the latest measurement change impacted on mean incomes across the entire distribution, not just at the top end. Despite this, Wilkins (2014a) confirms the ABS claim, finding that the overall impact was to increase measured inequality.

Figure 1: Impact of the 2007-08 Income Measurement Change on Income Distribution (mean change in equivalised disposable income, EDY, by pre-change EDY decile)



Source: Author calculations based on SIH 2011-12, CURF.

⁸ The ABS estimated at the time that this change affected 3.4 million (43 per cent) households, resulted in an increase in mean weekly gross household income of \$85 (5.2 per cent) and an increase in the Gini coefficient from 0.319 to 0.331 (3.8 per cent) (see ABS, 2009: Appendix 4 and Kindermann and McColl, 2012).

Unlike Wilkins (2014a), no attempt has been made to directly adjust for the definitional changes introduced by the ABS in 2007-08 over the period covered by the analysis reported here, i.e. 2005-06 to 2011-12. Instead, comparability has been achieved by employing the income definition applying in 2005-06, which is available on a consistent basis over the sample period. As noted, income data based on the most recent measure are only available from 2007-08, but wealth estimates are not available for that year, hence our focus on the period since 2005-06. When conducting the inequality trend analysis, current year monetary estimates have all been expressed in 2011-12 dollars by adjusting by movements in the CPI.

Net wealth is defined as the sum of the following five main components of wealth: estimated value of own home (less mortgage); estimated (net) value of other real estate; estimated (net) value of other non-financial assets; balance of government and non-government superannuation accounts; estimated (net) value of shares, business and financial assets; minus the estimated value of other debts.⁹ Compared to income distribution research, there is less of a consensus in the literature about the most useful way to report household wealth distributions. From one perspective, wealth represents the potential for future consumption, which suggests that it should be pooled within the household, equivalised and counted in the same way as income. However, in many circumstances, wealth held by a household at a point in time will be used to finance future consumption in circumstances when the household composition may differ from that at the time of observation – for example, when people retire or when wealth is passed on to descendants. In this case, equivalising to adjust for current household circumstances will not be appropriate, and a more straightforward accounting of wealth might be more informative. Wealth can also be seen as representing social power, in which case adults in the household might be considered differently from children (as in the case of the OECD income equivalence scale described earlier).

Three examples of recent international research on the distribution of wealth follow these different approaches. Jantti, Sierminska and Van Kerm (2013), examine the equivalent wealth of persons, Sierminska, Smeeding and Allegrezza (2013) examine household wealth without equivalisation (though it is not clear whether they count households or persons) and a report by Credit Suisse Research Institute (Shorrocks, Davies and Lluberas, 2014) describes the distribution of per-adult wealth across the adult population. Most Australian studies of the distribution of wealth follow the second approach, with no equivalence adjustment and examining how wealth is distributed among households (ABS, 2013c; Headey, Warren and Wooden, 2008). However, in order to make our comparison with income distribution as straightforward as possible, the analysis that follows reports the distribution of wealth using the first of these approaches. That is, we examine the distribution of equivalent household wealth of persons, in the same way that we examine the distribution of the equivalent household income of persons, with the joint distribution of both variables thus consistent and meaningful. In both cases, each quantile/quintile contains the same number of individuals.

⁹ It should be noted that these wealth components do not add up to the Total Net Wealth variable provided on the latest CURF. The ABS has advised the authors that there are (minor) errors in the total wealth variable provided on the CURF, and that summing the components provides the best estimate of net wealth. The definition of wealth is very similar across the period, although in the earlier years there is less disaggregation of investment wealth and liabilities (which might imply an under-estimation if these components were not included elsewhere).

Our analysis of the distribution of wealth and the joint distribution of income and wealth are (for consistency) both based on the most recent definitions of both variables. This differs from the approach used to examine changes in the income distribution and this difference needs to be kept in mind when reviewing the results. As in the case of the income inequality analysis, all wealth values are reported in 2011-12 dollars, using the CPI to inflate estimates for the earlier year. Because the Gini coefficient is not necessarily bounded between zero and one if some households have negative wealth (as some do), negative wealth values have been set to zero prior to calculation of the Gini coefficient – although this has a negligible impact on the results reported. The summary measures of both income and wealth inequality are basic quintile shares (of the relevant variable) supplemented by the shares of the top and bottom 10 per cent and 5 per cent of the distributions to capture what is happening in the extremes of both distributions.

3. Results

3.1 *Income Inequality*

As noted above, two basic adjustments were made to the raw income data before the distributional analysis was conducted: the quarterly data within each year was adjusted by movements in the CPI over the year so that the observations are all centred on the mid-year; and households reporting a zero or negative value for disposable income were removed. However, the top rows of each panel in Table 1 show what the ‘raw’ data imply for income inequality in 2011-12, before any of these data adjustments have been applied and before equivalisation. (All our tables have two panels. The top panel shows characteristics of the top and bottom 5 and 10 per cent and the totals, and the bottom panel the characteristics of each of the quintile groups). It is clear from the other rows that the CPI adjustment has almost no impact on the distributional measures shown here and is not discussed further. Table 1 also shows what impact the exclusion of zero and negative incomes and the equivalence adjustment have on the measured income distribution.¹⁰ The exclusion of zero and negative incomes causes inequality to fall (by definition), but not by much – across the income quintiles, the income shares change by no more than 0.2 percentage points in the case of unequivalised income, and by even less in the case of equivalised income.¹¹ Applying the equivalence scale has a larger impact on inequality, particularly at the bottom of the distribution, where many households with low income are single people (e.g. full-rate pensioners), who move up the distribution after the equivalence adjustment is applied.

¹⁰ The unequivalised income measures shown in Table 1 show the distribution of actual disposable income among households.

¹¹ For both unequivalised and equivalised income, the post-CPI and exclusion adjustment distributions satisfy the Lorenz domination criteria (Atkinson, 1970), which unambiguously implies more equality. The post-CPI and exclusion adjustment distribution of equivalised income is also more equal than that of unequivalised income.

Table 1: Sensitivity of the Income Distribution to Data Adjustments in 2011-12 – mean incomes (\$/week) and income shares (%) (in brackets)

	<i>Bottom 5%</i>	<i>Bottom 10%</i>	<i>Top 10%</i>	<i>Top 5%</i>	<i>Total</i>
<i>Unequalised income:</i>					
No CPI adjustment; no exclusions	226 (0.6)	359 (2.0)	4546 (25.1)	5601 (15.5)	1810 (100.0)
CPI adjustment & zero/negative incomes excluded	298 (0.8)	403 (2.2)	4552 (25.0)	5605 (15.4)	1819 (100.0)
<i>Equalised income:</i>					
No CPI adjustment; no exclusions	166 (0.9)	259 (2.8)	2255 (24.5)	2805 (15.3)	919 (100.0)
CPI adjustment & zero/negative incomes excluded	211 (1.1)	284 (3.1)	2258 (24.4)	2810 (15.2)	924 (100.0)
	<i>1</i>	<i>2</i>	<i>Quintiles:</i>		
			<i>3</i>	<i>4</i>	<i>5</i>
<i>Unequalised income:</i>					
No CPI adjustment; no exclusions	532 (5.9)	1084 (12.0)	1589 (17.6)	2158 (23.9)	3687 (40.7)
CPI adjustment & zero/negative incomes excluded	558 (6.1)	1092 (12.0)	1595 (17.5)	2163 (23.8)	3693 (40.5)
<i>Equalised income:</i>					
No CPI adjustment; no exclusions	342 (7.5)	581 (12.7)	795 (17.3)	1060 (23.1)	1818 (39.6)
CPI adjustment & zero/negative incomes excluded	356 (7.7)	584 (12.7)	797 (17.3)	1062 (23.0)	1820 (39.4)

Source: SIH 2011-12, CURF.

Information on the distributional profile of selected socio-demographic groups in 2011-12 using the 2007-08 income measure is provided in Table 2. The measure used for this purpose is the share of each group in the different quantiles of the overall distribution of equalised income (measured on the latest, 2007-08, basis). If the group was randomly distributed across the distribution, these shares would be similar to those that define the quantiles themselves, i.e. 5 per cent, 10 per cent, or 20 per cent. The difference between these hypothetical shares and those that actually exist thus provides an indication of how well the group is faring, distributionally.

In terms of the main divergences, groups that are heavily concentrated in the lower portion of the distribution (the bottom two quintiles) are older people (where the concentration is 70.6 per cent), single people (57.9 per cent), and lone parent families (69.2 per cent). Even larger differences exist for those mainly reliant on a government pension or allowance (96.1 per cent) and unemployed households (78.5 per cent). The former concentration reflects the fact that the social security system provides an income floor (or safety net) in times of need, while the latter highlights the low level of Newstart Allowance referred to earlier. The groups that are disproportionately represented in the top two quintiles are those mainly reliant on income from a wage or salary and those employed full-time. Employment is thus an important factor driving the shape of the income distribution, both at the top (through the earnings it generates) and (through its absence) at the bottom.

