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## WHY WOMEN HAVE LOWER RETIREMENT SAVINGS: THE AUSTRALIAN CASE

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3 WHY WOMEN HAVE LOWER RETIREMENT SAVINGS: THE AUSTRALIAN CASE  
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78 *Jun Feng, Paul Gerrans, Carly Moulang, Noel Whiteside, and Maria Strydom*  
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1415 ABSTRACT  
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1920 This study provides empirical evidence of the gender gap in retirement savings trajectories using  
21 a large longitudinal Australian database. The persistent trend of retirement income policy over  
22 recent decades has been to place responsibility for retirement savings accumulation with the  
23 individual employee. These plans are fundamentally linked to employment conditions and  
24 individual choices, which shape retirement savings trajectories and outcomes. Australia has a  
25 mature compulsory system and thus provides insight for countries embarking on similar paths.  
26 This study shows that the gender gap in retirement savings is observable from early on in an  
27 individual's paid working life and persists over time, providing evidence that women are  
28 disadvantaged early in their careers, with few signs of improvement. Men, in contrast, are  
29 overrepresented in the upper quartile of growth in retirement savings. This study provides  
30 important empirical evidence for policymakers concerned with gender differences in retirement  
31 outcomes.  
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5051 KEYWORDS  
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## Gender inequality, pensions, social policy

JEL Codes: D14, D31, D63

## RUNNING HEAD: WHY WOMEN HAVE LOWER RETIREMENT SAVINGS

## INTRODUCTION

The financial consequences of retirement savings policies are different for men and women in terms of financial outcomes, and these differences are reflective of both explicit and implicit design features. A 2005 special issue in *Feminist Economics* on gender and aging focused, among other things, on the gendered differences in the economic resources available for retirement (Folbre, Shaw, and Stark 2005). The extent and nature of gender differences in retirement savings outcomes – that is, the gender pension gap or the “other” gender wage gap referred to as the “superannuation accumulation gap” (Jefferson and Preston 2005) – is the focus of this paper, and it appears that little has changed in terms of positive outcomes for women in the time since that special issue. Retirement savings trajectories – meaning, the pattern of accumulation – continue to differ for women in comparison to men. The aim of our study is to empirically examine the retirement savings gap as a consequence of labor market forces. Our analysis focuses on the gender differences in savings contributions profiles, which are linked to employment and the profile of interruptions of contributions resulting from the labor market.

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3 In doing so, we reveal and explain why women's savings persistently fall behind men's,  
4 with specific reference to different age cohorts, levels of income, and career trajectories. Our  
5 analysis is grounded in an empirical examination of Australian data where compulsory,  
6 employment-based retirement savings, known as superannuation, was made universal and  
7 mandatory in 1992. Employers must currently contribute 9.5 percent of salary (to rise to 12  
8 percent by 2025) for each employee earning over AU\$450 gross per month. With only a few  
9 exceptions, these contributions are paid to defined contribution (DC) schemes. Fiscal incentives  
10 encourage additional superannuation savings, which accrue disproportionately to those with  
11 higher incomes. Superannuation savings are "preserved" and can be accessed from age 60 tax  
12 free, once retired.<sup>1</sup> The superannuation system runs parallel with a tax-funded, means-tested,  
13 state-run age pension scheme from age 65.5 years, increasing to 67 years by 2023.  
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28 Most research on the issue of pension inequality relies on cross-sectional surveys, which  
29 offer repeated historical snapshots over time. This type of data has its limitations, particularly the  
30 inability to carefully follow specific cohorts over time. We employ data derived from a fund and  
31 use a large sample from a cross-section of Australian paid workers (21,499 members, 37 percent  
32 women) over a ten-year period, which allows individual age cohorts to be tracked over time to  
33 estimate cumulative effects on retirement savings. Our access to longitudinal data allows insight  
34 to what has changed over a ten-year period to build on the work of Therese Jefferson and Alison  
35 Preston (2005), who relied on projections to underpin their research, and the work of Sara  
36 Fernández-López et al. (2015), who documented gender differences in European retirement  
37 savings and advocated for longitudinal evidence. Our empirical results contribute to the growing  
38 interest in investigating the factors contributing to the gender gap in retirement savings  
39 (Australian Human Rights Commission [AHRC] 2016) and provide detailed longitudinal  
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3 evidence of how the retirement savings gap, which has been well-documented in a broad sense  
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5 (Senate Economics References Committee [SERC] 2016), is realized across age cohorts over  
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7 time as a consequence of the gender gap in the labor market.  
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10 Improved life expectancy and growing fiscal pressures have encouraged governments in  
11 developed economies to promote policies based on greater mutual obligation with funded private  
12 pensions to supplement state-run schemes. Rising public debt following the 2007 global financial  
13 crisis (GFC) has shored up official resistance to any increase in public liability for pensions and  
14 reinforced the move to DC schemes as a consequence. Here, retirement income is based on the  
15 amount saved on the individual's behalf (plus any interest earned) over a lifetime of paid work.  
16  
17 The growth of privately funded pensions in general, and DC schemes in particular, increases the  
18 importance of waged work as a basis for personal saving for retirement. Adoption of privately  
19 funded pensions tends to benefit higher earners (typically men) and disadvantage women  
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21 (Orenstein 2011). This creates problems as, while women's labor market participation rates have  
22 improved in recent decades, the gender participation gap in the labor market remains more than  
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24 10 percentage points in the United Kingdom, the European Union, and the United States and 12  
25 percent in Australia (OECD et al. 2014). In Australia, the "modified male breadwinner" model is  
26 said to dominate (Hill 2007), which describes households in Australia as continuing to position  
27 women as being primarily responsible for family-care roles in which women's income is  
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29 positioned second, or marginal, compared to male household earners (Broomhill and Sharp  
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31 20045; Hill 2007). Stay-at-home fathers (mothers), for example, comprise 4 (31) percent of two-  
32 parent families (Baxter 2017). Although aggregated statistics indicate that Australian women  
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34 have increased their economic participation (Greig et al. 2006), careful analysis of these statistics  
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36 indicate that this has resulted from increased participation by women in "part-time, low paid and  
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3 precarious jobs” (Barns and Preston 2010: 81). The nature of this type of employment can lead to  
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5 suboptimal outcomes, such as reduced promotional opportunities, employment insecurity, and  
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7 low superannuation accumulation. As future retirement income levels and distribution  
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9 increasingly depend on personal savings, which is in turn linked to wages, the gender gap in  
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11 retirement savings is expected to reflect past employment-based inequalities within the labor  
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13 market. The pension gender gap mirrors “cumulated disadvantages of a career spent in a gender-  
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15 biased labor market,” which “is even more true for older cohorts” (Bettio, Tinios, and Betti 2013:  
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17 7). While a gender-biased labor market evidently also shapes pension rights based on earnings-  
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19 linked social security (as found in the US, some Latin American countries, and many continental  
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21 European schemes), our principal focus here remains on personal funded pensions, specifically  
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23 compulsory, employment-based retirement savings.  
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29 In this context, the size of the gender gap in retirement savings, along with its dimensions  
30  
31 and trends, emerge as empirical questions. The retirement savings gap is a function of not only  
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33 the gender bias in the labor market but also gendered savings patterns (which again are labor  
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35 market influenced), education levels, and care obligations, which have been deemed “care  
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37 penalties” (Folbre 2017). The extent to which women save may mitigate the retirement savings  
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39 gap over time, but the ability to save and the amount saved may be reduced for those affected by  
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41 the gender pay gap in the labor market. US studies find that while the pay of low-skilled women  
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43 (those not completing high school) do not appear to fall further behind men following family  
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45 formation, the same is not true for highly skilled (college-educated) mothers (Anderson, Binder,  
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47 and Krause 2002, 2003). Issues of unwaged family care and its propensity to recast career  
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49 trajectories for middle-class women thus influence the size of pension gender gaps. Further,  
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51 recent trends toward equal labor market activity between men and women may prove permanent.  
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3 Recent US evidence shows that younger cohorts (18 years) display a greater affiliation to  
4 gendered working role models (male breadwinner, female domestic carer) than they did twenty  
5 years ago (Donnelly et al. 2016), thereby throwing into question the assumption that younger  
6 female cohorts will, in the future, continue to work for pay while raising a family. Lack of  
7 support for gender equality within the home has also been found cross-culturally in nations with  
8 more economic and educational opportunities for women, favoring more traditional attitudes  
9 within the home (Yu and Lee 2013). Discrepancies in labor market participation appear likely to  
10 continue, generating gender imbalances to undermine the political and economic viability of  
11 funded pension settlements. The ability to accommodate the issue of unwaged care attributed  
12 mainly to women is particularly central to the success of the transition toward funded old-age  
13 income security for all. While there is clearly complexity in the contributing factors that lead to a  
14 gender gap in retirement savings, the current study focuses specifically on the impact of the  
15 gender gap in the labor market.  
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## 38 THE LABOR MARKET AND THE GENDER PENSION GAP: AN INTERNATIONAL 39 PERSPECTIVE 40 41 42 43 44

