The Evolution of the Earnings Distribution in a Sustained Growth Economy: Evidence from Australia*

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Abstract

We study the evolution of the earnings distributions in Australia from 1991 to 2020, a prolonged period of sustained economic growth without recession. Using a 10% sample of Australian taxpayer records, we document key trends in labour earnings inequality, mobility and risk for workers aged 25 to 55. Our findings reveal strong upward earnings mobility for both men and women. Earnings inequality rose modestly until the early 2010s, driven by top earners, but has since declined. The gender gap in earnings inequality has narrowed, and even reversed in recent years, mainly due to a sharp reduction in inequality among women at the lower end of the earnings distribution. Early-life disparities also play an increasingly important role in shaping later-life inequality, particularly for younger cohorts. This reversal in inequality trends has emerged over the past decade, coinciding with a slowdown in economic growth. Moreover, although aggregate macroeconomic conditions have been relatively stable, idiosyncratic earnings risk—captured by dispersion, skewness, and kurtosis—remains persistent, with greater volatility at both the top and bottom percentiles. Women continue to face higher risk and lower mobility than men, despite experiencing stronger average earnings growth over the entire period. Hence, our findings provide new insights into how prolonged economic expansion shapes the dynamics of earnings across different demographic and income groups.

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1 Introduction

Widening income and wealth disparities between the rich and poor pose unprecedented challenges for many countries. How are workers' labour earnings tied to economic growth? How do their earnings distributions evolve across socioeconomic and demographic groups? What insights do these patterns provide regarding the progression of income inequality over time? Understanding these dynamics is crucial for assessing long-term economic outlook and welfare, as well as for designing effective policy interventions. This research addresses these questions by documenting trends in earnings inequality, dynamics, and mobility in Australia during the three decades of sustained economic growth without recession.

Australia presents a unique case study for at least two key reasons. First, from the 1990-91 recession until the onset of the COVID-19 pandemic in early 2020, the country experienced three decades of uninterrupted economic expansion. This offers a rare opportunity to examine changes in earnings distribution without the confounding effects of major recessions. Second, tax thresholds are not indexed to inflation, resulting in bracket creep, while transfer benefits are extensively means-tested to target those most in need. Although Australia's income tax code underwent significant reforms, including a series of tax cuts starting in the early 2000s, the combined tax-and-transfer system continues to maintain a high level of progressivity. This strong redistributive framework provides a valuable setting to examine how inequality and mobility evolve in an environment where fiscal policy actively shapes income redistribution—a phenomenon common among many OECD countries. Moreover, this policy setting allows us to assess the effectiveness of government interventions in mitigating labour earnings inequality.

To achieve this, we use a 10% sample of administrative tax records from the Australian Tax Office (ALife) and track the evolution earnings levels and earnings growth (or changes) from 1991 to 2020.[1] For international comparability, we follow the methodology proposed in Guvenen, Pistaferri and Violante (2022) to select data samples of male and female workers aged 25 to 55 and compute key summary statistics.[2] This approach enables us to map out a comprehensive picture of labour earnings inequality, dynamics and mobility. We also assess the extent of idiosyncratic earnings risk faced by Australian workers by computing the second- and higher-order moments of residualized log earnings growth (i.e., earnings shocks). Our main results are as follows.

First, we find an upward trend in earnings growth across the distribution over the study period. By 2020, median log real earnings were 25 log points higher for men (i.e., male workers) and 35 log points higher for women (i.e., female workers) compared to 1991. However, earnings growth stagnated during the last decade of macroeconomic slowdowns following the 2008 Global Financial Crisis (GFC), particularly among the top 10% of earners and for men in general.

Second, overall earnings inequality increased modestly, contrasting sharply with the large increase in inequality documented in the US and many other OECD countries (e.g., see Piketty and Saez 2003; Krueger et al. 2010; Piketty, Saez and Zucman 2018; Guvenen et al. 2023). The first two decades were

[1] The Person Level Integrated Data Asset (PLIDA) is another administrative dataset that covers the entire population of Australian taxpayers. However, PLIDA only has data from 2000 onward.