Table 2: Distributional Position of Specific Socio-demographic Groups
(row percentages of people in each demographic group)

	<i>Bottom 5%</i>	<i>Bottom 10%</i>	<i>Top 10%</i>	<i>Top 5%</i>	<i>Total</i>
Children (aged under 15)	5.5	9.9	6.7	3.3	100.0
Older people (aged 65+)	4.7	18.4	4.1	2.5	100.0
Single people	8.6	27.1	7.7	4.3	100.0
Lone parent families	9.0	16.2	0.7*	0.6*	100.0
Couples with children	4.7	7.9	8.7	4.2	100.0
Primary income source is wage and salary	1.3	2.3	12.6	6.0	100.0
Primary income source is government pensions and allowances	14.4	35.7	0.0*	0.0*	100.0
Employed full-time ^(a)	1.3	2.0	14.6	7.2	100.0
Unemployed ^(a)	31.5	45.6	0.2*	0.2*	100.0
Born in Australia ^(b)	4.2	9.3	11.1	5.5	100.0
Born in a non-English-speaking country ^(b)	7.1	12.7	7.6	3.6	100.0

	<i>Quintiles:</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Children (aged under 15)	20.6	24.4	24.1	17.6	13.3
Older people (aged 65+)	44.9	25.7	13.2	9.3	6.9
Single people	43.5	14.4	15.3	13.4	13.5
Lone parent families	36.0	33.2	19.5	8.8	2.5
Couples with children	15.0	21.6	23.9	21.7	17.9
Primary income source is wage and salary	6.0	17.8	24.0	26.2	26.1
Primary income source is government pensions and allowances	69.7	26.4	3.8	0.1*	0.0*
Employed full-time ^(a)	5.5	15.7	23.1	26.8	28.9
Unemployed ^(a)	58.9	19.6	12.2	4.2*	5.1*
Born in Australia ^(b)	18.3	18.9	19.3	21.0	22.5
Born in a non-English-speaking country ^(b)	25.5	21.5	18.8	18.9	15.3

Notes: ^(a) Based on the labour force status of the Household Reference Person; ^(b) For adults only; An asterisk (*) indicates that the estimate has a relative standard error (RSE) that exceeds 25 per cent. *Source:* See Table 1.

3.2 Wealth Inequality

Estimates of the distribution of net wealth among persons in 2011-12 are shown in Table 3.¹² Separate distributions are shown in order to highlight the role of (net) housing wealth and age (which are related). In terms of wealth holdings across all persons, over three-fifths (61.0 per cent) of net household wealth was held by the wealthiest 20 per cent of individuals. This compares with the share of the lowest quintile of one per cent, implying a top-to-bottom quintile share ratio of 61 to one, far above the corresponding

¹² It should be noted that all of the wealth distribution estimates presented here are based on responses to a household survey. Given the likelihood of non-response and under-reporting, the share of wealth held by those at the top is almost certainly an under-estimate. Shorrocks, Davies and Lluberas (2014: Table 4-4) report synthetic estimates which take into account national 'rich lists' of the wealth held by the richest individuals. On this basis, the top 10 per cent of Australian adults (not households) are estimated to hold 51 per cent of the wealth (compared with the household top 10 per cent share of 43.8 per cent shown in Table 3), leading the authors to conclude that the share of wealth held by the richest 10 per cent is relatively low in Australia compared with other countries – mainly because of the high level of home ownership.

income quintile share ratio of just above 5 to one (Table 1; final row). The richest 10 per cent have over 43 per cent (more than 4 times the no inequality share), while the top 5 per cent hold over 30 per cent of all wealth (6 times their share if there was no inequality). Wealth is more equally distributed (particularly at both extremes of the distribution) among people aged 65 and over than among those aged under-65, although the differences are not that large. The lowest quintile of older people have only 2.7 per cent of all older person wealth while the lowest two quintiles together hold just over 11 per cent of the total. Not surprisingly, the average level of wealth is higher among older people, at over \$666,000, more than 80 per cent higher than the average wealth holding of households aged under-65 (\$370,000).

Table 3: The Distribution of Wealth by Age in 2011-12 – mean net worth (\$'000) and net worth shares (%) (in brackets)

	<i>Bottom 5%</i>	<i>Bottom 10%</i>	<i>Top 10%</i>	<i>Top 5%</i>	<i>Total</i>
<i>All households</i>					
Equivalent net wealth	-3.2 (-0.0)	5.2 (0.1)	1810.3 (43.8)	2534.3 (30.6)	413.7 (100.0)
Own home (less mortgage)	-2.8 (-0.1)	-1.4 (-0.1)	550.6 (33.1)	666.0 (20.0)	166.7 (100.0)
<i>HRP aged under 65</i>					
Equivalent net wealth	-4.8 (-0.1)	3.6 (0.1)	1637.0 (44.3)	2280.3 (30.9)	369.8 (100.0)
Own home (less mortgage)	-3.3 (-0.1)	-1.6 (-0.1)	495.7 (34.9)	610.5 (21.6)	142.0 (100.0)
<i>HRP aged 65 and over</i>					
Equivalent net wealth	10.7 (0.1)	26.0 (0.4)	2618.4 (39.4)	3586.7 (27.1)	666.1 (100.0)
Own home (less mortgage)	0.0 (0.0)	0.9 (0.0)	747.0 (24.3)	921.1 (15.1)	308.3 (100.0)
	<i>Quintiles:</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>All households</i>					
Equivalent net wealth	21.2 (1.0)	113.1 (5.5)	243.8 (11.8)	428.0 (20.7)	1261.5 (61.0)
Own home (less mortgage)	0.6 (0.1)	37.7 (4.5)	127.0 (15.2)	226.6 (27.2)	441.0 (53.0)
<i>HRP aged under 65</i>					
Equivalent net wealth	18.1 (1.0)	96.4 (5.2)	212.7 (11.5)	383.3 (20.7)	1138.5 (61.6)
Own home (less mortgage)	-0.2 (-0.0)	27.6 (3.9)	100.6 (14.2)	190.9 (26.9)	391.2 (55.1)
<i>HRP aged 65 and over</i>					
Equivalent net wealth	90.9 (2.7)	288.9 (8.7)	432.8 (13.0)	678.6 (20.3)	1835.5 (55.3)
Own home (less mortgage)	44.4 (2.9)	201.5 (13.1)	289.0 (18.8)	394.9 (25.5)	610.8 (39.7)

Note: HRP = Household Reference Person.

Source: See Table 1.

Table 3 also highlights the equalising effect of home ownership, which accounts for around 40 per cent of total wealth holding overall, slightly less than this among those aged under 65, but over 46 per cent of the total wealth of older people. Taking account of housing wealth results in the share of net wealth owned by the top quintile declining across the whole population, as well as among those aged below and (particularly) above aged 65. In fact the distribution of net housing wealth among older people shown in the final row of Table 3 is (except at the bottom) similar to the distribution of income among the whole population shown in the final row of Table 1.

3.3 The Joint Distribution of Income and Wealth

The joint distribution of income and wealth is shown in Table 4, which shows a breakdown by age but not the totals (for reasons of space – these results are available on request from the authors).¹³ These results indicate that for those aged under 65, those in the bottom and top income quintiles are both more than twice as likely to be in the bottom and top wealth quintiles, respectively. This relationship is stronger among those with the lowest 5 per cent of incomes and even stronger among those with the lowest 10 per cent of incomes. (All the ‘diagonal’ cells in the table are highlighted in bold). However, the relationship between income and wealth is strongest at the very top of the distribution with 33.1 per cent of those in the top 5 per cent of the income distribution also in the top 5 per cent of the wealth distribution. The pattern of joint quintile shares shown across the diagonal cells of Table 4 is as expected, with the two extreme percentages higher (because movement can only be in one direction) than those in the middle three joint quintiles.

Among those aged 65 and over the pattern of a weaker association at the bottom than at the top is even more prominent – as can be seen by comparing the diagonal quintile group shares, again shown in bold. For the older group, those in the lowest 5 per cent income groups are less likely than expected (3.0 per cent rather than 5 per cent) to also be in the low wealth groups, while those in the lower income groups generally are quite likely to have middle to high wealth (see the lower left-hand cells). A plausible explanation for this pattern is the existence of considerable numbers of older people with substantial assets held in non-income-generating form, who receive a reduced or zero pension because of the pension asset test.

¹³ Although not shown in Table 4, the aggregate analysis indicates that wealth is more equally distributed across the income quintiles than across the wealth quintiles. This is consistent with the pattern of inequality recently described by Whiteford (2013).