45 Considerable academic research has been devoted to analyzing women's disadvantages in the  
46 labor market: disadvantages derived from occupational segregation in low-paid work, broken  
47 careers, and part-time jobs. The gender pay gap is also well documented (Weichselbaumer and  
48 Winter-Ebmer 2005; Morton et al. 2014; Blau and Kahn 2016; Olivetti and Petrongolo 2016). A  
49 generalization to pensions might appear to be a natural extension, but this topic has received  
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3 comparatively less attention – although some authors in the retirement savings literature have  
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5 pointed out how these gendered disadvantages coupled with household structures impact public  
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7 and private systems (Cebulla, Butt, and Lyon 2007; Clark and Strauss 2008; Meyer and Bridgen  
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9 2008; Van Dalen, Henkens, and Hershey 2010). The pension gender gap is evident and is often  
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11 larger than the gender pay gap. For the EU as a whole, the gender gap in pensions is more than  
12  
13 double the gender gap in pay (39 percent for pensions, 16 percent for pay; Bettio, Tinios, and  
14  
15 Betti 2013). Less consistent are the findings on the trend of gender-based pension gaps where  
16  
17 longitudinal analysis is conducted. Judith Flory (2012) estimates the gender pension gap to have  
18  
19 reduced from 69 percent in 1992 to 60 percent in 2007 in Germany, while the European  
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21 Commission (2013) identifies an overall widening of the gap in Europe between 2005 and 2010  
22  
23 of 1.7 percentage points, though this may fall within a margin of error and mask opposing trends  
24  
25 across countries. The mixed findings, however, partly reflect the retirement income measures  
26  
27 used (meaning, all retirement income versus DC-type personal savings only).  
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33         Reviewing the evolution of gender pension gaps over a thirty-year period in the US,  
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35 William E. Even and David A. Macpherson (2004) conclude that improved gender balance in the  
36  
37 labor market does not translate into gender equality in pensions. Tom Sefton, Maria Evandrou,  
38  
39 and Jane Falkingham (2011) analyzed family history impacts on current pension outcomes for  
40  
41 British retired women and suggest that previous employment is not a determining factor since  
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43 women's pension rights relied on the spouse or the state as previous low-paid and/or part-time  
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45 jobs did not offer any cover. Paid work linked to personal pension systems often increases the  
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47 penalty of caring: a conclusion that can be extended to all undertaking unwaged care (Evandrou  
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49 and Glaser 2003; Folbre 2017). Research tracking individual histories reveals the detrimental  
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51 consequences of missing contributions in DC schemes in the early years of pension saving.  
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3 Simulations show how a five- or six-year labor market absence to raise children creates a 17–25  
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5 percent drop in final DC savings (Rice Warner 2014; Scottish Widows 2015). This cannot be  
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7 compensated by extra “catch-up” contributions before retirement, as accumulated compound  
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9 interest on money put aside for prolonged periods is lost (Drew et al. 2014). In addition,  
10  
11 retirement planning is often viewed as a household (joint) decision, and women’s pension  
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13 expectations are statistically significantly lower than men’s (Van Dalen, Henkens, and Hershey  
14  
15 2010). Hence, private sector pension gaps are widest for married women, with strong  
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17 relationships between family size and pension outcomes (Parr, Ferris, and Mahuteau 2007); and  
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19 divorced older women are particularly vulnerable to old age poverty if they fail to secure a share  
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21 of their spouses’ pensions.  
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26 The “care penalty” (Folbre 2017) is central to any analysis of gendered pension gaps. In  
27  
28 reviewing over one hundred research publications on the pension consequences of unwaged care,  
29  
30 Therese Jefferson (2009) identifies three main policy strategies designed to protect women in  
31  
32 retirement. The first, promoting women’s full-time paid work, is characterized by the Nordic  
33  
34 countries. Earnings-related benefits, funded parental leave, tax-subsidized nursery daycare,  
35  
36 preschool classes, and after-school classes are available for younger children (Nyberg 2012). The  
37  
38 second strategy, providing a citizen’s pension to protect all elderly from poverty, is exemplified  
39  
40 by the Netherlands. A state pension is available to all fulfilling a residency qualification, but as  
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42 childcare is less available, Dutch women’s pensions are lower than their Danish equivalents due  
43  
44 to the strengthening of occupation-related pensions (Frericks, Maier, and de Graaf 2006). The  
45  
46 final strategy, sustaining a woman’s dependence on a male partner, is found in Germany under  
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48 state-run Pay As You Go (PAYG) social insurance (Ebbinghaus and Whiteside 2012). This  
49  
50 protects current German female retirees (Sefton, Evandrou, Falkingham, and Valchantonni 2011),  
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3 but recent pension reforms, reflecting a liberal turn, promote personal pension savings, as state  
4 protection is set to decline (Bridgen and Meyer 2014). Thus the Netherlands and Germany (and  
5 the UK) have the largest gender-derived pension gaps in the EU, while in the Nordic states, the  
6 problem is far less severe.  
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## 17 THE LABOR MARKET IN AUSTRALIA

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21 The retirement system in Australia increasingly relies on individuals to save toward their  
22 retirement, thereby placing less expectation and reliance on state-funded pensions. It relies on  
23 workforce participation and is closely linked to labor market conditions. It is an important case  
24 due to the length of time it has focused on DCs and can offer important insights into the success  
25 of this approach for designing a self-funded pension system. Compared to OECD countries,  
26 Australian women overwhelmingly work in part-time (mostly very short hours), precarious, and  
27 low-paid jobs (Barns and Preston 2010; Cobb-Clark 2012; OECD 2017). Recent legislation  
28 designed to reduce gender inequalities in Australia include the Workplace Gender Equality Act  
29 (2012), which imposed benchmarked obligations on employers with one hundred staff or more,  
30 and the Fair Work Act (2009), which introduced flexible paid working hours for parents of  
31 preschool children and paid parental leave (Broderick 2012).<sup>2</sup> Claims that superannuation  
32 perpetuates gendered labor market inequalities into retirement have been made (, Sheila Shaver  
33 2001; Susan Gee et al. 2002). An estimated gender earnings gap of 35 percent (Jefferson and  
34 Preston 2005) translates into a pension gap of 50 percent (Davis 2012 Clare 2014). The pension  
35 industry recommends the abolition of the lower minimum income hurdle for Superannuation  
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3 Guarantee contributions (currently set at AU\$450 per month from a single employer) to  
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5 accommodate more part-time or low-paid workers (Association of Superannuation Funds of  
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7 Australia [ASFA] 2014). Such marginal improvements, however, will not get to the heart of the  
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9 problem: women live longer and face retirement with lower retirement savings than men.  
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12 Different rates of men's and women's employment and underemployment are  
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14 contributing labor market factors in the gender gap in retirement savings. In 2001/02, some 78.1  
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16 percent of Australian men and 60.3 percent of women (ages 20–74) were employed. By 2011/12,  
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18 these averages had risen to 79.2 percent and 65.2 percent, respectively. Only 52.8 percent (76.3  
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20 percent) of women with dependent children below age 5 (ages 6–14) were employed in 2006/07,  
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22 compared to 94 percent (92 percent) of men. Fathers of dependent children are both more likely  
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24 to work for pay and to work for pay full time compared to their partners. Notwithstanding the  
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26 increase in employment rates of mothers over the past thirty years,<sup>3</sup> mothers remain the primary  
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28 childcare giver and many leave the labor force for extended periods, reducing their  
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30 superannuation savings in an economically significant way. Similarly, informal care (for  
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32 example, caring for a disabled spouse or adult relative) disproportionately falls on women, with  
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34 financial and well-being consequences (van den Berg, Fiebig, and Hall 2014). Over and above  
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36 total labor market absences, more women than men work for pay part time and consistently  
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38 represent a greater share of underemployed workers (the underutilization of the productive  
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40 capacity of the employed population). In 2001/02 (2011/12) 42.4 percent (43.2 percent) of  
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42 women in the labor force were employed part time, compared to 11.1 percent (13.5 percent) of  
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44 men. This gender difference interacts with the mandatory contributions rate, as it is only required  
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46 if an individual earns more than AU\$450 per month from the employer. Thus individuals who  
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48 work for pay on a casual or part-time basis with multiple employers, the majority of which are  
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3 women, may not receive contributions even if they earn more than AU\$450 per month in  
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5 aggregate.  
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8 This employment pattern is reflected in figures on men's and women's average paid  
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10 working hours. Women work for pay fewer hours than men, whether employed full or part time,  
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12 although the gap for full-time paid workers is more notable. The Australian Bureau of Statistics  
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14 (ABS; 2016) 2015 data confirm that, on average, men work for pay 5 hours longer per week than  
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16 women. For part-time paid workers these figures are 17.2 (17.3) hours for men versus 16.4 (16.8)  
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18 hours for women. These disparities, unsurprisingly, increase for parents of dependent children.  
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20 The father of a preschool child working for pay full time (part time) averages 41.1 (18.6) hours  
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22 per week compared to 32.3 (15.1) hours for mothers. Within both categories, therefore, longer  
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24 hours probably translate into higher earnings (and retirement savings) for men than for women –  
25  
26 thus creating future gaps in retirement balances. Cohort effects are evident in prior studies that  
27  
28 have examined changes in Australian women's labor market participation (Austen and Seymour  
29  
30 2006), with increased participation with successive generations of women. Therefore, when  
31  
32 documenting gender differences in retirement savings, it makes sense to also consider  
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34 differences between age cohorts.  
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40 A clear gender-based pay gap adds to the gender gap in retirement savings. Excluding  
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42 managerial grades, the average hourly rate for men was AU\$35.40 in 2012,<sup>4</sup> compared to  
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44 AU\$31.20 for women. Accumulation rates for women, therefore, fall behind those for men. In  
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46 2011/12, the average superannuation balance for men (age 15 and older) was AU\$197,000 as  
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48 compared to AU\$105,000 for women (Clare 2014). This difference grows with age: the gender-  
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50 based balance gap in the 25–34 years age group (AU\$25,859 for men versus AU\$18,082 for  
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52 women) increases in the retirement age group, aged 65–74 (AU\$153,779 for men versus  
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3 AUS\$77,653 for women). Furthermore, some 34.6 percent of women aged over 15 years had no  
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AUS\$77,653 for women). Furthermore, some 34.6 percent of women aged over 15 years had no superannuation coverage in 2011/12, compared to 26.1 percent of men (Clare 2014). Younger (ages 15–24) and older (ages 65 and older) women were most likely to have no superannuation coverage. For younger women, this likely stems from participation in casual paid work, which often does not create sufficient income to attract Superannuation Guarantee payments. For older women, the legacy effect of part-time employment in the period prior to the Superannuation Guarantee, introduced in 1992, explains their lack of superannuation savings.

In summary, the situation in Australia bears marked similarities in regard to the low rates of retirement savings for women found elsewhere. Gender-based differences in labor force participation and the presence of dependent children affect women's participation in waged work more than men's. Women are also substantially more likely to be employed part-time and the number of hours employed, whether on a full- or part-time contract, is also lower for women in every age cohort. The current wage gap not only impacts women's current spending abilities, but also their long-term consumption abilities due to the resulting retirement savings gap. While unemployment rates for men and women are similar, the underutilization rates for women are higher. Excluding professional classes, women receive lower hourly and weekly pay in each age cohort. While the associated impact on gender retirement savings is relatively small for cohorts in their early 20s, this gap is much larger (and very material) later in life.