[2] The Global Repository of Income Dynamics (GRID) is an open-access international database that provides micro-level statistics on income inequality and income dynamics. Currently, the GRID project has data from 13 countries: Argentina, Brazil, Canada, Denmark, France, Germany, Italy, Mexico, Norway, Spain, Sweden, the UK, and the US. All statistics are derived from administrative earnings records and harmonized for cross-country comparability. Note that, this project is not officially associated with the GRID project. For comparison, we provide similar micro-level statistics for Australia on our project website.

characterized by widening inequality, driven largely by a pronounced divergence in earnings growth between the bottom and top ends of the distribution, particularly among men. The top 10% of earners experienced growth rates nearly twice as fast as the rest of the distribution, while the top 1%, 0.1%, and 0.01% exhibited even steeper upward trajectories. In contrast, lower-income men faced significant declines in earnings growth during economic slowdowns, followed by a prolonged and sluggish recovery compared to their higher-income and female counterparts. However, this trend shifted in the 2010s, when overall earnings inequality began to decline. Two key factors drove this shift: (i) stagnating earnings growth among the top 10% of earners and (ii) sustained and robust growth among women, especially low-income women. The contrasting growth trajectories also produced divergent trends in earnings inequality by gender. While men experienced a greater acceleration in inequality, women's bottom-end inequality declined steadily over the same period. These patterns contributed to the reversal in gender earnings inequality during the latter half of the 2010s.

Third, early-life disparities—rooted in initial conditions such as education and parental background—have become increasingly important in determining lifetime inequality for both men and women. Older cohorts experienced substantial changes in inequality over the course of their working lives, suggesting a significant role for adult income shocks. In contrast, younger cohorts, particularly those who entered the labour market in the early 2010s, saw their lifetime earnings inequality largely determined by the initial inequality levels. Similar to the trends in earnings growth and overall inequality, this shift aligns with the macroeconomic context of slowing GDP growth.

Fourth, our examination of the distribution of residualized log earnings growth (i.e., earnings shocks) reveals a significant deviation from the normal (Gaussian) distribution. The data show positive (right) skewness, excess (leptokurtic) kurtosis, and thick double Pareto tails. The peakedness and thick tails are reflected in the very high kurtosis in excess of 10.38 for men and 9.07 for women, relative to the Gaussian benchmark of 3. Notably, these moment statistics remain relatively stable over time and exhibit cyclical features. During macroeconomic slowdowns, earnings shock volatility increases markedly for low-income earners while decreasing for higher earners. Downturns also elevate tail risks, amplifying both the severity and probability of extreme negative shocks.

Furthermore, the patterns of dispersion, asymmetry, and heavy tails in the earnings shock distribution—which capture idiosyncratic earnings risk—persist across demographic and socioeconomic groups over the three decades of sustained growth. Low-income earners, particularly young women, continue to face relatively high volatility in their earnings. Additionally, while men encounter extreme shocks more frequently, women experience more severe negative shocks. These findings highlight the enduring and unequal nature of earnings risk, highlighting vulnerabilities among specific demographic groups even in a prolonged period of economic expansion. Of particular relevance to quantitative studies, the stable and persistent nature of earnings dynamics suggests relatively predictable earnings trajectories for workers throughout the study period.

Fifth, we explore how earnings dynamics affect earnings mobility by examining the average rank-rank mobility of permanent earnings over a 10-year period. We find that earnings dynamics at lower permanent income ranks are positively correlated with mobility. In particular, the relatively higher dispersion, positive skewness, and lower kurtosis among the lower income quantiles are associated with strong upward mobility. Upward mobility remained significant and stable throughout the observed period for both men and women. For men, the rank-rank measure indicates that a worker at the 25th percentile (approximately the poverty line) can achieve close to median income within a decade.

Furthermore, although women are generally less mobile, the rank-rank measure crosses the 45-degree line at the 70th percentile for men and the 50th percentile for women, significantly higher than in countries that have experienced major recessions, such as the US, the UK, and Canada (McKinney, Abowd and Janicki 2022; Bell, Bloom and Blundell 2022; Bowlus et al. 2022), as well as countries with stagnating economies, such as Italy (Hoffmann, Malacrino and Pistaferri 2022).

Finally, we extend our analysis to examine income inequality, dynamics and mobility after taking into account capital earnings, taxes and transfers. Market income, defined as the sum of labour and capital earnings, closely mirrors labour earnings trends with minimal deviations, indicating that capital earnings contribute little additional inequality or mobility in Australia. Post-government income, which incorporates taxes and transfers, shows reduced inequality levels, demonstrating the effectiveness of fiscal policies. Designed with redistributive objectives, these policies compress income growth at the top and reduce volatility for low-income earners, especially younger women. However, their impact does not fundamentally alter the long-term patterns of income inequality or risk. This finding offers insights into the extent to which fiscal policy influences income dynamics in Australia.