Table 4: The Joint Distribution of Income and Wealth by Age in 2011-12

<i>Within-age household equivalent wealth group</i>	<i>Within-age household equivalent income group</i>				
	<i>Bottom 5%</i>	<i>Bottom 10%</i>	<i>Top 10%</i>	<i>Top 5%</i>	<i>Total</i>
<i>HRP aged under 65:</i>					
Bottom 5%	14.2	20.3	0.9	0.5	5.0
Bottom 10%	25.0	34.0	1.2	0.5	10.0
Quintile 1	36.6	46.3	3.1	1.1	20.0
Quintile 2	14.2	13.6	8.6	5.3	20.0
Quintile 3	16.0	14.6	14.2	8.9	20.0
Quintile 4	16.2	13.4	18.1	13.9	20.0
Quintile 5	17.0	12.0	56.0	70.8	20.0
Top 10%	8.1	5.4	36.5	51.5	10.0
Top 5%	3.3	2.0	21.4	33.1	5.0
All	100.0	100.0	100.0	100.0	100.0
<i>HRP aged 65 and over:</i>					
Bottom 5%	3.0	5.4	.	.	5.0
Bottom 10%	7.6	11.0	2.0	.	10.0
Quintile 1	17.2	21.4	6.9	6.4	20.0
Quintile 2	14.9	17.1	1.8	0.9	20.0
Quintile 3	13.9	20.7	7.2	4.7	20.0
Quintile 4	34.5	26.6	13.5	6.8	20.0
Quintile 5	19.5	14.2	70.5	81.2	20.0
Top 10%	10.4	6.3	52.9	65.6	10.0
Top 5%	1.6	1.3	32.4	46.9	5.0
All	100.0	100.0	100.0	100.0	100.0
			<i>Quintiles:</i>		
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>HRP aged under 65:</i>					
Bottom 5%	15.9	5.6	1.3	1.3	1.0
Bottom 10%	28.7	13.3	4.3	2.3	1.5
Quintile 1	43.0	27.9	14.0	11.0	4.5
Quintile 2	16.6	23.6	23.6	22.3	14.0
Quintile 3	15.8	21.5	25.5	20.5	16.6
Quintile 4	13.4	16.6	24.1	25.1	20.7
Quintile 5	11.2	10.5	12.9	21.1	44.2
Top 10%	4.6	5.1	5.3	9.0	25.9
Top 5%	2.2	2.5	2.5	3.8	14.0
All	100.0	100.0	100.0	100.0	100.0
<i>HRP aged 65 and over:</i>					
Bottom 5%	8.9	8.7	4.3	3.1	.
Bottom 10%	14.9	16.4	9.8	7.4	1.6
Quintile 1	27.5	30.9	19.4	13.6	8.7
Quintile 2	21.9	26.8	21.9	19.9	9.6
Quintile 3	22.3	24.1	23.6	19.5	10.3
Quintile 4	19.2	12.2	25.3	25.7	17.5
Quintile 5	9.1	6.0	9.8	21.3	53.8
Top 10%	4.1	2.6	2.8	6.9	33.5
Top 5%	1.1	1.0	1.6	2.3	18.9
All	100.0	100.0	100.0	100.0	100.0

Note: As explained in the main text, the latest (2007-08) income definition has been used to construct this table.

Sources: see Table 1.

4. Recent Trends in Inequality

As noted earlier, the income measurement changes that the ABS has introduced in recent SIHs to improve the quality of the income data collected make it difficult to track changes over time.¹⁴ Given that the SIH is currently conducted every second year, the best period on which to base such an analysis would be by comparing results for 2011-12 with those for 2007-08. However, while this can be done for income, it has already been noted that wealth data were not collected in 2007-08, only in 2005-06. For this reason, the analysis of recent changes that follows examines changes over the period 2005-06 to 2011-12, an approach that requires us to use the 2005-06 income measure in order to maintain comparability.

Changes in the distributions of income and wealth between 2005-06 and 2011-12 are summarised in Table 5, which also includes the income inequality estimates for 2007-08 for completeness. It is important to note that the period was one in which average levels of both income and wealth increased in real terms – by 13.4 per cent in the case of income, and by 6.9 per cent in the case of wealth. Income inequality displays a clear pattern, increasing in the initial (pre-GFC) period then declining between 2007-08 and 2011-12, and ending up virtually the same at the end of the period as at the beginning.¹⁵ The increase in the earlier sub-period and the decrease in the later sub-period are both statistically significant but the change over the period as a whole is not. This picture of overall stability conceals differences in how those at different points in the income distribution fared over the period. Thus, while not shown in Table 5, the mean real (equivalised) incomes of those in quintiles 1 and 3-5, the top 10 per cent and the top 5 per cent all increased by around 13 per cent, those in quintile 2 experienced an increase of almost 15 per cent, while income growth for those in the lowest 5 per cent and 10 per cent averaged only 2 per cent and 10 per cent, respectively. The rising tide thus did lift all boats, but not to the same degree with those at the very bottom missing out almost entirely.¹⁶

Inequality in the distribution of wealth increased slightly overall between 2005-06 and 2011-12, although this difference is not statistically significant. However, this conceals the somewhat more nuanced picture that emerges when the changes at the very top are examined, this revealing a substantial (but again not statistically significant) decline in the share of the top 5 per cent of almost one percentage point. The picture becomes further complicated when the distribution is broken down by age, where an almost significant increase in the Gini coefficient among those aged under 65 ($t = 1.6$) contrasts with no significant change for those aged 65 and over ($t = 0.8$). What is striking here is the differing changing fortunes of those at the top of the two distributions: for those aged under 65, the share of wealth owned by the top quintile, top decile and top 5 per cent all increased, while for those aged 65 and over the wealth shares of all three richer groups declined substantially – by 3.2, 5.3 and 7.3 percentage points, respectively – although none of these changes are statistically significant. Further examination would

¹⁴ We agree with Wilkins (2014a: 88), who has expressed the hope that; ‘future revisions to ABS concepts and survey methods for its household income survey collections will be kept to a minimum’.

¹⁵ This pattern is consistent with that estimated by the OECD and cited earlier (see OECD, 2014a: Annex Table), and with that estimated by the ABS (2013a: Table 1), despite the OECD’s use of annual rather than weekly income (and a different equivalence scale).

¹⁶ It is also important to recall that those with zero or negative incomes have been removed from the sample.

be needed to identify what caused these diverging patterns, although it seems likely (and is consistent with the evidence) that the decline in the stock market after the GFC played an important role for those older people with significant investment portfolios.

Table 5: Changes in Income and Wealth Inequality, 2005-06 to 2011-12 (share percentages)

	<i>Bottom 5%</i>	<i>Bottom 10%</i>	<i>Top 10%</i>	<i>Top 5%</i>	<i>Gini coefficient</i>
<i>Income Inequality^(a):</i>					
2005-06	1.3	3.3	23.5	14.4	0.303
2007-08	1.2	3.1	24.9	15.8	0.319
2011-12	1.2	3.2	23.4	14.3	0.302
<i>Wealth Inequality (total):</i>					
2005-06	0.0	0.2	43.6	31.5	0.580
2011-12	-0.0	0.1	43.8	30.6	0.590
<i>Wealth Inequality (HRP under 65):</i>					
2005-06	0.0	0.2	43.1	30.4	0.579
2011-12	-0.1	0.1	44.3	30.9	0.597
<i>Wealth Inequality (HRP 65 and over):</i>					
2005-06	0.1	0.5	44.7	34.4	0.544
2011-12	0.1	0.4	39.4	27.1	0.511
	<i>Quintiles:</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Income Inequality^(a):</i>					
2005-06	8.1	12.9	17.5	23.2	38.3
2007-08	7.8	12.7	17.2	22.7	39.7
2011-12	8.1	13.1	17.5	23.1	38.2
<i>Wealth Inequality (total):</i>					
2005-06	1.3	6.2	12.1	20.2	60.2
2011-12	1.0	5.5	11.8	20.7	61.0
<i>Wealth Inequality (HRP under 65):</i>					
2005-06	1.2	6.1	12.0	20.4	60.2
2011-12	1.0	5.2	11.5	20.7	61.6
<i>Wealth Inequality (HRP 65 and over):</i>					
2005-06	2.8	8.4	12.2	18.1	58.5
2011-12	2.7	8.7	13.0	20.3	55.3

Note: ^(a) Based on the 2005-06 income measure.

Source: See Table 1.

How does the Australian experience income distribution since 2007-08 shown in Table 5 compare with that experienced in other OECD countries over the post-GFC period? Recent figures published by the OECD (OECD, 2014a: Annex Table) indicate that income inequality increased between 2007 and 2011 in just over half of the countries for which data are available and declined in the remainder, including Australia (although many of the changes were very small). Despite this, Australian income inequality remained above that in 22 of 30 OECD countries in 2011, its Gini coefficient being exceeded in only 8 countries: Chile, Israel, Mexico, Portugal, Spain, Turkey, the United Kingdom and the United States.

5. Summary and Conclusions

Concern over growing inequality has placed the issue at the centre of an economic debate that has for too long refused to engage with it, preferring instead to endorse (at least implicitly) the theory of ‘trickle down economics’, which sees increased inequality as a pre-condition for economic growth and growth as the solution to inequality. This view has been challenged by many prominent academic economists, including Joseph Stiglitz who refers (2010: xxiii) to ‘... the now widely accepted view that inequality is bad for the economy’. The OECD (2014b) has also noted that the old orthodoxy is now largely discredited, arguing that the recent increase in inequality has dragged down economic growth (by restricting the ability of those at the bottom to invest in their human capital and skills development and by lowering social mobility). It notes that:

‘While previous work by the OECD has clearly shown that the benefits of growth do not automatically trickle down across society, the new evidence closes the circle by suggesting that inequality also matters for growth. Policies that help to limit or reverse inequality may not only make societies less unfair, but also wealthier’ (OECD, 2014b: 3)

Reinforcing this view, the OECD Secretary-General has argued that:

‘... inequality has become a universal concern, among both policy makers and societies at large. ... Without a comprehensive strategy for inclusive growth, inequality will continue to rise. We need to put better policies for better lives at the centre of our policy efforts, while providing people with hope and equal opportunities’ (OECD, 2011: 17 and 19)

In the Australian context, Leigh (2013) has produced compelling evidence that although equality has long been a central feature of the Australian social and economic landscape, inequality has been growing in many dimensions over recent decades.