#### AUSTRALIAN RETIREMENT SAVINGS DATA

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2  
3 This paper uses administrative data from Mercer Australia to examine superannuation (pension)  
4 accumulation trends, tracking specific birth cohorts from 2002/03 to 2011/12. In 2012, the  
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6 Mercer Super Trust (MST) had 260 participating employers and AU\$15 billion in assets under  
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8 management, making it one of the largest funds in the retail/corporate plan sector. The data cover  
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10 employees drawn from a broad section of employers and offer a longitudinal perspective on  
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12 patterns of superannuation accrual, allowing for a gender comparison over time. The transaction-  
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14 level data facilitate further analysis of gender differences by exploring birth cohorts' contribution  
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16 behaviors.  
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21 Before proceeding to the analysis, we highlight some features of the data. First,  
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23 information about members is limited to factors of direct concern to the management of the  
24  
25 superannuation fund. While distinguishing fund members by age and gender, there is no  
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27 information on marital status, parenthood, occupation, or savings outside superannuation. Annual  
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29 income is proxied by the dollar amount of an employer's contribution. In the context of the  
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31 Australian system, this is a good proxy because the Superannuation Guarantee Act (SGA)  
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33 mandates employers' contributions at a fixed proportion of an employee's earnings. Equally, a  
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35 temporary absence from paid work, or a transfer to part-time paid work, can be deduced from  
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37 changes in regularity or amount of contributions made on a member's behalf. Members who  
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39 cease employment can also be identified, as they are transferred into a separate personal division  
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41 of the MST. Second, the analysis below focuses primarily on the experiences of different birth  
42  
43 cohorts by gender. However, as mandatory superannuation was only introduced in 1992, this has  
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45 implications for the balance of older women in the early years of the sample, as they were less  
46  
47 likely to have been covered before that date (due to part-time paid work, for example). The  
48  
49 system achieved a level of maturity in 2002/03, when mandatory contribution rates reached nine  
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3 percent and remain so for the remainder of the data period to 2011/12. Therefore, while the  
4  
5 superannuation system has not fully matured, the period allows an analysis of early implications.  
6  
7 Finally, the data presents an unbalanced panel with employees entering and leaving and with  
8  
9 employers who also enter, and less commonly leave, the MST over the period. To reduce the  
10  
11 influence of new members, this study restricts analysis to those who were in, or joined, the fund  
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13 in 2002/03.  
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17 A breakdown of the sample suggests a close match to population employment statistics in  
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19 terms of the location and industry from which members are drawn. For example, comparing the  
20  
21 2003 ABS (2003) employment data for a state breakdown versus the sample: New South Wales  
22  
23 (NSW; 35 percent sample, 33 percent population); Victoria (28 percent, 25 percent); Queensland  
24  
25 (13 percent, 19 percent); Western Australia (WA; 11 percent, 10 percent); South Australia (SA; 8  
26  
27 percent, 8 percent). In terms of the industry breakdown, a less complete comparison is available.  
28  
29 We compared employers within the MST where industry was available and compared with ABS  
30  
31 data. Again, the data identifies the general comparability of the sample with the broader  
32  
33 population. For example, comparing the 2003 industry breakdown (ABS 2004) of employed  
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35 persons for the 25–34 and 35–44 years age groups: services (including financial; 29 percent of  
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37 the sample, 35 percent of the population); transportation (4 percent, 5 percent); retail trade (20  
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39 percent, 11 percent); and agricultural and mining (5 percent, 4 percent).  
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#### 49 COHORT SIZE AND ATTRITION

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3 Given the consistently observed gender gap in savings at retirement, we are interested to trace  
4 how the differences emerge. In addition, we attempt to explore how the level and pattern of  
5 retirement savings contributions lead to this gap, as several channels are possible. First, there is a  
6 wide gender wage gap in Australia, and since contributions are tied to wages, women save less.  
7  
8 Second, women often reduce paid work (for example, switching to part-time paid work or taking  
9 a career break) to meet caring needs, such as raising children, and make no retirement savings  
10 during this period. To explore these factors, we structure the analysis by examining three three-  
11 year birth cohorts of members who were in the MST at the end of 2002/03: those ages 24–26  
12 years in the 2002/03 financial year (born in 1976–78), those 34–36 years (born in 1966–68), and  
13 those 44–46 years (born in 1956–58). Over the ten-year analysis, childcare needs would be  
14 substantially increased for women in the youngest cohort, reduced for women in the middle  
15 cohort, and stabilized for women in the eldest cohort.

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31 Figure 1 provides a breakdown of the initial sample of 21,499 members by gender, birth  
32 cohort, and financial year. There are more male members in each birth cohort, with the elder  
33 cohorts substantially so, reflecting gender differences in labor participation at older ages.  
34  
35 Attrition, as it relates to this study, refers to an exit from the fund, not the labor market. The  
36 attrition in the sample is high, with only 6,669 members remaining in MST by the end of the ten-  
37 year window. Among the birth cohorts, the youngest cohort has the highest attrition rate,  
38 indicating greater labor mobility. For each birth cohort in the sample, the propensity for women  
39 to leave the MST is higher than that for men.

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49 <Insert Figure 1 >

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51 High attrition rates pose an issue for our analysis if they are substantially different by  
52 gender. Members may switch jobs due to low current salary levels, and we investigate if the  
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3 proportion of women in low-contribution quartiles changes over time. Panel A of Figure 2 shows  
4 the proportion of women in each of the contribution quartiles in each financial year. A member is  
5 classified into a contribution quartile within her own birth cohort based on the first observed full  
6 financial year of contributions.<sup>5</sup> Among all birth cohorts, the proportion of women in the  
7 majority of contribution quartiles is stable over time, suggesting that women are not  
8 underrepresented in later observation periods. Another factor that could differentially impact  
9 attrition is wealth, where, similarly, low-wealth individuals may be more likely to switch jobs.  
10 Similar to contributions, Panel B indicates that member attrition is not biased toward a particular  
11 gender over the ten-year period. As a further robustness check, a balanced sample was also used  
12 to investigate the research question. The results are similar; hence, results from the unbalanced  
13 sample are reported here.

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## 35 RETIREMENT SAVINGS ACCUMULATION AND DISTRIBUTIONS

### 36 37 38 39 40 **Balance distribution between genders** 41 42 43

44 All three cohorts had substantial growth in account balances over the ten-year period. The  
45 youngest birth cohort, coming from a low-balance base, had the highest growth of almost 750  
46 percent in median balances, jumping from AU\$7,527 to AU\$56,415. The oldest birth cohort,  
47 starting from a substantially higher balance of AU\$67,324, had their median balance tripled to  
48 AU\$202,681. The gender balance gap exists from very early on and continues over time. The  
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3 youngest cohort had a gap of AU\$1,142 in 2002/03 (AU\$5,674 versus AU\$6,816), while the  
4  
5 oldest had a gap of AU\$21,889 (AU\$20,184 versus AU\$42,073). At the same time, men's  
6  
7 balances had higher growth than women's, broadening the gap for the youngest cohort to  
8  
9 AU\$18,608 (AU\$43,158 versus AU\$61,766) and AU\$81,769 (AU\$90,266 versus AU\$171,995)  
10  
11 for the oldest in 2011/12. The changes are a result of the combined effect from contributions to  
12  
13 the superannuation, investment returns, and taxes and fees charged. Jun Feng and Paul Gerrans  
14  
15 (2014) have shown that the majority of superannuation members rely on the default contribution  
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17 level and investment option. Therefore, employer contributions to superannuation will drive  
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19 gender gaps in balances.  
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24 Figure 3 details the gender balance gap for each birth cohort separately for each  
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26 contribution quartile. Overall, the gender balance gap increases over time for all birth cohorts  
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28 and contribution quartiles. Young members (24–26 years and 34–36 years cohorts) in the lower  
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30 contribution quartiles had modest gender differences initially, which widen slightly over the  
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32 period. Older members (44–46 years cohort) had a sizable gap at the beginning of the period,  
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34 which continued to widen over time. Thus, the gender balance gap increased statistically  
35  
36 significantly. Members in the highest contribution quartile exhibit the largest gender balance gap.  
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38 Further t-tests suggest that for lower contribution quartiles, only the oldest cohort had a  
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40 significant balance difference from the very beginning, with the middle and younger cohorts not  
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42 having statistically significant differences until five years later. Meanwhile, disparity existed for  
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44 all cohorts in the highest contribution quartile from 2002/03 and continued through the  
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46 observation period.  
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51 <Insert Figure 3>  
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3 Over the ten-year period, the gender balance gap reduced during 2007/08 to 2009/10,  
4 reflecting the impact of external events, namely the GFC. Notably, in the oldest cohort, a  
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6 narrowing of the gender balance gap was observed, in part, reflecting that those with larger  
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8 balances fared relatively worse in the GFC. Sarah Holden et al. (2013) have shown that for  
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10 younger 401(k) account holders with smaller balances, annual contributions dominated balance  
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12 declines experienced through the GFC. In contrast, for older account holders with larger balances,  
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14 their annual contributions were unable to recover their account declines. An analysis of labor  
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16 market data also suggests a differential impact as the unemployment rate increased from 3.7 (3.6)  
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18 percent for men (women) in August 2008 to 6.1 (6.0) percent in June 2009 (ABS 2016). Finally,  
19  
20 a comparison of men that exited the MST in 2008/09 reveals they had lower mean balances than  
21  
22 their female counterparts, suggesting it was lower (higher) income men (women) that were laid  
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24 off at this time.  
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31 A few extremely high balances can skew average balances. Therefore, we further  
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33 examine the whole distribution of balances and formally test differences in balance distributions  
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35 by gender. Figure 4 presents the comparison between birth cohorts from 2002/03 (adjusted to  
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37 equivalent 2011/12 values) with themselves in 2011/12. A Kolmogorov-Smirnov test confirms  
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39 differences in the balance distributions, with men having higher accumulations than women,  
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41 although the balance density for women coheres at higher levels among older birth cohorts. In  
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43 other words, the distribution of women's balances for every birth cohort is lower (with more  
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45 density to the left reflecting lower balances). The difference is most obvious for the 44–46 years  
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47 cohort. Repeating the comparison for the surviving (non-exited) members in 2011/12 shows that  
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49 the differences in distributions are larger in 2011/12 than in 2002/03.  
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### Balance inequality

The analysis so far has concentrated on distributional outcomes to shed light on the unequal accumulations in superannuation savings. To further explore the distributional differences in superannuation savings, we explore a number of inequality measures to provide a picture of differences both within and between genders, as well as from a single time point and taking into account the time structure.

The first inequality measure used is the Gini index (Paglin 1975; Deininger and Squire 1996), which ranks the distribution of balances, or contributions, and compares the cumulative proportion of total sums with the cumulative proportion of the number of members. If 10 percent of the members own 10 percent of the total balance, there would be an equal distribution. Here the measure is used to examine within the genders to see if the distribution is more or less equally distributed. Panel A of Figure 5 shows the Gini index for each cohort over years. Of most interest is the relative position of each gender and the relative inequality between birth cohorts. The figure suggests that there is an overall reduction in wealth inequality within gender over the period, albeit the youngest cohort saw an increase in inequality in later years. In most of the years, wealth inequality is slightly higher among women; however, this difference is overwhelmed by differences across birth cohorts. Wealth inequality is the greatest among the oldest cohort and lowest among the youngest, indicating a cumulative effect where inequality worsens as one ages.

<Insert Figure 5>

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3 The cross-section snapshot of inequality by year according to the Gini index can be  
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5 overly influenced by wealth in a particular year. The worsening of wealth inequality  
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7 accompanied by aging can be a result of rich people getting richer and poor people getting poorer  
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9 without changing their relative position in a distribution. Therefore, we also utilize a mobility  
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11 index to measure movements in distributions to examine how likely a member will move up or  
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13 down the wealth distribution. Anthony F. Shorrocks's (1978) R mobility measure with the Gini  
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15 index is used to quantify the proportion of inequality measured over a sub-period – here,  
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17 annually – which persists over the longer-term period. The index ranges from 0 to 1, with 0  
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19 indicating no mobility or rigid inequality. Figure 6 presents the mobility index for wealth and  
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21 contributions over the observation period. Each of the data points represents the mobility index  
22  
23 estimate of a balanced sample of survivors remaining in MST at the end of the financial year.