In summary, our analysis identifies two distinct episodes in Australia's earnings inequality trends. From 1991 to 2010, strong earnings growth at the very top led to rising inequality, while the following decade's economic slowdowns saw reduced top-end growth and a decline in inequality. Over the three decades, women and top earners maintained growth advantages, while low-income men faced stagnation. Earnings risk remained relatively stable, with heightened risk for low-income earners and young women. Nonetheless, Australia maintained stronger upward mobility than many other OECD countries. Lastly, fiscal policies helped reduce inequality and buffer income volatility at the bottom of the distribution but did not significantly alter broader inequality patterns or earnings dynamics.

Our paper proceeds as follows. Section 2 provides a description of the data and policy settings in Australia. Section 3 presents core statistics on labour earnings inequality, dynamics and mobility. Section 4 presents additional statistics using different income measures that incorporates capital earnings, taxes and public transfers. Section 5 concludes. We provide additional results and supporting information in the Appendix.[3]

Related studies. Our paper is closely related to studies from the Global Repository of Income Dynamics (GRID) project by Guvenen, Pistaferri and Violante (2022). Adopting a similar methodology, we present a range of comparable statistics on earnings inequality, dynamics and mobility in Australia over three decades of sustained economic growth (1991–2020). By adding the unique case of Australia to this literature, our study enhances international comparison and provides new insights from Australia's distinct experience. This work also contributes to the broader literature on income inequality in advanced economies (e.g., see Piketty and Saez 2003; Krueger et al. 2010; Piketty, Saez and Zucman 2018; Guvenen et al. 2023; Saez and Zucman 2020; Heathcote, Storesletten and Violante 2020; Lippi and Perri 2023; Karahan, Ozkan and Song Forthcoming) and to the body of studies documenting income dynamics and inequality trends in the US (e.g., see Guvenen et al. 2021; De Nardi et al. 2021; Guvenen et al. 2023; Heathcote et al. 2023; Auten and Splinter 2024).

There is a large literature documenting income inequality and dynamics in Australia (e.g., see Leigh 2005; Wilkins 2015; Chatterjee, Singh and Stone 2016; Kaplan, Cava and Stone 2018; Productivity Commission 2018; Fisher-Post, Herault and Wilkins 2022; Tin and Tran 2023). Our paper

[3]We also provide more statistics in our online Technical Appendix.

is also related to empirical studies on the redistributive and social insurance roles of the Australian tax and transfer system (Herault and Azpitarte 2015; Tran and Zakariyya 2021; Tran and Zakariyya 2023). Tran and Zakariyya (2023) highlight the critical role of Australia's progressive tax and transfer system in mitigating the distributional effects of uneven gains from economic growth, using a sample of individual records from 10% of Australian taxpayers. In contrast, this paper focuses on the evolution of earnings distribution over the long period of sustained economic growth, using the same data source but restricting the samples to Australian taxpayers aged from 25 to 55 (i.e., workers) as in Guvenen, Pistaferri and Violante (2022). This approach allows us to provide directly comparable statistics to those of other economies in the GRID project. We therefore connect the Australian inequality literature to the global research on earnings inequality and mobility trends (e.g., see Guvenen, Pistaferri and Violante 2022; McKinney, Abowd and Janicki 2022; Bell, Bloom and Blundell 2022; Bowlus et al. 2022; Hoffmann, Malacrino and Pistaferri 2022).

2 Data and the Australian context

This section provides an overview of the data and the economic and policy settings in Australia between 1991-2020.

2.1 Data and variable construction

Our primary data source is the Australian Tax Office (ATO) Longitudinal Information Files (ALife), which contains a 10% random sample of individual tax filers drawn from the ATO's 2016 client register. The data includes tax records for each individual, covering the period 1991-2020. Each year, a 10% random sample of new tax filers is added to the dataset.[4] In the Australian income tax system, there is no joint filing of tax returns. Thus, our unit of measurement is the individual. This means our cross-sectional sample provides a point-in-time snapshot of annual earnings, income, tax payments, and public transfers at the individual level between 1991-2020. We use the Consumer Price Index (CPI) to convert all monetary variables to 2020 Australian dollars.

Sample selection. To enable meaningful comparisons between Australia and other countries, we follow the GRID project methodology, restricting our sample to those workers aged from 25 to 55 whose annual earnings exceed a minimum threshold $\underline{y}$. This threshold is equal to what a worker would earn if they were to work part-time for one quarter at the national minimum wage.[5] We construct the following three samples for our analysis:

1. *Cross-sectional (CS) sample*: All individuals who satisfy the aforementioned age and earnings criteria in a given year t form the cross-sectional (CS) sample for that year. The CS sample covers the period 1991-2020 and is used to compute cross-sectional inequality statistics.