Growing economic inequality has been a feature of recent development in many countries and the evidence presented here shows that Australia has not been immune from this trend. Changes in how income is measured in the household surveys that form the basis of most studies of income distribution have made it harder to establish precisely what has been happening using consistent data covering the recent period, but the general picture that emerges is nonetheless clear and appears robust in the face of these changes. Factors that have contributed to the observed distributional changes include the failure to increase the real level of NSA for over two decades, reduced progressivity of the income tax system and the concessionary treatment of housing in the tax and transfer systems – although with the home ownership rate declining, it is unclear whether this factor will continue to play a similar equalising role among future generations.

There have been shifts in how both income and wealth are distributed that have benefitted those in the top quintiles of both distributions at the expense of those in the four quintiles below them. Critics may point out that, despite this, those who have not increased their share of income or wealth have still experienced an increase in their real absolute levels and are thus better-off. Such claims are being increasingly challenged by those who now challenge the proposition (implicit in ‘trickle down

economics') that increases in the real income or wealth of individuals automatically imply improved standards of living, irrespective of how they compare with how others are faring. There is a need to move beyond a narrow economic focus on living standards that emphasises the importance of material resources to a broader notion of well-being that encompasses notions of inclusion and equality in order that future economic gains do not compromise social goals.

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Who Cares and Does it Matter for the Labour Market?: A Longitudinal Analysis of the Labour Force Status of Indigenous and Non-Indigenous Carers

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Abstract

Indigenous Australians experience higher rates of severe or profound disability than other Australians and the gap in rates of disability between Indigenous and non-Indigenous Australians increases with age. The relatively high rates of disability amongst the Indigenous population lead to relatively heavy caring burdens. Relatively little is known about the impact of caring on the employment rates of Indigenous carers and virtually nothing about the impact of caring on changes in labour force status. This paper uses the recently released Australian Census Longitudinal Dataset to analyse the labour market dynamics of Indigenous and non-Indigenous carers and the extent to which these differ from the dynamics of those who are not carers. We also examine how labour force status changes, in association with commencement as a carer and exiting from caring. The analysis raises questions about how caring decisions are made within households and the extent to which the costs of caring may differ between Indigenous and non-Indigenous households.

JEL Codes: J13, J15, J22

Keywords: Carer, disability, labour force dynamics, Indigenous Australians

1. Introduction

Around 12 per cent of the Australian working age population, at any point in time, is providing unpaid informal care for a person who requires care because of a disability, long-term illness or old age. Unpaid carers are typically family members or friends and provide much of the care for people with a disability. The percentage of the population who will be unpaid carers at some point in their lifetime is considerably higher.

While there has been some Australian research into the impacts on carers of providing unpaid care, including on labour market outcomes, the existing research on carers is relatively limited, and for some groups such as Indigenous Australians there is very little research indeed.

This paper uses longitudinal data to estimate the impact of providing unpaid care for a person with a disability, long-term health condition or older age, on rates of paid employment of Indigenous and non-Indigenous Australians. Understanding the impact of caring on the paid employment of Indigenous Australians is important for several reasons. First, the proportion of the Indigenous population who require care is larger than for the Australian population as a whole and is projected to increase at a faster rate due to the impacts of the structural ageing of the Indigenous population. Because the Indigenous population is much younger, on average, than the non-Indigenous population, a larger proportion of Indigenous carers are of working age than are non-Indigenous carers. This means that understanding the impact of caring on the employment rate of Indigenous working age carers is important, particularly in the context of substantial policy attempts to increase the employment rate of the Indigenous population.

The provision of informal care has been found to have a negative impact on paid employment in a number of countries (e.g., Bittman, Hill and Thomson, 2007; Carmichael and Charles, 2003; Ettner, 1996, Gray and Edwards, 2009; Gray, Edwards and Zmijewski, 2008; Jenson and Jacobzone, 2000; and Leigh, 2010). The most convincing Australian estimates of the impact of informal care on paid employment are those of Leigh (2010), who finds that the provision of informal care reduces the probability of being in paid employment by 4-6 percentage points. An important point made by Leigh is that estimates of the impact of informal care on paid employment made using cross-sectional data substantially overstate the negative impact of caring on paid employment, primarily because carers had on average, lower rates of paid employment prior to commencing caring.¹ Such results can thus be very misleading.

There is very little research on the impact of informal care on the employment rates of Indigenous people and whether the impacts on employment for Indigenous and non-Indigenous carers are different, and virtually no longitudinal analysis. The one exception that we are aware of is Biddle and Crawford (2015) who found, using Australian longitudinal census data, that the provision of informal disability care was positively associated with acquiring a certificate-level qualification, with a larger effect among the Indigenous rather than the non-Indigenous population (after controlling for a small set of observable characteristics). Another relevant finding in the context of this paper is that Biddle and Crawford (2015) found there was a larger drop in the probability of becoming employed in 2011 (following a period outside the workforce) for Indigenous people who were carers in 2006 than for carers in the total population.

The linking of data from the 2011 Australian Census to a 5 per cent sample of the 2006 Census to create the Australian Census Longitudinal Dataset (ACL D) provides the opportunity to conduct the first ever longitudinal analysis of the labour market outcomes for Indigenous informal carers and the extent to which the impact of informal care on the Indigenous population differs from the impact on the non-Indigenous population. Census data also includes information on the provision of

¹ Using data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, Leigh (2010) finds that cross-sectional estimates indicate that being an informal carer reduces employment rates by between 20-28 percentage points.

childcare, which is important to distinguish from care for a person with a disability, long-term illness or who requires care because of old age (PWD for short). For the remainder of this paper we will refer to Childcare and Carer of PWD.

The remainder of this paper is structured as follows. The second section provides an overview of the ACLD data and the statistical methods used to estimate the impact of informal care on paid employment. The third section describes the labour force status of Indigenous carers and how this compares to non-Indigenous carers. The fourth section presents the results of the multivariate analysis of the impact of caring on labour force status. The final section concludes.

2. Data and empirical approach

2.1 Australian Census Longitudinal Dataset (ACLD)

The ACLD links a 5 per cent random sample of the 2006 Census with the 2011 Census using data linkage techniques.² The ACLD includes linked census data for 800,759 individuals of whom 14,802 identified as being Indigenous in 2006.³ This number represents substantially less than 5 per cent of the Indigenous population, but nonetheless forms the largest longitudinal dataset of Indigenous Australians (ABS, 2013). There were substantial changes in Indigenous identification between 2006 and 2011 among the linked sample. Of those who were identified as being Indigenous in 2006, 9.2 per cent were identified as being non-Indigenous in 2011 and 1.1 per cent had not-stated Indigenous status in 2011. Of those identified as being non-Indigenous in 2006, 0.2 per cent were identified as Indigenous in 2011 and 0.9 per cent did not state a response (ABS, 2013). The instability in the identification of Indigenous status presents a challenge for analysis and interpretation of the data, particularly when trying to compare changes over time from two cross-sectional datasets. One advantage of the ACLD is that the group of individuals (however defined) whose characteristics and outcomes are being compared over time can be held constant. In this paper we have defined Indigenous status as measured by the 2006 Census.

The analysis is restricted to the population aged 20-59 years in 2006 to ensure that all respondents were in the working aged population in both 2006 and 2011. The majority of the analysis is for the population 20-59 years in order to focus on the post-secondary school population. A separate analysis is reported for the population aged 15-19 years in 2006 according to whether they were full-time students in 2006.

The 2006 and 2011 censuses both include a question about whether each person in the household aged 15 and over provided unpaid care or assistance to family members or others because of disability, a long-term illness or problems related to old age. The question includes the instruction that recipients of Carer Allowance or Carer

² The two census datasets were linked drawing on information about personal characteristics only (i.e., not using name, address, or numerical record identifiers). Deterministic linkage (assigning record pairs across two datasets that match exactly or closely on common variables) and probabilistic linkage (overall agreement on a common set of variables, allowing linkage despite inconsistent or missing information) were used. For more information, see ABS (2013).

³ While the ACLD is a 5 per cent sample of the Australian population, the Indigenous sample is less than 5 per cent of the Indigenous population. The under-representation of the Indigenous sample in the ACLD is due to a lower rate of successful linkage for the Indigenous sample.

Payment should state that they provided unpaid care, and that unpaid help provided through a voluntary organisation or group should not be included. The question on the provision of unpaid care was the same in both censuses.