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28 Panel A of Figure 6 shows the mobility index for wealth distribution. The higher the  
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30 value, the greater the mobility. Consistent with the Gini index, there is an increasing mobility  
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32 trend over time. Mobility is greatest for the youngest cohort, reflecting greater movement up and  
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34 down the balance distribution. Also, mobility is generally greater for women, though this is  
35  
36 relative to other women within the birth cohort. Note that the largest gender gap is evident for the  
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38 youngest birth cohort, reflecting a high degree of volatility in the distribution of their  
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40 superannuation balances, which is reduced for the 34–36 years cohort and nearly disappears for  
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42 the oldest cohort.  
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47 <Insert Figure 6>  
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49 The within-gender analysis allowed us to examine the dynamics among members of the  
50  
51 same gender. We now seek to identify inequality between genders by investigating whether  
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53 female (male) members are overrepresented in the lower or upper sections of wealth distribution.  
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3 To do so, all members are pooled, sorted, and ranked by member balance at the end of each  
4 financial year. Next, we assign each member a percentile ranking from 1 to 100, where a ranking  
5 of 1 (100) represents a balance in the bottom (top) 1 percentile of all members. To examine the  
6 relative position of female and male members, we then sum the percentiles separately and  
7 calculate the average percentile. Finally, the ratio of female average percentile to male average  
8 percentile is estimated: the closer this value is to 1, the closer the average percentile ranking of  
9 men and women. Both the level and trend in this ratio are of interest.  
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19 The trend revealed in Panel A of Figure 7 suggests that the average ranking decreases for  
20 female members relative to male members for each birth cohort. The average ranking is closest  
21 to a value of 1 (where male and female balance percentile rankings are almost equal) for the  
22 youngest cohort and furthest apart for the oldest. The dip and subsequent improvement in female  
23 to male percentile balance rank for the 44–46 cohort in 2010/11 and 2011/12 corresponds to the  
24 exit of a group of relatively higher balance women in 2010/11.  
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## 38 LABOR FORCE FACTORS AS A CONTRIBUTOR TO GENDER RETIREMENT SAVINGS

### 39 40 GAP

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44 In what follows, we undertake an analysis to investigate whether gender-based differences in  
45 labor market conditions are observed within the MST data. We make use of the fact that because  
46 the mandatory employer contributions for paid workers are a fixed percentage of wages in  
47 Australia, they provide an excellent proxy for earnings.  
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## Wage gap and inequality

The previous discussion of Panel A in Figure 2 showed that men are overrepresented in the two highest contributions quartiles for each birth cohort. The distribution is least dispersed in the youngest cohort and most dispersed for the oldest cohort. Given that a large proportion of men receive higher contributions and from younger ages, the power of compounding is expected to magnify into larger balance differences over time.

Mobility in earnings, despite being greater than in wealth (Headey, Marks, and Wooden 2005), is limited. Inequality in contributions when measured within gender (Panel B, Figure 5) is generally smaller than in wealth. The Gini index for contributions/earnings is relatively stable for all cohorts except the youngest group of women. Similar to the pattern for wealth distribution, the mobility index suggests that it is those within the youngest cohorts who are more likely to move up and down the earnings distribution (Panel B, Figure 6). Average women's contributions/earnings are always lower than men's in the data – female member rankings, on average, are lower than male rankings for all cohorts, as shown in Panel B of Figure 7. While the disparity in earnings is relatively stable in the older cohorts, for the youngest cohort, there is a sharp increase in the disparity of earnings. This persistence in the earnings/contributions gap feeds into the retirement savings gap.

<Insert Figure 7>

## Labor force interruptions



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5 In addition to differences in earnings levels, labor force interruptions also play a role. As noted,  
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7 women are predominantly the caregivers, whether for children, a spouse, or adult family  
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9 members, necessitating time off from paid work in the form of reduced paid working hours or  
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11 not working for pay for a period of time. We consider a number of definitions for labor force  
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13 interruptions as they manifest in contributions records. First, we identify instances of a reduction  
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15 in the level of employer contributions as a proxy for changes in the number of hours worked for  
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17 pay. Second, we analyze instances of a reduction in the number of employer contributions made  
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19 in a year as a proxy for changes in employment patterns. Absence from paid work, or switching  
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21 to casual paid work, can lead to a reduction in contribution frequencies. Third, we identify those  
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23 members who remain employed but do not receive any employer contributions for a financial  
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25 year as a final measure of employment interruption. The three panels of Figure 8 present these.  
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31 Panel A indicates that prior to the GFC, women in the two youngest cohorts were more  
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33 likely to have interruptions, indicated by a reduction in mean contributions. The difference is not  
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35 observed for the 44–46 years cohort. This pattern coincides with data that indicates that the late  
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37 20s and early 30s are the most common age for becoming a mother in Australia (Australian  
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39 Institute of Family Studies 2018). Panel B indicates a similar pattern, though more evident for  
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41 the 24–26 years cohort. The pattern of a higher proportion of female members having a reduction  
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43 in the frequency of contributions extends to the mid 30s but is again not evident in the 44–46  
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45 years cohort. Panel C indicates that a rising trend over the period is observed for those missing a  
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47 full year of contributions. This parallels the overall attrition rates, but whereas attrition is based  
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49 on members being classified as exited, here members remain in the fund (and with the employer)  
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51 but are absent a full year. It is likely that these members transition to being an exited member.  
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3 Again, the proportion is consistently higher for female members, though the differences for the  
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5 oldest cohort are not apparent until post-GFC.  
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8 <Insert Figure 8>  
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## 10 11 12 13 14 15 FUTURE OUTLOOK ON THE GENDER BALANCE GAP: COMPARING AGE COHORTS 16

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19 Patterns discovered through the birth-cohort analysis prompt the question of whether the pattern  
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21 holds for other birth cohorts. We start with an investigation into the distribution of wealth for  
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23 members of the same age at two different points in time. Panel A of Figure 9 compares the  
24  
25 experience for two of the age cohorts: those 24–26 years and 44–46 years in 2002/03 compared  
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27 with their same-age peers in 2011/12. For the youngest age cohort, for both men and women,  
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29 inflation adjusted balances are marginally lower in 2011/12 than for their 2002/03 counterparts.  
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33 In real terms, they appear worse off, possibly reflecting GFC impacts on earnings and paid work  
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35 opportunities of the young. For the 44–46 years age groups, the 2011/12 cohort are better off  
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37 than their same-age group a decade earlier. Despite this, the gap between men and women  
38  
39 remains. Panel B of Figure 9 suggests that there is a small improvement in gender balance  
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41 inequality for each age cohort. The average percentile ranking for women's balance improves  
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43 marginally relative to men over the period, although more so for the older cohorts.  
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47 Notwithstanding, inequality remains, with men's rankings, on average, higher than female  
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49 member rankings for each of the cohorts. In terms of contributions, a similar level of gender  
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51 inequality is persistent for all three age cohorts. The comparisons in Panel B of Figure 9 suggest  
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53 that it is unlikely that the gender balance gap is going to close in the near future.  
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<Insert Figure 9>

## DISCUSSION AND CONCLUSIONS

We use a longitudinal data sample drawn from members of a major Australian superannuation provider, which covers employees from a wide cross-section of employers and industries, to explore labor market factors that contribute to lower retirement savings balances for women in Australia. The data allow an examination of the consequences of pension policies and labor market conditions that interact to generate lower savings outcomes for women. The Australian experience offers an insight for those at earlier stages of designing self-funded pension systems.

What has the data told us? First, across many measures, men's and women's outcomes are rarely the same. This highlights the structural features of employment-based DC schemes that generate a gender gap, which, as many surveys indicate, undermine the chances of women being able to generate the same retirement savings as men. Our results provide some empirical support to the simulations conducted by Jefferson and Preston (2005) regarding the projected gendered gap in retirement savings. Second, in exploring the sources of this discrepancy, the data show that substantial savings gaps occur early in paid working life, largely attributable to gaps in younger women's contribution records; contribution gaps seem less evident among older age cohorts, but this may be due to larger numbers of older women leaving paid work (and, therefore, the sample) altogether. This pattern, reflecting those observed in employment data, supports the view that younger women leave paid work, or move to part-time or casual paid work, during the years of family formation. This is supported by the higher levels of

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3 contributions interruptions and irregularity. Third, the decision to work part time, or take career  
4 breaks in early paid working life, appears to affect future income in an adverse way. The gender  
5 distribution of men and women in our contributions-based earnings quartiles demonstrates how  
6  
7 older men increasingly dominate the higher earnings groups, although we have to be careful here  
8 as these figures represent the earnings of different cohorts, and the experience of older women  
9 cannot be transposed back as an assumed future for younger cohorts.

10  
11 Our data show that, through the first decade of the twenty-first century in Australia,  
12 changing balances and contribution distributions demonstrate a clear relative deterioration for  
13 women in their later 20s and early 30s. This indicates that career breaks and part-time paid work  
14 remain the strategy of choice for coping with family caring responsibilities, and that women are  
15 the parents who undertake this. This means that, in early paid working life, the flow of  
16 contributions into retirement savings slows or stops temporarily. This has two major  
17 consequences. First, as widely acknowledged, a return to full-time paid work in one's mid 40s  
18 stabilizes the interrelationship between men's and women's contribution rates, but the damage in  
19 terms of foregone wages and associated retirement savings in their own account has already been  
20 done, and women's balances are much lower. Moreover, this gap might also be explained by the  
21 evidence that women who do return to full-time paid work in their 40s probably have lower  
22 incomes relative to those who leave the labor market permanently. Second, the retirement  
23 savings balances for older women are impacted due to less regular contribution flows – and the  
24 compound returns accruing to lower balances in mid-career exacerbate the gap between men's  
25 and women's super savings, which expands over the final years before retirement, both in a  
26 statistically and economically meaningful way. The care penalty exerted on women's income  
27 security in retirement has long been – and remains – peculiarly marked. Little evidence appears

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3 in our data to suggest that, thanks to changing employment patterns among younger generations  
4 of women, this situation will solve itself in time. On the contrary, there is every reason to  
5 suppose that for the next half-century or more, Australian women without the support of a spouse  
6 will continue to rely overwhelmingly on the age pension. This study contributes to the literature  
7 on gendered gaps in retirement outcomes by providing empirical longitudinal evidence of the  
8 consequences of labor market factors on retirement savings outcomes in Australia, particularly  
9 for women. We provide evidence of the importance of the labor market in Australia in generating  
10 a statistically significant economic disadvantage for women over time.  
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22 Much of the recent response to gender inequalities in pension savings has been to  
23 encourage women to save more. In Australia, for instance, this is advocated through means such  
24 as salary sacrifice or by taking advantage of the state supplements that the Commonwealth  
25 government offers low-income workers. Women live longer, the argument runs, so must save  
26 more in order to guarantee that their funds do not fall short of their needs in later life (Rice  
27 Warner 2014). This is an inadequate response, which will not bridge the gap revealed here. As  
28 Feng and Gerrans (2014) note, fewer women are choosing the tax-advantaged pre-tax savings  
29 options. More constructive suggestions involve including contributions from maternity pay in the  
30 Super Guarantee, but this only offers a very partial compensation (ASFA 2014). Our findings  
31 echo the concerns of others who have examined women's retirement savings (Fernández-López  
32 et al.2015) and those who advocate for the need for these factors to be considered in the context  
33 of public pension schemes for women.  
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49 Other factors, however, also threaten the future of Australian superannuation. The Lucky  
50 Country has enjoyed nearly thirty years of prosperity, relatively full employment, and good  
51 returns on invested funds. However, there are indications that the years of prosperity be over,  
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3 that new entrants into the scheme are not attaining the savings of their older siblings, and that the  
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5 GFC may have exerted a greater influence than previously supposed on jobs for young people  
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7 and thus on their savings for the future (for the European experience, see Karl Hinrichs and  
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9 Matteo Jessoula [2012]). Further research will be able to verify this conclusion in a more  
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11 definitive way, but future safeguards will be needed if this type of personal savings system is  
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13 going to offer a viable and secure retirement for all Australian citizens.  
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17 Finally, our study has several limitations. First, the nature of the data is such that it does  
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19 not contain all of the information that would be helpful for us to analyze, such as information on  
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21 marital status, parenthood, occupation, or savings outside of one's current superannuation fund.  
22  
23 Although Australia seems to experience the same types of gendered differences in retirement  
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25 outcomes that we see elsewhere, one must be wary when generalizing the labor market factors  
26  
27 and subsequent outcomes to other environments.  
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5 **Maria Strydom** (late) was Lecturer in the Department of Finance at the Monash Business  
6 School, Monash University.  
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24 better outcomes for all.  
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35 We would also like to acknowledge the work of our colleague, the late Dr. Maria Strydom.  
36 Maria was a much loved and valued member of our research team, and we greatly miss her.  
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#### 44 TABLES