2. *Longitudinal (LX) sample*: The longitudinal sample (LX) is a subset of the CS sample, constructed to study the distribution of residualized log earnings growth/changes (*earnings shocks*).

[4] For more information on the ALife data and its compilation, see the ALife website and Abhayaratna, Carter and Johnson (2021).

[5] Specifically, the formula for the minimum threshold is $\underline{y}$ = part-time adjustment × minimum wage per week × 12. We obtained historical minimum wage per week data from Hamilton (2022). The part-time adjustment factor is the average weekly hours of part-time work divided by 38 hours (full-time equivalent). The average weekly hours of part-time work were sourced from the Australian Bureau of Statistics (ABS) Labour Force Survey.

This requires that we restrict our CS sample to those individuals with 1-year and 5-year forward earnings changes, forming the LX sample that spans the years 1991-2015.

3. *Heterogeneity (H) sample*: The heterogeneity (H) sample further restricts the LX sample to individuals for whom a permanent earnings measure can be constructed (see below). Specifically, it requires individuals to have been in the sample for the three previous consecutive years. The H sample, which includes the years 1993-2015, is used to study earnings variation across demographic groups.

Variable construction. Our main earnings variable is real total labour income, indexed to 2020 Australian dollars using the CPI. Based on this variable, we construct the following earnings measures for worker i in year t:

1. *Raw real earnings*: in levels, y_{it}, and in logs, $\log(y_{it})$.

2. *Residualized log earnings*, ε_{it} : Computed by regressing log real earnings on a full set of age dummies, separately for each year and gender. It controls for trends in earnings across workers at different stages of their life or business cycle.

3. *Permanent earnings*, P_{it-1}: Defined as the average earnings over the previous three years, $P_{it-1} = \left(\sum_{s=t-3}^{t-1} y_{is}\right)/3$. We compute percentiles of permanent earnings.

4. *Residualized permanent earnings*, ε_{it}^{P}: Computed from P_{it-1} by applying the same method used to compute ε_{it}.

5. *1-year change in residualized log earnings*, g_{it}^{1}: Denoted as $g_{it}^{1} = \Delta\varepsilon_{it} = \varepsilon_{it+1} - \varepsilon_{it}$, this represents the 1-year forward change in the residualized log earnings, ε_{it}. This measure is also referred to as the *1-year earnings shocks*.

6. *5-year change in residualized log earnings*, g_{it}^{5}: Denoted as $g_{it}^{5} = \Delta^{5}\varepsilon_{it} = \varepsilon_{it+5} - \varepsilon_{it}$, this represents the 5-year forward change in the residualized log earnings, ε_{it}. This measure is also referred to as the *5-year earnings shocks*.

Throughout the paper, we refer to percentiles of the distributions of these earnings measures using the notation px, where x $\in [0, 100]$. For instance, p50 denotes the median, while p10 represents the 10th percentile. Similarly, p50-p10 refers to the difference between the median and the 10th percentile.

Descriptive statistics. Table 1 presents the sample sizes for the three samples. After imposing restrictions on age and minimum earnings for cross-sectional analysis (CS sample), we are left with approximately 55% of the original dataset. Further restricting the sample for longitudinal analysis (LX sample)—which requires observations with 1- and 5-year forward earnings changes—reduces the sample to around 40% of the original dataset. The proportion of women in the original dataset ranges between 44% and 49% and remains virtually unchanged in the CS sample. However, it slightly decreases after additional sample selections to allow for the computation of 1- and 5-year changes (LX sample) and permanent earnings (H sample).

Table 1: **Sample size and percentage of women in ALife (Original), CS, LX and H samples by year.**

	Number of individuals				Percentage of women			
Year	Original	CS	LX	H	Original	CS	LX	H
1991	983,476	530,283	378,260	-	44.92	43.14	41.76	-
1995	1,012,618	562,889	409,693	331,145	45.4	44.31	43.23	41.99
2000	1,076,253	626,512	446,972	372,791	46.31	45.48	44.34	43.28
2005	1,205,964	666,143	477,674	395,078	47.89	46.14	44.97	44.06
2010	1,340,228	739,348	528,695	439,966	48.05	46.7	45.53	44.81
2015	1,432,924	798,600	564,879	470,454	47.99	47.01	46.57	45.67
2020	1,557,642	854,916	-	-	49	48.22	-	-