The strength of the ACLD for estimating the impact of informal care on the employment of Indigenous carers is that it includes a relatively large longitudinal sample of carers (with 68,300 carers in 2006, 78,000 in 2011, and 25,200 caring in both 2006 and 2011) and thus allows the impact of changes in carer status on paid employment to be estimated. The data source does however have several limitations. First, there is information for only two time points and this, combined with the fact that no information is provided on the start or end point of caring, means that it is not possible to analyse how labour force status of carers changes with duration of providing informal care. Second, it does not provide information on the intensity of care provided (e.g., number of hours), or the predictability of the caring requirements, which can be an important factor in determining the impact of caring on paid employment. The notion of a carer, according to the 2006 and 2011 censuses, covers people in a wide range of different circumstances, from those providing relatively few hours of assistance to someone with a mild disability living elsewhere, to those providing intensive, full-time care to a co-resident child or partner. Clearly, such variation in carers' circumstances is likely to have differential effects on labour force participation. However, beyond identifying carers, the censuses contain little information that can be used to distinguish between those with differing caring loads. Third, information is available five years apart and so the analysis of changes in labour force status relative to the timing of commencing or finishing caring is a little crude.

2.2. Empirical approach and statistical methods

The basic empirical approach is to estimate the probability of moving into or out of employment or not changing employment status between 2006 and 2011 according to carer status in 2006 and 2011. We first analyse differences in employment rates and changes in employment rates for various population groups identified in the ACLD data. The paper then provides some multivariate analysis of the probability of employment taking into account observable characteristics of the population.

This multivariate approach is operationalised by estimating regression models of the probability of being employed in 2011 for eight sub-populations defined according to caring status in 2006 and 2011 and employment status in 2006. Specifically, for those who were not employed in 2006, the key outcome variable is 'whether moved into employment by 2011'. For those who were employed in 2006, the key outcome variable is 'whether remained employed in 2011'. The basic empirical strategy is summarised in Table 1. The probability of being employed in 2011 is estimated using a logit model.

An alternative modelling strategy is to use the longitudinal nature of the ACLD data to take into account unobserved differences between individuals that may impact upon both their employment status and their likelihood of being an informal carer (i.e., unobserved heterogeneity). Two options are to estimate either a random effects or a fixed effects model. However, there is potential for bias in non-linear discrete choice

models when the number of time points is small.⁴ For this reason we chose to estimate the probability of employment using a cross-sectional logit model, but to use the longitudinal nature of the data to condition on caring and employment status in 2006.

The explanatory variables included in the regression modelling are gender, age (and age squared), educational attainment, whether the respondent has a disability, region of residence and provision of unpaid child care. These variables are consistent with the basic set of human capital, demographic and geographic controls used in previous census analyses of employment (Gray and Hunter, 2002).⁵ While the earlier census analyses controlled for education, age, gender, remoteness and some other socioeconomic characteristics, they did not control for carer and disability status, because such information was not collected at the time. The following analysis contributes to literature by focusing on such factors. Note that we consistently distinguish between the effect of childcare and providing care for a PWD.

The logistic regression models are estimated using maximum likelihood estimation techniques. When the explanatory variables are also categorical, the coefficients in a logistic model must be interpreted as relative to a reference person defined by the omitted categories of the respective groups of explanatory variables. The reference person, or base case in the following binary logistic regression analysis, is a non-Indigenous male without a disability who does not care for any children, has not completed education to year 12 and resides in a major urban area.

⁴ Since the regression models considered here are nonlinear, the least squares and feasible generalized least squares methods are not appropriate. This is more than an inconvenience in this setting, as it means that we need to consider some tricky specification issues when contemplating the extensions of the fixed and random effects models in the discrete choice modelling context.

The fixed effects model would be specified by the latent variable, emp_{it}^* :

$$emp_{it}^* = \alpha_i + x_{it}'\beta + z_i'\gamma + \varepsilon_{it}, t = 1, \dots, T, i = 1, \dots, n$$

where $emp_{it} = 1$ if $emp_{it}^* > 0$, and $emp_{it} = 0$ otherwise.

We have made the distinction between time varying attributes and characteristics, x_{it} , and time invariant characteristics, z_i . The common effects, α_i , may be correlated with the included variables, x_{it} . Since the model is nonlinear, the least squares estimator is unusable. The full maximum likelihood estimator for this model is inconsistent, a consequence of the incidental parameters problem. [See Lancaster (2000).] The problem arises because the number of parameters in the model, α_i , rises with n . With small T or T_i this produces a bias in the estimator of β that does not diminish with increase in n . The conditional log likelihood is the sum of the logs of the joint probabilities. Given the conditional log likelihood does not include fixed effects, the resulting estimator has the usual properties, including consistency (i.e., it bypasses the incidental parameter problem – see Willis 2006). However, it does have a major shortcoming in that by avoiding the estimation of the fixed effects we have precluded computation of the partial effects or estimates of the probabilities for the outcomes.

For the random effects model involving a binary choice, the underlying model is:

$$Emp_{it}^* = x_{it}'\beta + z_i'\gamma + \sigma_{uii} + \varepsilon_{it}, t = 1, \dots, T, i = 1, \dots, n,$$

where $E[u_i|x_{it}] = 0$ and $Var[u_i|x_{it}] = 1$ and, again, $emp_{it} = 1$ if $emp_{it}^* > 0$, and $emp_{it} = 0$ otherwise. That is, in random effects models the unobserved variables are assumed to be uncorrelated with (or, more strongly, statistically independent of) all the observed variables. In our opinion the observable random effects are likely to be correlated with the explanatory variables so the assumptions probably do not hold.

⁵ There are numerous studies of Indigenous employment, but Gray and Hunter was chosen as the example, because it used synthetic cohort analysis to try to get some insight into the longitudinal aspects of Indigenous labour force status by tracking cohorts across censuses. That is, prior to the ACLD, researchers had to construct artificial data to draw indirect conclusions about changes in Indigenous employment outcomes. Tracking individuals across time should facilitate more nuanced insights, especially if information is collected across future censuses for these individuals.

Table 1: Empirical approach to estimate employment transitions of carers controlling for carer status and change in carer status

<i>Model</i>	<i>Carer status in 2006 and 2011</i>	<i>Labour force status in 2006</i>	
Model 1	Carer of PWD in both censuses	Not employed	Probability of moving into employment by 2011 versus remaining not employed
Model 2		Employed	Probability of remaining employed in 2011 versus leaving employment by 2011
Model 3	Became a carer of PWD	Not employed	Probability of moving into employment by 2011 versus remaining not employed
Model 4		Employed	Probability of remaining employed in 2011 versus leaving employment by 2011
Model 5	Ceased being a carer of PWD	Not employed	Probability of moving into employment by 2011 versus remaining not employed
Model 6		Employed	Probability of remaining employed in 2011 versus leaving employment by 2011
Model 7	Not a carer of PWD in both censuses	Not employed	Probability of moving into employment by 2011 versus remaining not employed
Model 8		Employed	Probability of remaining employed in 2011 versus leaving employment by 2011

The estimation of separate regression models for the various sub-populations has the advantage that carer status is taken as given for each model. However, policy-makers are interested in comparing the prospect of employment for carers and non-carers. Arguably separate regression models complicate such comparisons because each model includes a different ‘scaling’ parameter. In order to facilitate such comparisons, a summary regression of the whole ACLD population is provided in the penultimate section. The summary regression is based on a larger sample and has relatively small standard errors. More importantly, it provides an estimate of the employment differences between various groups of carers. Note that the summary regression does not include employment status in 2006 as an explanatory variable because this would necessitate the move to a formal dynamic regression model that is beyond the scope of this paper (and is probably not sustainable given existing data).

3. Cross-sectional analysis of caring for a PWD and labour force status

According to the 2011 Census, the rate of caring for a PWD is slightly higher amongst the Indigenous working age population than among the non-Indigenous working age population. It is estimated that 19 per cent of Indigenous females were carers compared to 15 per cent of non-Indigenous females and 13 per cent of Indigenous males were carers compared to 10 per cent of non-Indigenous males (Table 2). It is evident that for both the Indigenous and non-Indigenous populations, males are less likely to be a carer than are females.

Table 2: Proportion of population who are carers for a person of PWD, 2011

	<i>Indigenous</i>		<i>Non-Indigenous</i>	
	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>
Proportion of population who are carers of PWD	19%	13%	15%	10%
Number of carers of PWD	24,514	14,051	913,511	547,606

Note: Population aged 20-64 years. These data exclude a small number of persons who did not state their labour force status.

Source: Tablebuilder 2011 Census.

Table 3 provides information on the labour force status in 2011 of carer status, gender and Indigenous status. Indigenous and non-Indigenous carers of PWD have a lower employment rate than those who are not carers. The employment rate of non-Indigenous female carers of PWD is 61 per cent and for those without caring responsibilities it is 71 per cent. For non-Indigenous male carers the employment rate is 75 per cent compared to 83 per cent for those without caring responsibilities.

Indigenous women with caring responsibilities have an employment rate of 41 per cent, lower than the employment rate of 48 per cent for those without caring responsibilities. Indigenous men with caring responsibilities have an employment rate of 51 per cent, compared to 60 per cent for those without caring responsibilities.

For all groups (Indigenous, non-Indigenous, male and female), the proportion of employment that is part-time is larger among carers than it is among those without caring responsibilities, although the differences are not dramatic. For all groups, carers are more likely to be not in the labour force compared to those without caring responsibilities.