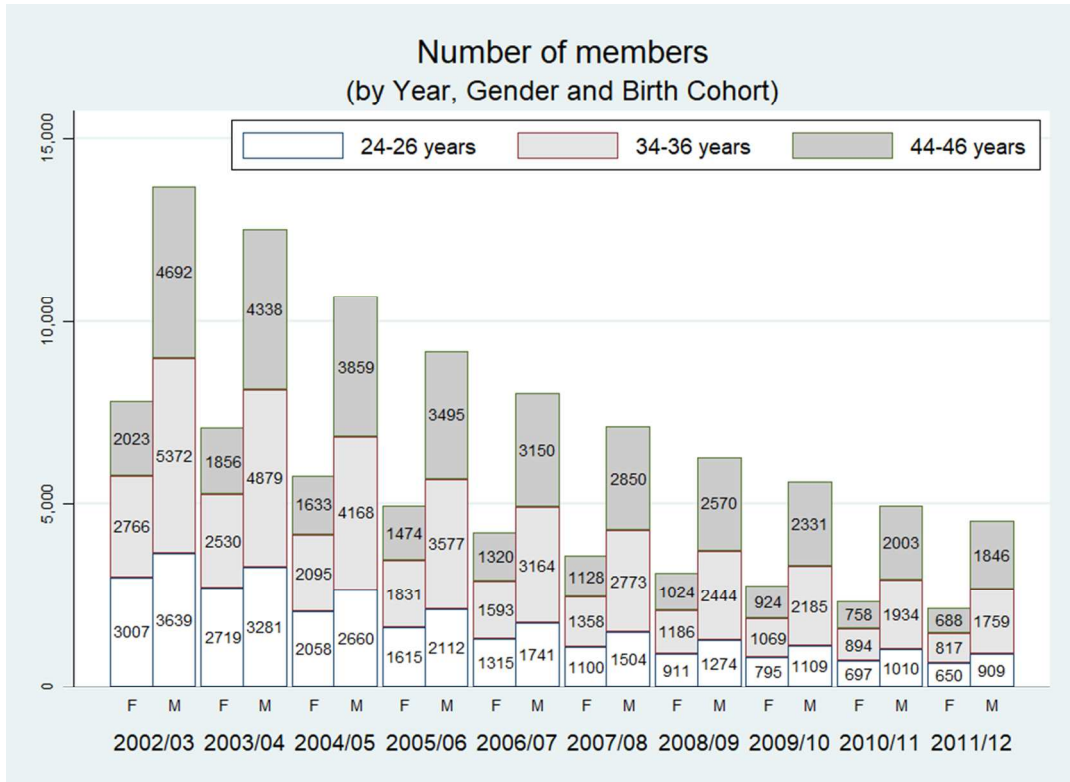


Figure 1 Sample profile by gender, birth cohort, and financial year

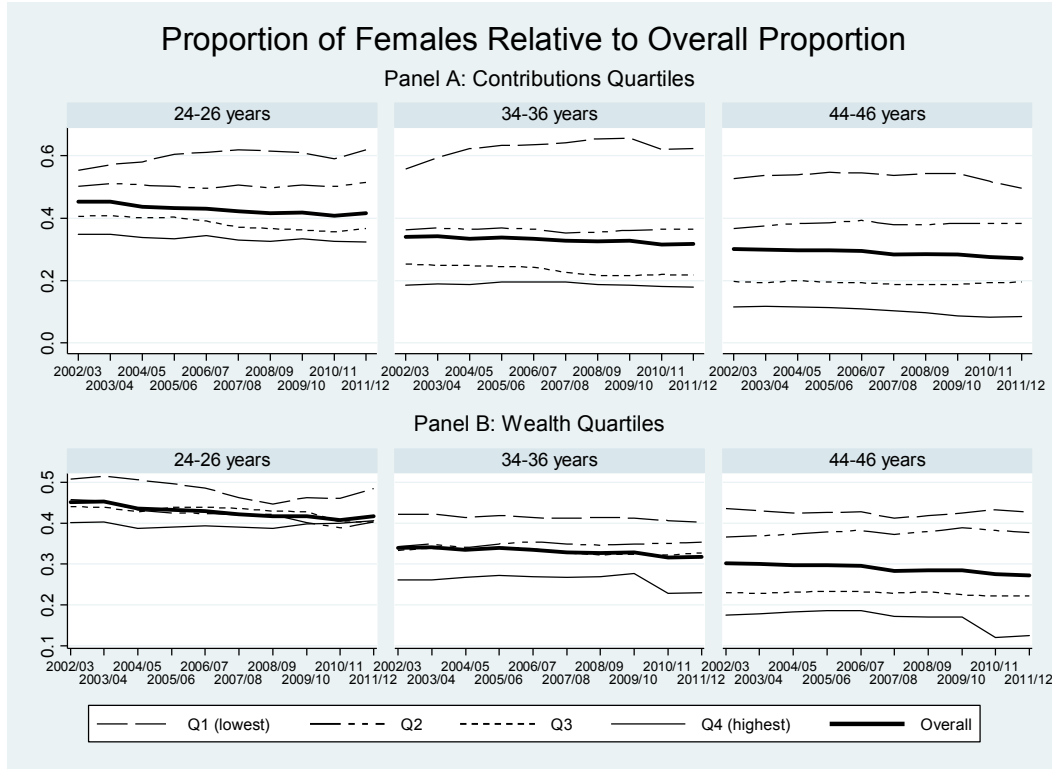


Figure 2 Gender composition by contribution quartiles and wealth quartiles

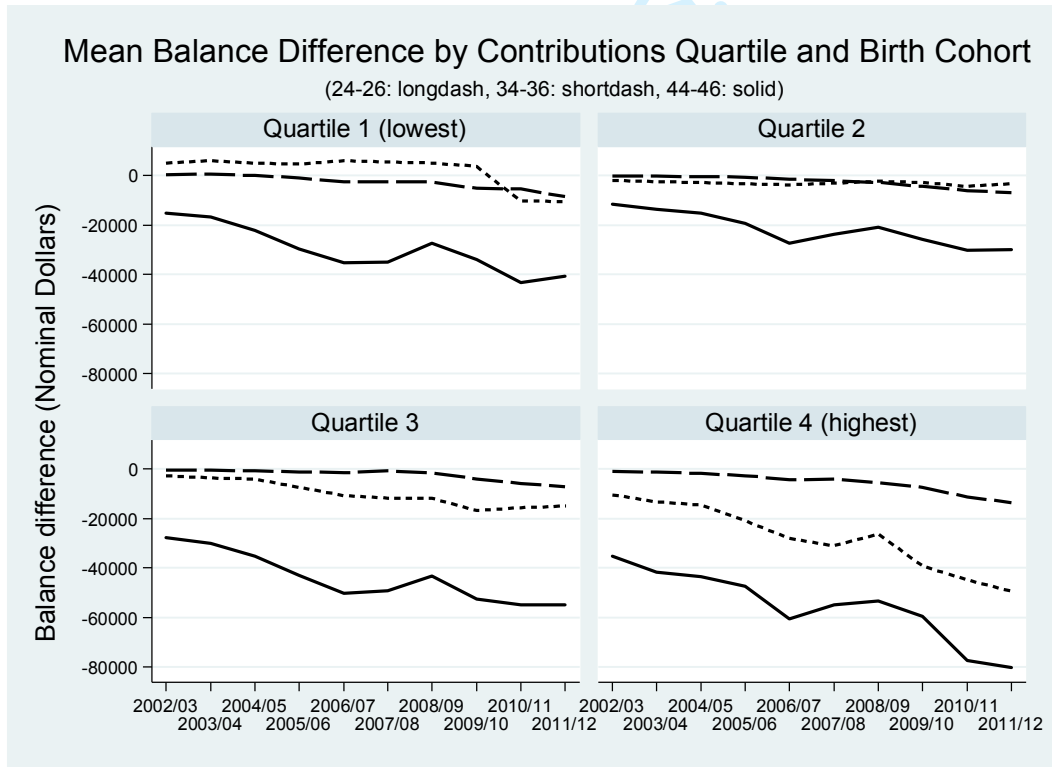
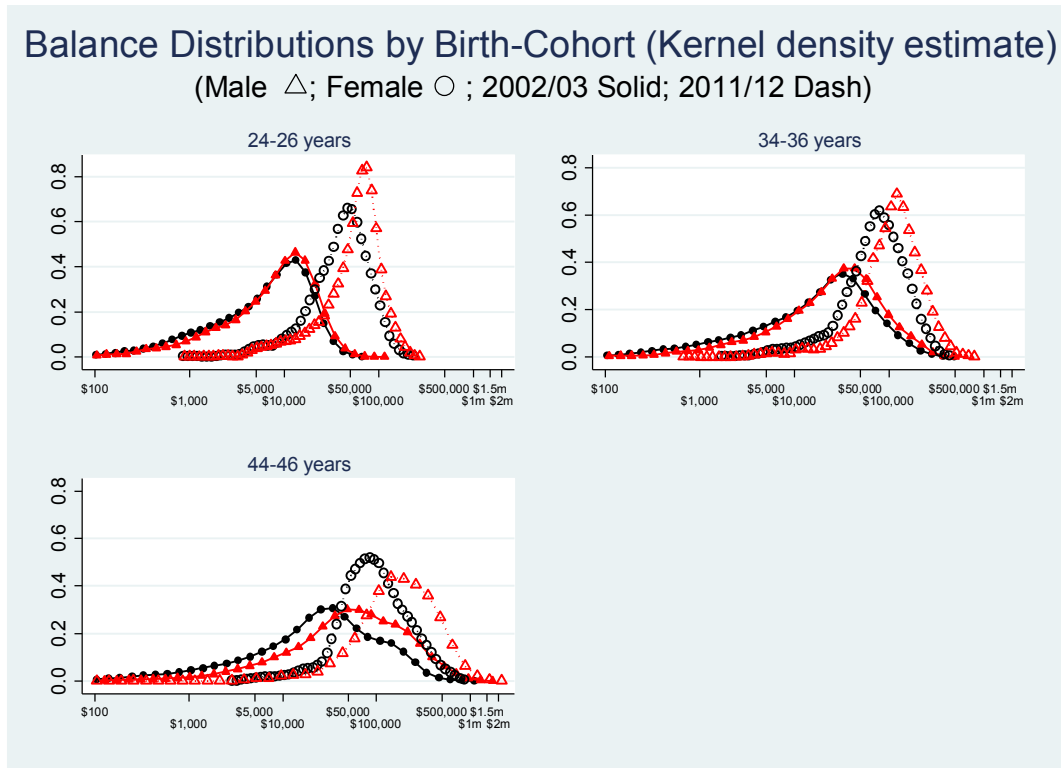
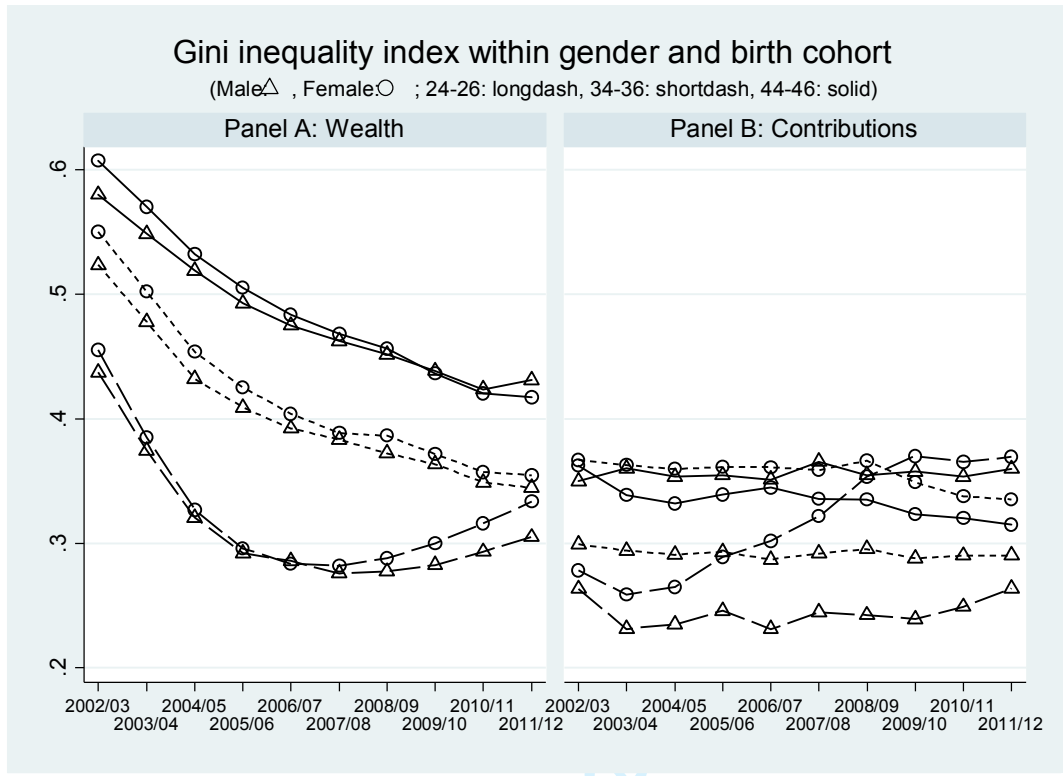