Table 2 provides a snapshot of our cross-sectional data sample from 1991 to 2020, reported at five-year intervals. The number of workers in the sample increased from 0.983 million to 1.557 million over the 30-year period. Average earnings increased by almost 30%, while the standard deviation doubled. The fraction of female workers increased, as did women's average earnings relative to men. Over the same period, the age distribution of taxpayers shifted, reflecting an aging demographic structure.[6]

Table 2: **Descriptive statistics for selected cross-sectional samples.**

		Earnings (both)			Mean earnings		Age shares (%)		
Year	Obs. (mill.)	Mean	SD	Women (%)	Men	Women	[25,35]	[36,45	[45,55]
1991	0.53	49,965	35,630	43	59,420	37,504	42.86	35.01	22.13
1995	0.56	52,237	39,003	44	61,797	40,223	40.69	34.27	25.05
2000	0.63	58,983	315,590	45	69,881	45,921	38.31	34.06	27.63
2005	0.67	60,630	56,026	46	71,519	47,922	37.07	33.46	29.47
2010	0.74	65,355	63,158	47	77,544	51,441	37.18	32.55	30.28
2015	0.80	69,091	71,117	47	82,165	54,353	39.20	31.61	29.20
2020	0.85	71,609	65,723	48	83,375	58,974	39.90	31.76	28.34

Note: Annual earnings reported in $2020 Australian dollars.

Table 3 reports summary statistics for the annual real earnings distribution in the cross-sectional sample over time. There is a wide dispersion in earnings, with the 2.5th and 99th percentiles corresponding to approximately 14% and 460% of the median earnings, respectively. As detailed in subsequent sections, overall real earnings rose over the period, but the growth rate also increased monotonically with earnings percentiles. Specifically, between 1991 and 2020, real earnings at the 10th percentile grew by 44%, while earnings at the 95th, 99th and 99.9th percentiles increased by 59%, 75%, and 94%, respectively.

[6] Appendix Tables present more information on selected percentiles of the annual earnings distribution over time for all samples.

Table 3: **Selected percentiles of the annual earnings distribution (men and women combined).**

Year	P2.5	P10	P25	P50	P75	P90	P95	P99	P99.9
1991	5,715	12,943	27,630	46,245	65,455	85,308	102,138	158,569	329,159
1995	5,667	12,905	27,909	47,460	68,148	90,141	109,753	177,090	389,598
2000	6,251	14,516	30,667	51,612	75,125	101,548	126,235	218,811	524,217
2005	6,492	14,824	30,947	52,634	77,531	106,029	132,339	234,469	567,601
2010	6,558	15,379	31,863	55,145	83,494	117,280	148,549	261,924	651,935
2015	7,289	16,720	33,471	57,124	87,325	126,514	162,127	279,898	659,699
2020	8,463	18,646	36,121	60,078	91,190	129,915	162,151	277,957	637,429

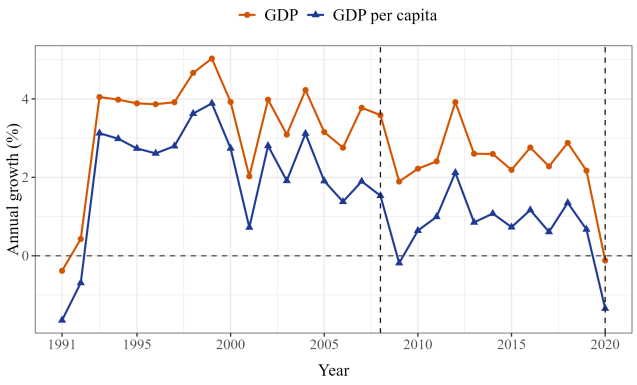
Note: Annual earnings reported in 2020 Australian dollars.

2.2 Economic and policy settings in Australia

Australia has undergone various economic and policy developments that shape the evolution of earnings distribution over time. Below, we provide a brief discussion of some salient features of the macroeconomic changes during the study period.

First, Australia has experienced several significant mining booms, which were primarily driven by global demand for its natural resources. Two major booms occurred within this period: the China-led mining boom of the 2000s and the lithium and rare earths boom of the 2010s. These booms played a crucial role in shaping macroeconomic conditions by boosting investment, employment, and terms of trade. During this period, the Australian economy has relied heavily on skilled immigrants to fill labour shortages.