Table 3: Labour force status by carer (PWD) status, gender and Indigenous status, 2011

	<i>Indigenous</i>		<i>Non-Indigenous</i>	
	<i>Carer for PWD</i>	<i>Not providing care for a PWD</i>	<i>Carer for a PWD</i>	<i>Not providing care for a PWD</i>
<i>Female</i>				
Total employed	41%	48%	61%	71%
<i>Employed, worked full-time</i>	21%	28%	29%	40%
<i>Employed, worked part-time</i>	20%	20%	32%	31%
Unemployed	9%	8%	4%	4%
Not in the labour force	50%	44%	35%	25%
Total	24,514	104,329	913,511	5,042,315
<i>Male</i>				
Total employed	41%	60%	75%	83%
<i>Employed, worked full-time</i>	37%	47%	61%	70%
<i>Employed, worked part-time</i>	14%	13%	14%	13%
Unemployed	14%	11%	5%	4%
Not in the labour force	35%	29%	20%	13%
Total	14,051	98,239	547,606	5,177,424

Notes: Population aged 20-64 years.

Source: Tablebuilder 2011 Census.

4. Longitudinal analysis of the relationship between caring for a PWD and employment

One way of estimating the impact of caring on rates of paid employment is to calculate the changes in employment rates that are associated with changes in caring status and how these compare to the employment changes for people who do not change their caring status.

Information is provided on employment rates in 2006 and 2011 for each of the four carer of PWD transitions: (i) carer of PWD in both 2006 and 2011; (ii) not a carer of PWD in 2006, carer of PWD in 2011 (transitioned into caring/became carers); (iii) carer of PWD in 2006, not a carer of PWD in 2011 (transition out of caring/ceased providing care); (iv) not a carer of PWD in both 2006 or 2011. The data is presented by Indigenous status and gender.

Employment rates in 2006 and 2011 are reported in Table 4 and changes in employment rates between 2006 and 2011 for each carer transition are reported in Figures 1-4.

Table 4: Employment rates in 2006 and 2011 by carer of PWD status in 2006 and 2011, by Indigenous status and gender

	<i>Indigenous</i>		<i>Non-Indigenous</i>	
	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>
	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
<i>Carer in 2006 and 2011</i>				
Employment rate 2006	45.6	49.1	59.7	76.1
Employment rate 2011	50.7	44.3	58.4	70.6
<i>Not a carer 2006, carer 2011</i>				
Employment rate 2006	48.4	66.7	68.8	84.1
Employment rate 2011	45.4	53.3	64.5	77.4
<i>Carer 2006, not a carer 2011</i>				
Employment rate 2006	50.6	68.5	63.2	79.7
Employment rate 2011	50.6	62.9	65.9	79.1
<i>Not a carer in 2006 or 2011</i>				
Employment rate 2006	50.9	68.4	72.4	86.4
Employment rate 2011	52.4	65.9	73.0	85.2

Notes: Population aged 20-59 years in 2006 and 25-64 years in 2011. Age range chosen to ensure that population of working age in both 2006 and 2011. Indigenous status according to what was reported on 2006 Census.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory

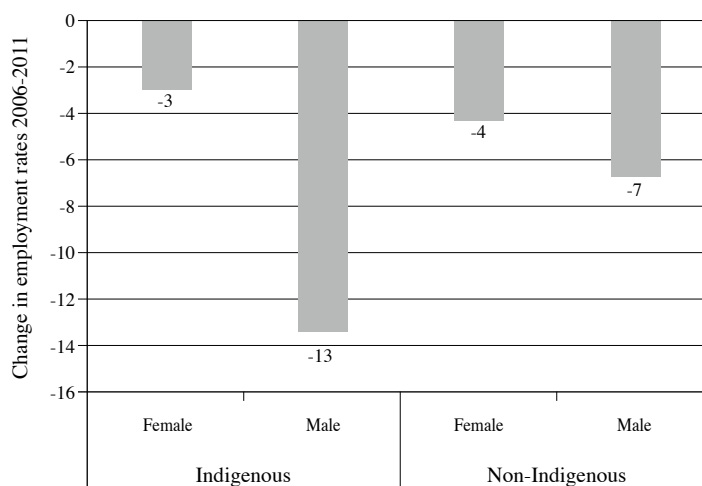
For those who were a carer in both 2006 and 2011 there was an increase in employment of 5 percentage points for Indigenous women but a decrease of 5 percentage points for Indigenous men. There was a small decline for non-Indigenous women (1 percentage point) and a substantial decline for non-Indigenous men (5 percentage points).

Those who became carers of PWD in 2011 have on average a lower employment rate prior to becoming a carer of PWD than do people who were not a carer of PWD in either 2006 or 2011. This is the case for Indigenous women and non-Indigenous women and men, although Indigenous men who became carers had a very similar employment rate to those without caring responsibilities.

For all groups examined there is also a decrease in employment rate associated with the commencement of caring by 2011. The decrease in employment rates associated with commencing caring was larger for men than women (Figure 1). For Indigenous men, there was a 13 percentage point decrease in employment rate and for non-Indigenous men the employment rate decreased by 7 percentage points. For women, the decrease in the employment rate following the commencement of caring was 3 percentage points for Indigenous and 4 percentage points for non-Indigenous.

This data suggests that the lower employment rates of carers is due in part to a lower pre-caring employment rate and in part due to a decrease in employment following the commencement of caring. As Leigh (2010) notes, some people may be able to take on a caring role because they are not in paid employment. This may include, for example, people who have already retired, or those who have young children and may be available to take on a caring for a PWD especially if it is less intensive. That is, part of the correlation of caring for PWD on employment rates is a selection effect and part of it appears to be due to the ‘impact’ of caring. The extent to which caring has a negative causal impact on the likelihood of being in paid employment is more effectively tested statistically using fixed effects models and the results are reported in Section 4.

Figure 1: Changes in employment rates between 2006 and 2011, people who became a carer of PWD between 2006 and 2011 (per cent)



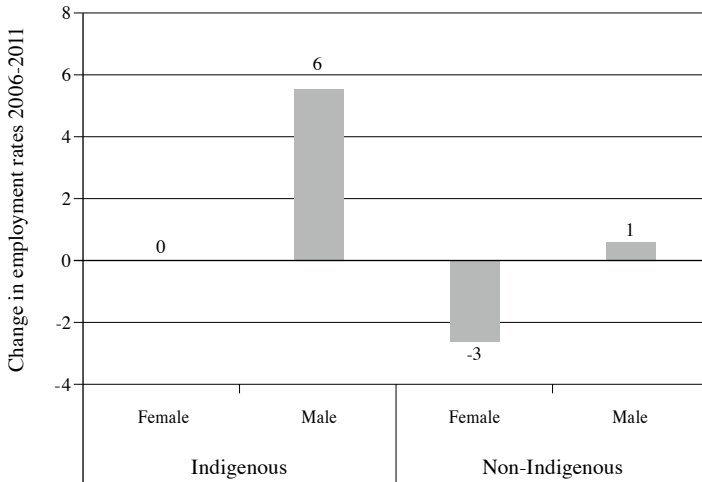
Notes: Population aged 20-59 years in 2006. Indigenous status according to what was reported on 2006 Census.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory. See Table 4.

The pattern in changes in employment rates between 2006 and 2011 for those who ceased providing care between 2006 and 2011 are less clear. For Indigenous women there was no change in average employment rates whereas for Indigenous men employment rates increased by 6 percentage points. For the non-Indigenous population there was a decline in employment rates for women of 3 percentage points and an increase for men of 1 percentage point (Figure 2).

For the majority of the population who were not a carer in either 2006 or 2011, there were small increases in employment rates for Indigenous and non-Indigenous women and a small decrease for non-Indigenous men. For Indigenous men there was a larger decline in employment rates of 3 percentage points.

Figure 2: Changes in employment rates between 2006 and 2011, people who ceased providing care for PWD between 2006 and 2011



Notes: Population aged 20-59 years in 2006. Indigenous status according to what was reported on 2006 Census.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory. See Table 4.

An alternative way of analysing the employment effect associated with caring for a PWD is to compare the employment transitions of those with and without caring responsibilities. Table 5 reports employment rates in the 2011 Census according to carer status in 2006 and 2011 and whether a person was employed in 2006. Irrespective of carer status, Indigeneity or gender, those who were employed in 2006 were more likely to be employed in 2011. Given that we condition on employment status in 2006, the employment probability can be read as a transition rate. For example if you were employed in 2006, the entry in the table provides an indication of the probability that you remained employed (measured in per cent). If you subtract this probability from 100, then the table entry provides information on the transition out of employment.

Similarly if you were not employed in 2006, then the employment probability for 2011 indicates the transition into employment between the last two censuses.

The first thing that is evident from Table 5 is that the probability of remaining in employment is lower for most Indigenous estimates compared to the analogous non-Indigenous estimates. The exception to this rule is Indigenous females who provided care at the last two censuses. They are not that different, in terms of transition probabilities, from the non-Indigenous females providing care in both 2006 and 2011 – indeed the probability of staying employed is actually slightly higher for Indigenous women (83 per cent, compared with 81 per cent of non-Indigenous women). Further evidence that this group of Indigenous female carers is not different from non-Indigenous female carers can be found in the fact that among those who are not employed in 2006, 24 per cent made the transition into employment by 2011 for both groups of female carers.