Figure 3 Difference in mean balance by contribution quartiles



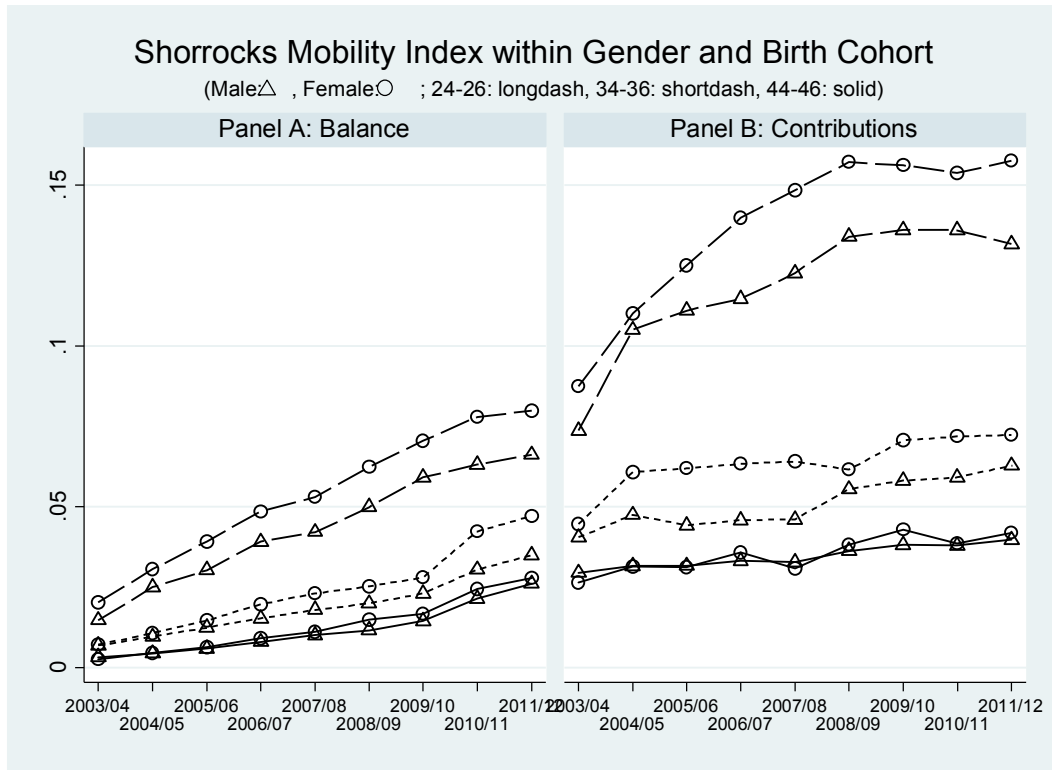
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Figure 4 Balance distributions for birth cohorts 2002/03 vs. 2011/12 (kernel density estimates)



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Figure 5 Gini index within gender and birth cohort



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Figure 6 Mobility Index within gender and birth cohort