Figure 1: **Annual growth in Australia (1991-2020).**



Second, Australia experienced 30 years of sustained economic growth from late 1991 until the onset of the COVID-19 pandemic in early 2020. Figure 1 plots the growth of real GDP and real GDP per capita from 1991 to 2020. Although the early-1990 to late-1991 recession led to significant drops in output and living standards, the following three decades were characterized by uninterrupted growth. As shown, while annual GDP growth fluctuated, it remained positive throughout the period. The 1990s were a period of rapid economic growth, with annual GDP increasing at 4% or higher, while the 2000s saw a moderation to approximately 3%. The 2008-09 Global Financial Crisis (GFC) had a notable impact but did not push Australia into a recession. The negative GDP per capita growth in

2018 was primarily driven by a surge in immigration. However, the 2010s marked a gradual secular decline in economic growth, reflecting an economic slowdown.[7]

Third, substantial changes to labour laws and industrial policies took place during this period. Notably, Enterprise Agreements became part of the industrial relations system in the early 1990s and have evolved considerably over time. Enterprise Agreements are designed to suit the needs of individual enterprises, allowing them to negotiate employment conditions—such as wages and other terms—tailored to their specific circumstances, therefore providing greater flexibility than the traditional industry-wide awards system.

Fourth, the progressive income tax schedule is not indexed automatically to nominal income. Instead, the Australian government adjusts income tax brackets through discretionary changes, often leaving them unchanged for extended periods.[8] Income thresholds and marginal tax rates remained virtually unchanged during the 1990s, despite strong economic growth. In the 2000s, the government actively increased income tax thresholds and reduced marginal tax rates, but no significant adjustments were made in the 2010s. As a direct consequence, the growth in nominal income has gradually pushed more tax payers into higher marginal tax brackets, leading to implicit and uneven tax increases. This phenomenon, known as "bracket creep", contributes to income inequality and may influence work incentives and earnings differently across income groups.

3 Core statistics

This section presents our main findings on the evolution of earnings inequality, mobility, and risk in Australia from 1991 to 2020, using administrative tax data from ALife. We begin by examining the percentiles of log earnings levels across years. Next, we analyze income inequality, both in cross-sectional data and by cohort over the life cycle. We then explore measures of idiosyncratic earnings risk, focusing on the dispersion, skewness, and excess kurtosis of 1-year changes in residualized log earnings (i.e., 1-year earnings shocks). Finally, we assess income mobility. Most statistics are reported separately for men and women to highlight gender-specific patterns.

3.1 Earnings inequality over time

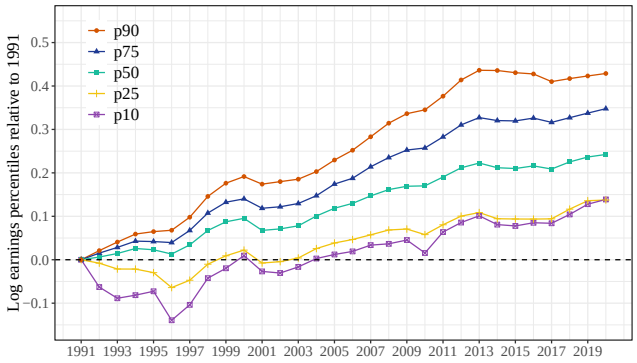
To understand how inequality evolved over time, we begin by examining key trends in earnings levels in Australia. For men and women separately, we compute annual statistics for the 10th, 25th, 50th, 75th, and 90th percentiles of the cross-sectional distribution of various earnings measures between 1991 and 2020. We also compute similar statistics for the top of the distribution—specifically, the 95th, 99th, 99.9th, and 99.99th percentiles. To capture inequality more broadly, we report multiple measures, including the Gini coefficient, to ensure robustness and facilitate comparison with other studies. We conclude this subsection by presenting earnings levels and inequality measures over time for selected cohorts to explore how inequality evolves over the life cycle during the period of analysis.

[7] We provide additional information on income growth across groups and over time on our website for the Growth and Inequality in Australia Project.

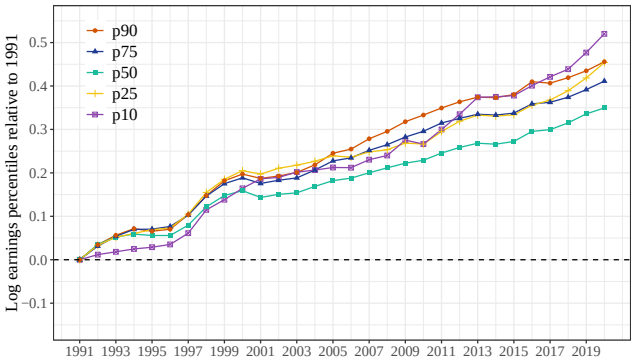
[8] The introduction of the New Tax System (Goods and Services Tax) Act 1999 led to a series of changes in the personal income tax code in the 2000s.