Table 5. Employment rates in 2011 by Indigenous status, gender, carer (PWD) status and employment status in 2006

	<i>Female</i>		<i>Male</i>	
	<i>Carer of PWD 2011</i>	<i>Not a carer of PWD 2011</i>	<i>Carer of PWD 2011</i>	<i>Not a carer of PWD 2011</i>
<i>Indigenous</i>				
<i>Carer of PWD 2006</i>				
Employed 2006	83	66	69	75
Not-employed 2006	24	35	21	36
<i>Not a carer of PWD 2006</i>				
Employed 2006	62	74	62	80
Not-employed 2006	29	30	36	36
<i>Non-Indigenous</i>				
<i>Carer PWD 2006</i>				
Employed 2006	81	83	86	88
Not-employed 2006	24	36	22	43
<i>Not a carer of PWD 2006</i>				
Employed 2006	79	85	85	91
Not-employed 2006	33	42	36	48

Notes: The population for this table is people aged 20-59 years in 2006.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory

For Indigenous males who provided care to PWD in both 2006 and 2011 the probability of remaining employed is 17 percentage points less than the analogous group of non-Indigenous male carers (69 per cent and 86 per cent respectively), but the transition into employment is only one percentage point less. To the extent that there is an employment impact from caring over the long run it appears to be associated with Indigenous males' capacity to remain employed while providing unpaid care

In order to discern the effect of providing care to a PWD on employment status, we need to compare the group who was not a carer in either census with the various categories of carers.

With one exception, the group who provide care over time tend to have a lower probability of remaining employed and a lower probability of entering employment between 2006 and 2011 than those who did not provide care at either point in time. For those who were employed in 2006, the differential between the 2011 employment rates for carers and non-carers tends to be less for the non-Indigenous population than the Indigenous population. Again the estimates for Indigenous female carers in both 2006 and 2011 are particularly noteworthy. The probability of remaining employed for Indigenous female carers is nine percentage points higher than for Indigenous females who did not provide care (83 per cent and 74 per cent respectively). However the probability of entering employment is substantially lower for this group of Indigenous female carers compared to non-carers (24 per cent and 30 per cent respectively). In our opinion, the relatively higher probability of remaining employed among this group of female Indigenous carers is probably due to better educational endowments and higher age.

5. Regression analysis of probability of employment

The estimates reported in the previous section of the associations between caring for a PWD and paid employment and the extent to which the associations differ between the Indigenous and non-Indigenous population does not take into account differences in demographic and human capital characteristics.

This section presents the results of estimates of the extent to which the changes in employment rates between 2006 and 2011 according to caring status in 2006 and 2011 differs between the Indigenous and non-Indigenous populations. As outlined in Section 2, separate models are estimating according to caring status in 2006 and 2011 and whether the individual was in paid employment in 2006. This allows estimation of the extent to which changes in paid employment status between 2006 and 2011 differs for the Indigenous and non-Indigenous populations.

The regression results are presented as marginal effects which are calculated as the change in the probability of employment in 2011 associated with a unit change in an explanatory variable (holding all other variables at their mean value).

Of the eight logistic models estimated, all either have an adequate ability to correctly predict outcomes within the sample or have a reasonably high concordance statistic.⁶ The coefficients estimated are consistent with the expectation from economic theory (see Hunter, Gray, and Crawford 2016: Appendix A2).

In order to illustrate the magnitude of the differences, Table 6 reports the marginal effect of explanatory variables on the probability of employment holding other variables at their average value. We now discuss in detail the findings for females to illustrate the interpretation of the marginal effects. The first row indicates that being female was associated with a significantly lower probability of employment in 2011 for most sub-populations (compared with males in the corresponding sub-populations), except for those who were carers for a PWD in both censuses and not employed in

⁶ Concordance statistics (i.e., C-stats) were estimated to provide an indication of the adequacy of the logistic models for prediction. The concordance statistic gives the percent of all possible pairs of cases in which the model assigns a higher probability to a correct case than to an incorrect case. Hosmer and Lemeshow (2000: 162) provide guidelines for interpreting the concordance statistic, which indicate that any statistic over the value of 0.7 is evidence that the model is adequate.

2006 (for whom the marginal effect was not significant). That is, the probability of being employed in 2011, among females who were not employed in 2006 and were carers for a PWD in both censuses, was not significantly different from that of their male counterparts. However, being female was associated with lower prospects of becoming employed than males among those who had not been a carer in one or both of these censuses (i.e., a marginal effect of between -7 and -10 percentage points). The marginal effect of being female on the probability of remaining employed between 2006 and 2011 is significant for all sub-populations irrespective of carer status for PWD in those two censuses, although the marginal effects are smaller than for those who became employed (between -4 and -6 percentage points). Note that the marginal effects for females are holding other explanatory factors constant, and therefore excludes the additional effect of childcare that itself tends to be associated with a significantly lower probability of employment (i.e., where it is significant at all in the regressions).

Increases in age and educational attainment are estimated to be associated with a higher rate of paid employment in 2011 for all eight models. Having a disability is associated with significantly lower employment rates in 2011.

Being Indigenous is estimated to reduce the probability of being employed in 2011, for those who became a carer for a PWD, those who ceased being a carer of a PWD and those who were not a carer of a PWD in both censuses. The estimated negative effect of being Indigenous on the probability of being employed is substantial. For those who were a carer for a PWD in both censuses there was no difference found between Indigenous and non-Indigenous.

Table 6: Marginal effects of explanatory variables on the probability of employment in 2011 (per cent)

	<i>Carer of PWD in both censuses</i>		<i>Became a carer PWD</i>		<i>Ceased being a carer of PWD</i>		<i>Not a carer of PWD in both censuses</i>	
	<i>Not-employed in 2006</i>	<i>Employed in 2006</i>	<i>Not-employed in 2006</i>	<i>Employed in 2006</i>	<i>Not-employed in 2006</i>	<i>Employed in 2006</i>	<i>Not-employed in 2006</i>	<i>Employed in 2006</i>
	%							
Female	1*	-4	-7	-6	-10	-5	-10	-6
Age	4	5	3	5	5	3	4	3
Age squared	0	0	0	0	0	0	0	0
Degree	28	7	26	9	28	6	29	4
Diploma	18	4	21	6	21	5	21	3
Certificate	20	4	18	5	20	4	22	2
Year 12 completed	4	3	8	2	4	2	8	0*
Disability	-15	-31	-25	-36	-32	-51	-38	-50
Indigenous	-4*	-1*	-7	-13	-8	-11	-14	-8
Regional area	3	1*	3	-1	3	0*	2	0
Remote area	9*	1*	7*	0*	11	1*	12	1
Childcare	2*	-3	-1*	-3	-7	-4	-7	-5

Note: The marginal effects are the change of the probability of employment in 2011 associated with a unit change in the explanatory variable holding all other variables at their mean values. The marginal effects that are marked with an asterisk are not significant at the 5% level using robust standard errors.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory.

Having a core disability is one of the strongest predictors of low employment rates, as is being female. While education tends to be the second largest factor associated with employment probabilities in 2011 there is significant variation in the returns to education in the various sub-populations. That is, the benefits of education can vary significantly among various sub-population groups after conditioning on carer status and employment status in 2006. Being a carer takes time and reduces the ability to find and secure work, irrespective of the level of your educational attainment.

We are confident that the results presented in Table 6 present a balanced and accurate estimates of the effect of explanatory variables on employment probabilities.⁷ While the regression analysis above conditions on employment status and carer status in the last two censuses, it involves estimation in eight sub-populations which entails a loss of efficiency and makes it rather difficult to summarise the overall findings. Table 7 provides a summary cross-sectional model of employment in 2011 using a basic logistic model.⁸

In broad terms, the marginal effects reported in Table 7 are consistent with that of the other regression analysis in this paper. In contrast to Table 6, the marginal effects presented in Table 7 do not use the information on employment status in 2006, but nonetheless demonstrate a significant negative correlation between providing care to a person with a disability and employment. For example, providing this form of care in both the 2006 and 2011 censuses is associated with a 9 percentage point lower employment prospect for both the Indigenous and non-Indigenous population relative to those who did not provide care in either of those censuses. Perhaps one issue is that becoming a carer of a PWD is associated with a somewhat high level of employment disadvantage in the Indigenous population. However, we also note that ceasing being a carer is not associated with any significant employment effect for the Indigenous population. Therefore the higher incidence of caring in the Indigenous population does not, on balance, appear to be a major source of employment disadvantage.

⁷ Section 2 discussed some of the limitations of standard panel data techniques in the context of discrete choice modelling when individuals are only observed at two points in time. Nonetheless, we estimated a fixed effects and random effects logistic model to use the more of the longitudinal information in the ACLD and in a tentative attempt to control for unobservable heterogeneity. These models also provide a robustness check for the logistic models reported above. Both the fixed effects and random effects estimates are statistically significant and consistent with the logistic estimates presented in this paper.

⁸ Given the issues for using panel data techniques identified above, we have not attempted to estimate a dynamic model that would attempt to directly control for an individual's employment status in 2006.