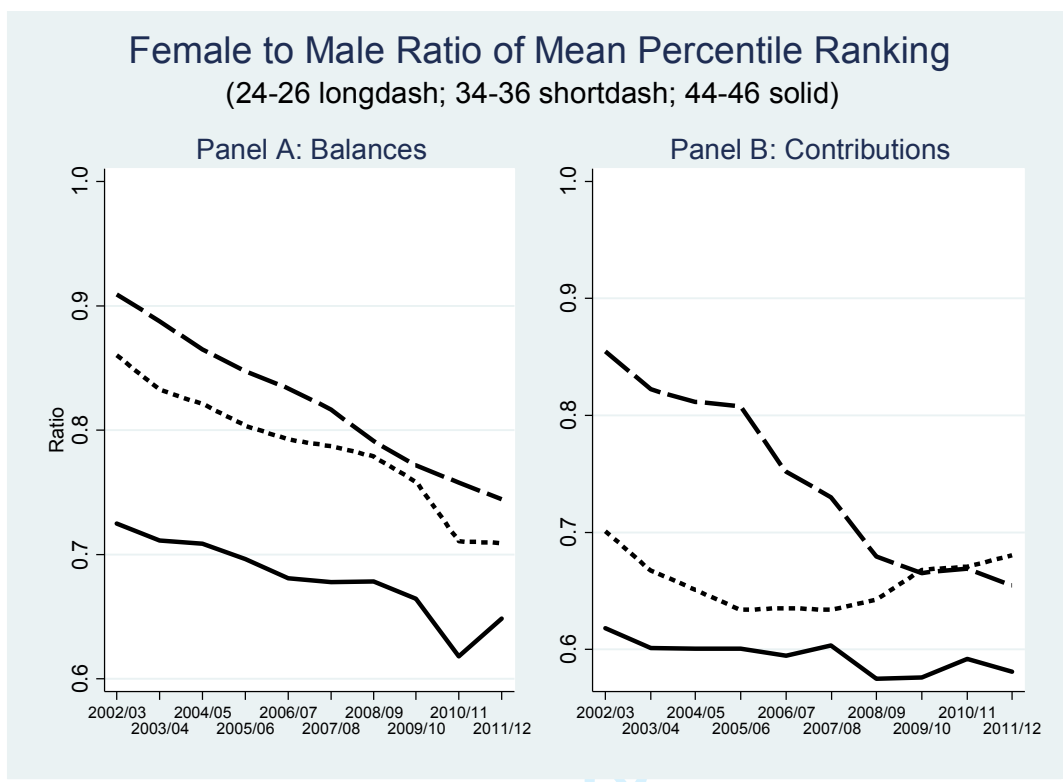


Figure 7 Inequality indices by birth cohort

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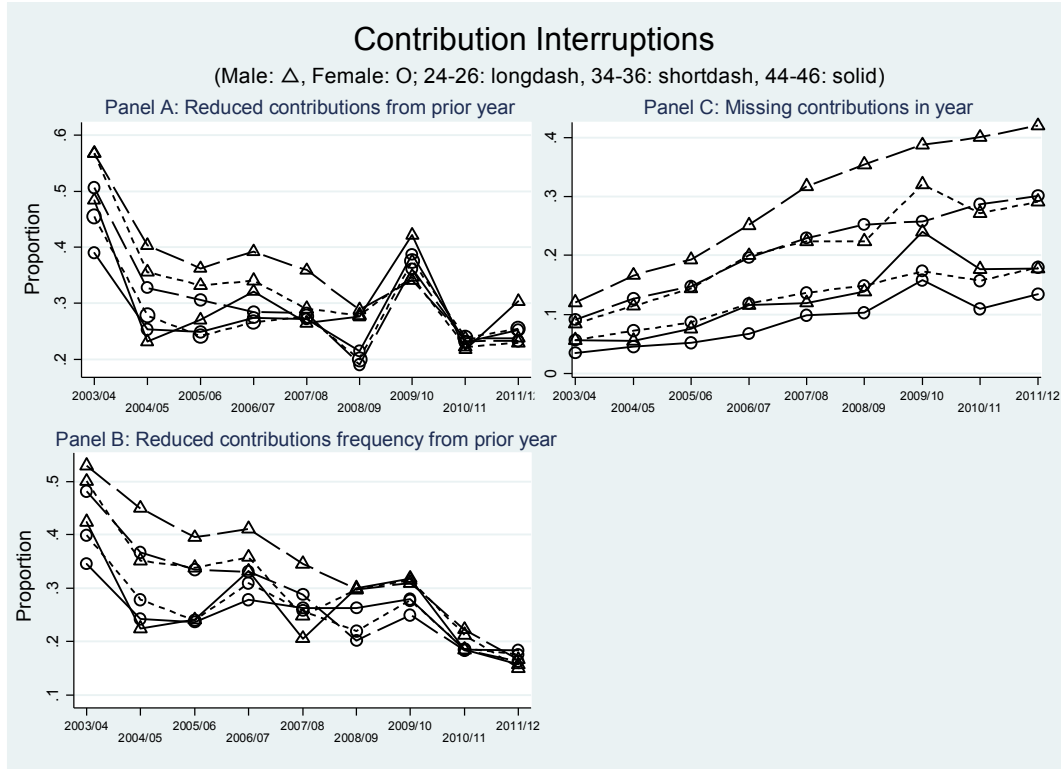
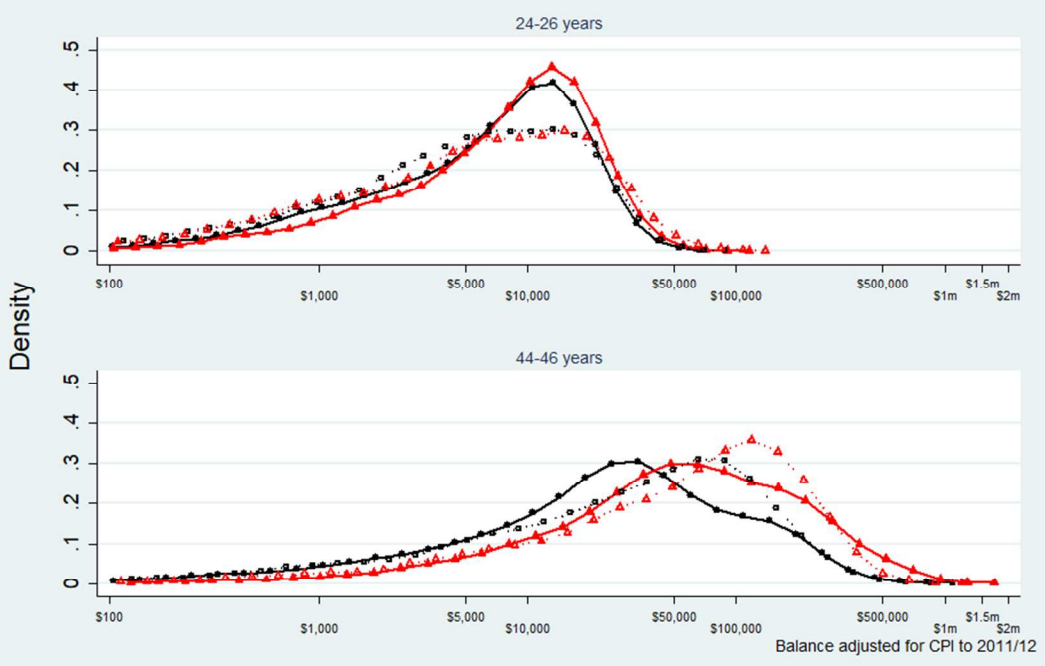


Figure 8 Contribution interruptions

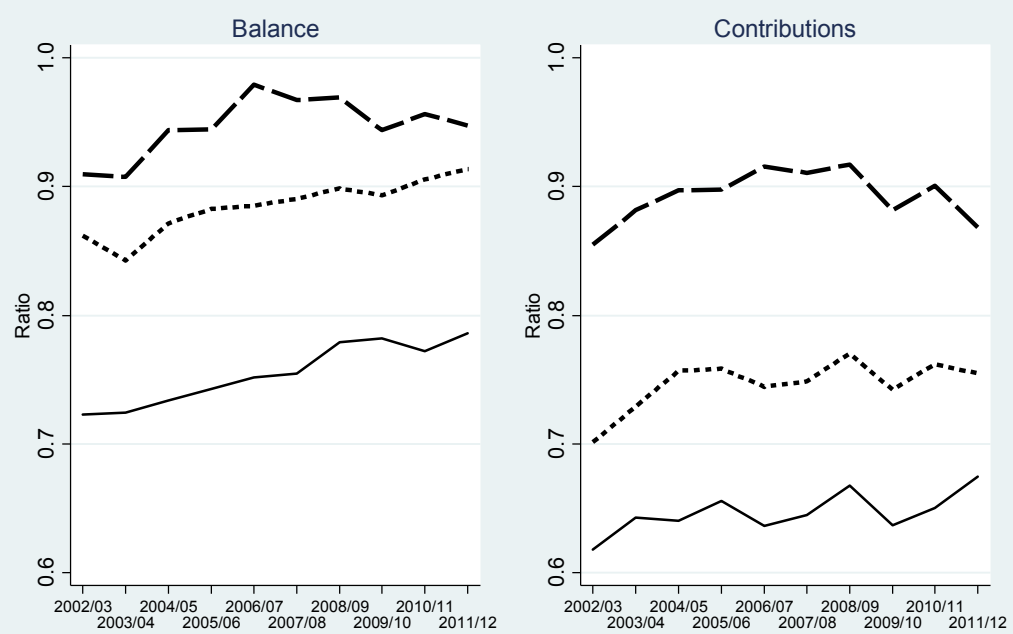
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Panel A: Balance distributions for Age-Cohorts (Kernel density estimate)  
(Male:  $\Delta$ , Female: O; 2002/03: Solid, 2011/12: Dot)



Panel B: Female to Male Mean Percentile Ratio (Age-Cohorts)  
(24-26: longdash, 34-36: shortdash, 44-46: solid)



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3 *Figure 9* Inequality indices by age cohort  
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10 REFERENCES  
11  
12  
13

- 14 Anderson, Deborah J., Melissa Binder, and Kate Krause. 2002. "The Motherhood Wage Penalty:  
15 Which Mothers Pay It and Why?" *American Economic Review* 92(2): 354–8.  
16  
17 ———. 2003. "The Motherhood Wage Penalty Revisited: Experience, Heterogeneity, Work  
18 Effort, and Work-Schedule Flexibility." *Industrial and Labor Relations Review* 56(2):  
19 273–94.  
20  
21 Association of Superannuation Funds of Australia (ASFA). 2014. "The Future of Australia's  
22 Super: A New Framework for a Better System." Sydney: ASFA.  
23  
24 Austen, Siobhan and Richard Seymour. 2006. "The Evolution of the Female Labor Force  
25 Participation Rate in Australia, 1984–1999." *Australian Journal of Labor Economics*  
26 9(3): 305–20.  
27  
28 Australian Bureau of Statistics (ABS). 2003. "6203.0 – Labour Force, Australia, Feb 2003."  
29 ABS, Canberra.  
30  
31 ———. 2004. "1301.0 – Year Book Australia, 2003." ABS, Canberra.  
32  
33 ———. 2016. "6202.0 – Labor Force, Australia, Jan 2016." ABS, Canberra.  
34  
35 Australian Human Rights Commission (AHRC). n.d. "The Gender Gap in Retirement Savings."  
36 Australian Human Rights Commission.  
37  
38 <https://www.humanrights.gov.au/publications/gender-gap-retirement-savings> (accessed  
39 September 2018).  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 Australian Institute of Family Studies. 2018. "Births in Australia." Australian Institute of Family  
4  
5 Studies. <https://aifs.gov.au/facts-and-figures/births-australia>.  
6  
7  
8 Barns, Angela and Alison Preston. 2010. "Is Australia Really a World Leader in Closing the  
9  
10 Gender Gap?" *Feminist Economics* 16(4): 81–103.  
11  
12 Baxter, Jennifer. 2013. "Australian Mothers' Participation in Employment: Analyses of Social,  
13  
14 Demographic and Family Characteristics Using the Household, Income and Labour  
15  
16 Dynamics in Australia (HILDA) Survey." Research Paper 52, Australian Institute of  
17  
18 Family Studies, Australian Government, Canberra.  
19  
20  
21 ———. 2017. "Stay-at-Home Dads." Family Week Fact Sheet 2017. Australian Institute of  
22  
23 Family Studies, Canberra.  
24  
25  
26 Bettio, Francesca, Platon Tinios, and Gianni Betti. 2013. "The Gender Gap in Pensions in the  
27  
28 EU." Publications Office of the European Union, Luxembourg.  
29  
30  
31 Blau, Francine D. and Lawrence M. Kahn. 2016. "The Gender Wage Gap: Extent, Trends, and  
32  
33 Explanations." IZA Discussion Paper 9656, Institute for the Study of Labor (IZA).  
34  
35  
36 Bridgen, Paul and Traute Meyer. 2014. "The Liberalisation of the German Social Model: Public–  
37  
38 Private Pension Reform in Germany since 2001." *Journal of Social Policy* 43(1): 37–68.  
39  
40  
41 Broderick, Elizabeth. 2012. "Women in the Workforce." *Australian Economic Review* 45(2):  
42  
43 204–10.  
44  
45  
46 Broomhill, Ray and Rhonda Sharp. 2005. "The Changing Male Breadwinner Model in Australia:  
47  
48 A New Gender Order?" *Labour and Industry* 16 (1): 103–27.  
49  
50  
51 Cebulla, Andreas, Sarah Butt, and Nick Lyon. 2007. "Working beyond the State Pension Age in  
52  
53 the United Kingdom: The Role of Working Time Flexibility and the Effects on the  
54  
55 Home." *Ageing and Society* 27(6): 849–68.  
56  
57  
58  
59  
60

- 1  
2  
3 Clare, Ross. 2014. "An Update on the Level and Distribution of Retirement Savings." ASFA  
4  
5 Research Paper, The Association of Superannuation Funds of Australia Limited (ASFA).  
6  
7  
8 Clark, Gordon L. and Kendra Strauss. 2008. "Individual Pension-Related Risk Propensities: The  
9  
10 Effects of Socio-Demographic Characteristics and a Spousal Pension Entitlement on Risk  
11  
12 Attitudes." *Ageing and Society* 28(6): 847–74.  
13  
14  
15 Cobb-Clark, Deborah A. 2012. "That Pesky Problem of Persistent Gender Bias." *Australian*  
16  
17 *Economic Review* 45(2): 211–5.  
18  
19  
20 Davis, Kevin. 2012. "Superannuation over the Past Decade: Individual Experiences." A report by  
21  
22 the Australian Centre for Financial Studies for the Australian Institute of Superannuation  
23  
24 Trustees (AIST).  
25  
26  
27 Deininger, Klaus and Lyn Squire. 1996. "A New Data Set Measuring Income Inequality." *World*  
28  
29 *Bank Economic Review* 10(3): 565–91.  
30  
31  
32 Donnelly, Kristin, Jean M. Twenge, Malissa A. Clark, Samia K. Shaikh, Angela Beiler-May, and  
33  
34 Nathan T. Carter. 2016. "Attitudes toward Women's Work and Family Roles in the  
35  
36 United States, 1976–2013." *Psychology of Women Quarterly* 40(1): 41–54.  
37  
38  
39 Drew, Michael, Pieter Stoltz, Adam Walk, and Jason West. 2014. "Retirement Adequacy  
40  
41 through Higher Contributions: Is This the Only Way?" *Journal of Retirement* 1(4): 57–  
42  
43 74.  
44  
45  
46 Ebbinghaus, Bernhard and Noel Whiteside. 2012. "Shifting Responsibilities in Western  
47  
48 European Pension Systems: What Future for Social Models?" *Global Social Policy* 12(3):  
49  
50 266–82.  
51  
52  
53 European Commission. 2013. "The Gender Gap in Pensions in the EU." European Union,  
54  
55 Luxembourg.  
56  
57  
58  
59  
60