Figure 2: **Changes in log real annual earnings for selected percentiles of income distribution.**

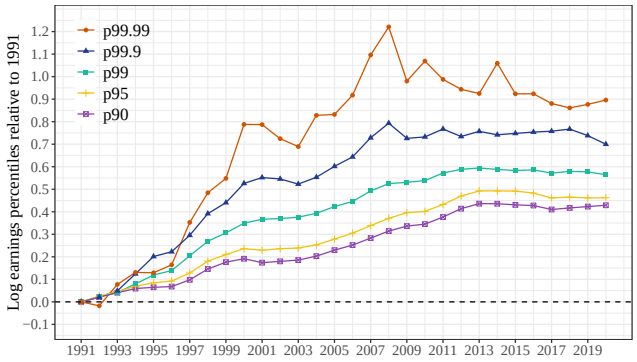
(a) Men: p10-p90



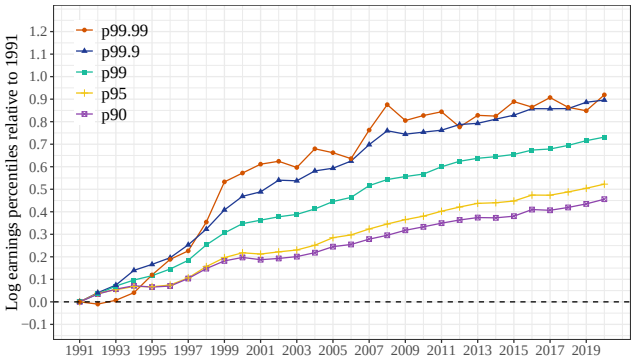
(b) Women: p10-p90



(c) Men: p90-p99.99



(d) Women: p90-p99.99



Note: The figure shows changes in percentiles of log real annual earnings ($\log y_{i,t}$) for men and women over the period from 1991 to 2019 (1991=0). Each percentile line represents a specific point in the earnings distribution, with percentiles normalized to their respective values in 1991. Panels (a) and (b) display the overall earnings distribution for men and women, respectively, from the 10th to the 90th percentiles. Panels (c) and (d) focus on the top of the earnings distribution for men and women, illustrating changes in the 90th, 95th, 99th, 99.9th, and 99.99th percentiles.

Trends in earnings across groups. Figure 2 shows the evolution of selected percentiles in the log real annual earnings distribution for both men and women, normalized to their levels in 1991. Panels (a) and (b) of Figure 2 reveal a general increase in earnings over the period. For instance, median log real earnings in 2015 were 20 log points higher for men and 30 log points higher for women relative to 1991. However, the magnitude of earnings growth varied across the distribution, with significant divergence between percentiles, leading to a widening earnings gap.

As shown in Panel (a), male earnings across percentiles exhibit distinct episodes of divergence, coinciding with key economic events, including the early 1990s recession, the 2000s mining boom, and the post-2008 GFC period. Higher-percentile male earners—such as at p75 and p90—experienced consistently higher earnings growth starting from the early 1990s. In contrast, men in lower earnings percentiles (p10 and p25) experienced greater fluctuations in earnings, with stagnant real earnings until 2003, followed by only modest growth thereafter. This pattern implies that male workers at the lower end of the distribution were disproportionately affected by adverse economic conditions, such as the 1990-91 recession and the 2008 GFC, and exhibited slower post-crisis recoveries.