Table 7: Marginal effects of explanatory variables from summary model of employment in 2011

	<i>Indigenous</i>		<i>Non-Indigenous</i>	
	<i>Marginal Effect</i>	<i>Z-Statistic</i>	<i>Marginal Effect</i>	<i>Z-Statistic</i>
Female	-15%	-10.7	-12%	-89.6
Age	5%	9.0	4%	91.8
Age squared	0%	-8.9	0%	-100.9
Degree	34%	23.5	14%	103.2
Diploma	25%	13.7	10%	65.5
Certificate	25%	16.9	9%	64.2
Year 12 completed	14%	7.3	4%	24.1
Disability	-51%	-22.2	-62%	-130.6
Regional area	-6%	-3.5	0%	1.8*
Remote area	-10%	-4.8	6%	13.8
Childcare	-4%	-2.3	-7%	-45.7
Carer PWD in both 2006-11	-9%	-2.7	-9%	-25.5
Became Carer PWD	-10%	-4.1	-6%	-24.7
Ceased as Carer PWD	-2%	-0.8*	-4%	-14.3
Number of observations	5,356		395,157	
C-statistic	0.74		0.75	

Note: All models estimated for the population aged between 20 and 59 in 2006. Almost all marginal effects are significant at the 5 per cent level. The exception to this rule are those estimates with z-statistics that are marked with an asterisk. The reference person, or base case in the following binary logistic regression analysis, is a non-Indigenous male without a disability who does not care for any children, has not completed education to year 12, resides in a major urban area and does not provide care to a person with a disability in either 2006 or 2011.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory.

6. Labour market endowments of carers of PWD and employment transitions

The effect of care giving on labour market outcomes (and vice versa) can be conceptualised as a time allocation problem in which an individual has to allocate time across work, leisure and care-giving activities (Wolf and Soldo, 1994). Economic theory suggests that the caring will be done by the family members with the lowest value of their alternative time use.⁹ The argument is that the time cost of providing care may result in the potential for lost wages that diminishes family income and hence utility. This section considers this issue indirectly by considering the labour market endowments and employment transitions by carer (PWD) status.

Table 8 shows the means of a range of demographic and human capital variables according to Indigenous status and gender and whether a carer for a PWD in 2006 and 2011. The main pattern observed is that Indigenous people who provide care for a PWD in both 2006 and 2011 censuses tend to have a higher level of education than other groups classified by their carer (PWD) status. For example, over 13 per cent of Indigenous people who provided care for PWD in both censuses had a degree level

⁹ Within this model the value of alternative time use is the wage rate the person could earn in the market if employed and their likelihood of being able to find employment.

qualification, which was almost twice the prevalence of degrees among those who did not provide care in 2011 (of whom just over 7 per cent had degrees). Even among those Indigenous people who became carers between the 2006 and 2011 censuses, fewer than 9 per cent had a degree in 2011. The pattern is also evident for other post-school qualifications (Diplomas and even Certificates) with the Indigenous carers of PWD at the time of the last two censuses tending to be more educated than other Indigenous people. However, this pattern was not evident for the non-Indigenous population; for that population people who provided care for PWD in the previous two censuses were less likely to have a degree or certificate than other non-Indigenous groups. Notwithstanding, it is important to remember that Indigenous education outcomes are substantially less than all non-Indigenous groups in Table 8.

Table 8: Population weighted summary statistics for 2011 information by carer status (PWD)

2011 characteristics	Indigenous 2006				Non-Indigenous 2006			
	Carer of PWD in both 2006-11	Became carer PWD	Ceased being a carer PWD	Not a carer of PWD in both censuses	Carer PWD in both 2006-11	Became carer PWD	Ceased being a carer PWD	Not a carer of PWD in both censuses
Employed	0.472	0.462	0.491	0.542	0.518	0.601	0.580	0.671
Female	0.713	0.639	0.664	0.531	0.669	0.581	0.586	0.485
Age (years)	45	43	43	42	51	47	48	44
Age squared	2120	1917	1943	1857	2640	2306	2384	2047
Degree	0.133	0.085	0.073	0.071	0.221	0.236	0.225	0.232
Diploma	0.091	0.047	0.057	0.051	0.119	0.115	0.109	0.096
Certificate	0.196	0.191	0.184	0.185	0.169	0.195	0.182	0.200
Year 12 completed	0.090	0.140	0.144	0.154	0.133	0.153	0.149	0.178
Disability	0.065	0.053	0.081	0.069	0.048	0.044	0.060	0.053
Indigenous	0.964	0.953	0.956	0.953	0.003	0.003	0.002	0.002
Regional area	0.548	0.440	0.420	0.420	0.306	0.297	0.299	0.280
Remote area	0.140	0.255	0.256	0.230	0.011	0.012	0.016	0.019
Childcare	0.591	0.642	0.452	0.377	0.419	0.451	0.331	0.301
Estimated residential population	13,000	30,000	26,700	220,700	546,300	1,163,800	956,900	10,631,400

Note: The table population is people aged between 25 and 64 in 2011. Weights refer to the estimated residential population represented by the ACLD sample where all information was provided for both 2006 and 2011. This table presents means for variables measured at 2011 (except for Indigenous status that is held constant as that identified in 2006 and carer status which is allowed to vary between 2006 and 2011). Hence given that people may be identified as Indigenous at one census but not another, the average value for the indigenous variable does not necessarily equal zero or one. However, less than 5 per cent of Indigenous people have a different Indigenous status in 2006 and 2011.

Source: Author calculations based on ACLD 2006-2011 accessed through the ABS data laboratory.

These findings for the Indigenous are consistent with Biddle and Crawford (2015) who show that providing care to a PWD was associated with a higher probability of gaining an educational qualification. Biddle and Crawford speculate that the nature of care provided may be intermittent enough to allow for study (unlike child care, which may be more intensive).

The patterns in Indigenous educational outcomes by carer status appear to be inconsistent with the economic theories that suggest that care should be done by people with lowest value of their alternative time use. Within an Indigenous household, having a degree is relatively uncommon and those with a degree are more likely to be able to secure employment and be paid a high wage when employed. However the evidence for the non-Indigenous carers appears to be more consistent with the economic theory. We will return to this observation in the conclusion.

One reason for the high rates of education is that carers tend to be slightly older than non-carers. This may reflect the fact they are looking after an older partner or member of the household. Another salient observation in the context of this paper is that there is considerable correlation in the prevalence of care for a PWD and the provision of childcare.

7. Concluding remarks

There are several key findings that emerge from the analysis in this paper. First, over the short to medium term, providing unpaid care to a person with a disability is associated with substantially lower employment outcomes for Indigenous and non-Indigenous Australians and for men and women. Second, the impact of providing care on paid employment is greater for Indigenous men than it is for other groups (Indigenous women and non-Indigenous men and women). Third, Indigenous men who cease being a carer for a PWD experienced a substantial increase in employment, unlike other groups. Fourth, the impacts of caring on the probability of being in paid employment are negative but are relatively small for Indigenous women vis-à-vis non-Indigenous women. Fifth, the estimated effect of caring on the employment rates of non-Indigenous Australians is broadly consistent with the finding of Leigh (2010) who uses data from HILDA to estimate the impact of caring.

Indigenous Australians are more likely to be unpaid carers for a person with a disability than are non-Indigenous Australians and this caring has a particularly large negative impact upon the likelihood of being in paid employment of Indigenous men and is thus a significant factor underpinning the labour market disadvantage of Indigenous men.

There is evidence from the existing literature that for the Australian population as a whole, working age carers were less likely to be employed prior to commencing care than people who do not have caring responsibilities. There are likely to be a variety of reasons for this, including the economic argument that caring (where there is a choice) will be allocated to the family member with the lowest labour market opportunity cost and this will be strongly associated with educational attainment. However, for the Indigenous population, people who were either longer-term or recurrent carers (carers in both 2006 and 2011) had substantially higher levels of educational attainment than Indigenous people who were carers at one point in time only and those without caring responsibilities. For the non-Indigenous population there was no apparent relationship between educational attainment and caring. Elsewhere, analysis suggests that the rate of carer non-identification in the census may be higher among the Indigenous population than among the non-Indigenous populations, owing to culturally different perspectives on caring (Hill *et al.*, 2012). It may be that Indigenous people with higher

levels of education are more likely to be familiar with what Hill *et al.* (2012, p. 7) describe as the ‘formal Anglo-Australian connotations’ associated with the notion of being a carer, and therefore more likely to identify as carers.

We must ask ourselves why people with relatively good economic prospects will be more likely to provide care. It may be something as simple as they are the only household members in a position, or with the resources, to provide care. Whatever the reason for substantial numbers of educated Indigenous people providing longer-term care, it is important to acknowledge the reality in that it may circumscribe the capacity to close the gap in Indigenous and non-Indigenous employment.

Given the high level of disability and need for caring in the Indigenous community, it is desirable to have a substantial number of Indigenous people engage in caring (which is by definition a socially worthwhile endeavour). The tricky question for policymakers and researchers is whether some of these Indigenous carers would otherwise choose to be actively engaged in the labour market had they not been engaged in to provide care to person with a disability. The answer to such questions require analysis which can provide further insights into causal processes. Longitudinal data may provide one avenue for such research, but mixed method analysis that interrogates individual circumstances over a longer time period is likely to be required (or at the very least more observations over time). One of the major limitations of census data used in this paper is that it is difficult to understand the structural relationship between caring and employment without adequate information on income or wages that allow a more formal analysis of reservation wages and labour supply.

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