- 1  
2  
3 Evandrou, Maria and Karen Glaser. 2003. "Combining Work and Family Life: The Pension  
4  
5 Penalty of Caring." *Ageing and Society* 23(5): 583–602.  
6  
7  
8 Even, William E. and David A. Macpherson. 2004. "When Will the Gender Gap in Retirement  
9  
10 Income Narrow?" *Southern Economic Journal* 71(1): 182–200.  
11  
12  
13 Feng, Jun and Paul Gerrans. 2014. "Patterns of Voluntary Worker Retirement Savings: A  
14  
15 Longitudinal Analysis." Stream 3: Better Superannuation Outcomes Working Paper,  
16  
17 Superannuation Research Cluster, CSIRO-Monash, Monash University.  
18  
19  
20 Fernández-López, Sara, Milagros Vivel-Búa, Luis Otero-González, and Pablo Durán-Santomil.  
21  
22 2015. "Exploring the Gender Effect on Europeans' Retirement Savings." *Feminist*  
23  
24 *Economics* 21(4): 118–50.  
25  
26  
27 Flory, Judith. 2012. "The Gender Pension Gap: Developing an Indicator Measuring Fair Income  
28  
29 Opportunities for Women and Men." Study by the Fraunhofer Institute for Applied  
30  
31 Information Technology (FIT) on behalf of the Federal German Ministry for Family  
32  
33 Affairs, Senior Citizens, Women and Youth.  
34  
35  
36 Folbre, Nancy. 2017. "The Care Penalty and Gender Inequality." In *The Oxford Handbook of*  
37  
38 *Women and the Economy*, edited by Susan L. Averett, Laura M. Argys, and Saul D.  
39  
40 Hoffman, 1–20. New York: Oxford University Press.  
41  
42  
43 Folbre, Nancy, Lois B. Shaw, and Agneta Stark. 2005. "Introduction: Gender and Aging."  
44  
45 *Feminist Economics* 11(2): 3–5.  
46  
47  
48 Frericks, Patricia, Robert Maier, and Willibrord de Graaf. 2006. "Shifting the Pension Mix:  
49  
50 Consequences for Dutch and Danish Women." *Social Policy and Administration* 40(5):  
51  
52 475–92.  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 Gee, Susan, Sik Hung Ng, Ann Weatherall, Jim Liu, Cynthia Loong, and Te Ripowai Higgins.  
4  
5 2002. "Saving Ourselves: Gender Issues in Making Provision for One's Own  
6  
7 Retirement." *Australasian Journal on Ageing* 21(1): 30–5.  
8  
9  
10 Greig, Fiona, Ricardo Haussman, Laura D. Tyson, and Saadia Zahidi. 2006. "The Gender Gap  
11  
12 Index 2006: A New Framework for Measuring Equality." In *Global Gender Gap Report*  
13  
14 2006, edited by Ricardo Haussman, Laura D. Tyson, and Saadia Zahidi, 3–23. Geneva:  
15  
16 World Economic Forum.  
17  
18  
19 Headey, Bruce, Gary Marks, and Mark Wooden. 2005. "The Structure and Distribution of  
20  
21 Household Wealth in Australia." *Australian Economic Review* 38(2): 159–75.  
22  
23  
24 Hill, Elizabeth. 2007. "Budgeting for Work–Life Balance: The Ideology and Politics of Work  
25  
26 and Family Policy in Australia." *Australian Bulletin of Labor* 33(2): 226–45.  
27  
28  
29 Hinrichs, Karl and Matteo Jessoula, eds. 2012. *Labour Market Flexibility and Pension Reforms:*  
30  
31 *Flexible Today, Secure Tomorrow?* New York: Palgrave Macmillan.  
32  
33  
34 Holden, Sarah, Jack VanDerhei, Luis Alonso, and Steven Bass. 2013. "401(k) Participants in the  
35  
36 Wake of the Financial Crisis: Changes in Account Balances, 2007–2011." *ICI Research*  
37  
38 *Perspective* 19(7): 1–16.  
39  
40  
41 Jefferson, Therese. 2009. "Women and Retirement Pensions: A Research Review." *Feminist*  
42  
43 *Economics* 15(4): 115–45.  
44  
45  
46 Jefferson, Therese and Alison Preston. 2005. "Australia's 'Other' Gender Wage Gap: Baby  
47  
48 Boomers and Compulsory Superannuation Accounts." *Feminist Economics* 11(2): 79–  
49  
50 101.  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 Meyer, Traute and Paul Bridgen. 2008. "Class, Gender and Chance: The Social Division of  
4  
5 Welfare and Occupational Pensions in the United Kingdom." *Ageing and Society* 28(3):  
6  
7 353–81.  
8  
9
- 10 Morton, Matthew, Jeni Klugman, Lucia Hanmer, and Dorothe Singer. 2014. "Gender at Work: A  
11  
12 Companion to the *World Development Report on Jobs*." Working Paper 89273, World  
13  
14 Bank.  
15  
16
- 17 Nyberg, Anita. 2012. "Gender Equality Policy in Sweden: 1970s–2010s." *Nordic Journal of*  
18  
19 *Working Life Studies* 2(4): 67–84.  
20  
21
- 22 OECD. 2017. *The Pursuit of Gender Equality: An Uphill Battle*. Paris: OECD Publishing.  
23  
24
- 25 OECD, International Labour Office (ILO), International Monetary Fund (IMF), and the World  
26  
27 Bank Group (WBG). 2014. "Achieving Stronger Growth by Promoting a More Gender-  
28  
29 Balanced Economy." Report prepared for the G20 Labour and Employment Ministerial  
30  
31 Meeting, Melbourne, Australia, September 10–11.  
32
- 33 Olivetti, Claudia and Barbara Petrongolo. 2016. "The Evolution of Gender Gaps in Industrialized  
34  
35 Countries." NBER Working Paper 21887, National Bureau of Economic Research  
36  
37 (NBER).  
38  
39
- 40 Orenstein, Mitchell A. 2011. "Pension Privatization in Crisis: Death or Rebirth of a Global  
41  
42 Policy Trend?" *International Social Security Review* 64(3): 65–80.  
43  
44
- 45 Paglin, Morton. 1975. "The Measurement and Trend of Inequality: A Basic Revision." *American*  
46  
47 *Economic Review* 65(4): 598–609.  
48
- 49 Parr, Nick, Shauna Ferris, and Stéphane Mahuteau. 2007. "The Impact of Children on Australian  
50  
51 Women's and Men's Superannuation." *Economic and Labour Relations Review* 18(1): 3–  
52  
53 26.  
54  
55  
56  
57

- 1  
2  
3 Rice Warner. 2014. "Retirement Savings Gap as at 30 June 2014." Rice Warner.  
4  
5 Scottish Widows. 2015. "2015 Women and Pensions Report." Scottish Widows.  
6  
7  
8 Sefton, Tom, Maria Evandrou, and Jane Falkingham. 2011. "Family Ties: Women's Work and  
9  
10 Family Histories and Their Association with Incomes in Later Life in the UK." *Journal*  
11  
12 *of Social Policy* 40(1): 41–69.  
13  
14  
15 Sefton, Tom, Maria Evandrou, Jane Falkingham, and Athina Vlachantoni. 2011. "The  
16  
17 Relationship between Women's Work Histories and Incomes in Later Life in the UK, US  
18  
19 and West Germany." *Journal of European Social Policy* 21(1): 20–36.  
20  
21  
22 Senate Economics References Committee (SERC). 2016. "A Husband Is Not a Retirement Plan:  
23  
24 Achieving Economic Security for Women in Retirement." SERC, Canberra, Australia.  
25  
26  
27 Shaver, Sheila. 2001. "Pension Reform in Australia: Problematic Gender Equality." In *Women,*  
28  
29 *Work and Pensions: International Issues and Prospects*, edited by Jay Ginn, Debra  
30  
31 Street, and Sara Arber, 179–98. Buckingham: Open University Press.  
32  
33  
34 Shorrocks, Anthony F. 1978. "The Measurement of Mobility." *Econometrica* 46(5): 1013–24.  
35  
36  
37 Skinner, Natalie J., Claire Hutchinson, and Barbara Pocock. 2013. "Flexibility Request-Making  
38  
39 in the Post-Right to Request (RTR) Environment." Paper presented at the 27th  
40  
41 Association of Industrial Relations Academics of Australian and New Zealand  
42  
43 (AIRAANZ) Conference, Fremantle Western Australia, February 6–8.  
44  
45  
46 Van Dalen, Hendrik P., Kene Henkens, and Douglas A. Hershey. 2010. "Perceptions and  
47  
48 Expectations of Pension Savings Adequacy: A Comparative Study of Dutch and  
49  
50 American Workers." *Ageing and Society* 30(5): 731–54.  
51  
52  
53 van den Berg, Bernard, Denzil G. Fiebig, and Jane Hall. 2014. "Well-Being Losses Due to Care-  
54  
55 Giving." *Journal of Health Economics* 35: 123–31.  
56  
57  
58  
59  
60



- 1  
2  
3 Weichselbaumer, Doris and Rudolf Winter-Ebmer. 2005. "A Meta-Analysis of the  
4  
5 International Gender Wage Gap." *Journal of Economic Surveys* 19(3): 479–511.  
6  
7  
8 Yu, Wei-hsin and Pei-lin Lee. 2013. "Decomposing Gender Beliefs: Cross-National Differences  
9  
10 in Attitudes toward Maternal Employment and Gender Equality at Home." *Sociological*  
11  
12 *Inquiry* 83(4): 591–621.  
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19 NOTES  
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25 <sup>1</sup> Superannuation savings can be accessed earlier depending on date of birth. The earliest is age  
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27 55 for those born before July 1, 1960 and increases to age 60 for those born on or after July 1,  
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29 1964. Withdrawals are only tax free from age 60.  
30

31  
32 <sup>2</sup> However, the practical difference of the act has been questioned (Natalie J. Skinner, Claire  
33  
34 Hutchinson, and Barbara Pocock 2013).  
35

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37 <sup>3</sup> For example, as Jennifer Baxter (2013) highlights, the employment rate for mothers has  
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39 increased from 55 percent in 1991 to 65 percent in 2011, though disproportionately in part-time  
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41 paid work.  
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44 <sup>4</sup> For comparison, through 2012, which is the final year of our data, the AUD traded at a slight  
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46 premium to the USD, and the AUD was worth approximately €0.80.  
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49 <sup>5</sup> Unless a member joins on the first day of the financial year, their total contributions need to be  
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51 annualized. Given that not all individuals are employed on the same frequency of contributions,  
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53 extrapolating from a small number of observations can provide an inaccurate estimate, and we,  
54  
55 therefore, use full financial years (July 1 to June 30) to avoid these issues.  
56  
57