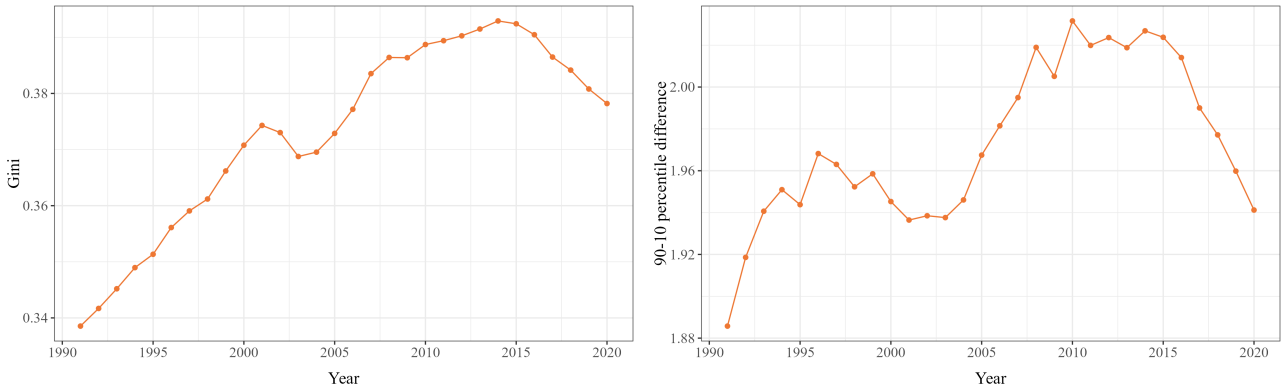
The trends for women present a contrasting story. Panel (b) shows a relatively stronger upward

trajectory for female earnings across all percentiles. Earnings gap among women only became more notable in the upper half of the distribution from the early 2000s. Furthermore, unlike men, women in the lower percentiles (p10 and p25) experienced the highest earnings growth. Their earnings increased by 50 log points over the period, approximately three times the growth rate of men in the same income bracket.

Panels (c) and (d) of Figure 2 display trends within the top decile. For both men and women, the very top percentiles (p99, p99.9, and p99.99) exhibit a steep upward trajectory from the early 1990s onward. This acceleration was more pronounced for men, especially the top 0.01% (p99.99) who experienced substantial growth. Women followed a similar pattern, albeit with less extreme growth at the highest percentiles.

These trends reflect an increasing concentration of earnings at the very top, driving up inequality within the upper echelons of the earnings distribution. However, in the last decade, earnings growth slowed for women and stagnated for men. Peak earnings growth for the male group, especially the very top 0.01%, occurred during the 2000s mining boom and levelled off following the GFC. Among women, growth rates remained steadier across the selected percentiles, though at a slower pace.

Overall, earners in the top 10% saw earnings grow at nearly twice the rate of the rest of the distribution. These results imply widening earnings gaps over time, with pronounced growth at the upper end. These divergent trends highlight an increasing concentration of income among high earners throughout the observed period.



(e) Gini coefficient

(f) P90-P10

Figure 3: **Trends in earnings inequality.**
Note: Gini coefficient (panel a) is calculated on real earnings y_{it}.

Trends in earnings inequality. We now turn to an analysis of earnings inequality over time, using two complementary measures presented in Figure 3. First, we include the Gini index for comparability with broader academic and policy studies. Second, to ensure the robustness of our results across inequality measures, we present the p90-p10 differential—a non-parametric metric that captures the difference between the 90th and 10th percentiles of the log earnings distribution. Additional inequality metrics, such as the standard deviation, are also reported in the subsequent analysis and in Appendix Figure B.1.

The two measures in Figure 3 exhibit consistent patterns, revealing that the evolution of earnings inequality in Australia can be divided into two epochs. In the first epoch, spanning from 1991 to the late 2000s, inequality rose significantly. This was followed by a period of relative stability in the early

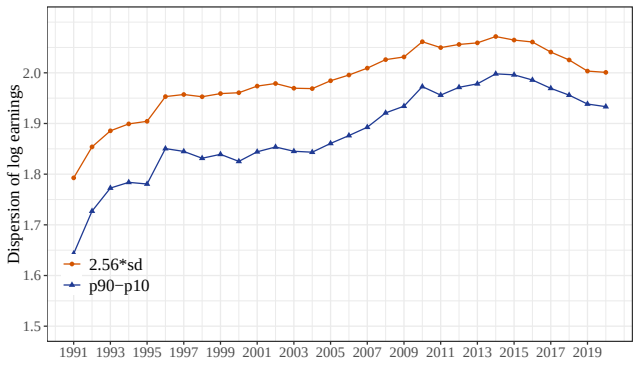
2010s, before inequality declined sharply starting around 2015. This downward trend coincides with the prolonged macroeconomic slowdown that began after the 2008 Global Financial Crisis (GFC).

To understand the underlying drivers of these trends, we refer to Figure 2, which underscores a strong positive correlation between earnings growth rates and income percentiles. During the period of rising inequality, earnings growth was disproportionately concentrated at higher earnings ranks, particularly among the top decile. By the late 2010s, the top 0.1% of earners had experienced growth of up to 100 log points, whereas the bottom of the distribution grew merely 5 log points for men and 20 log points for women. The second phase, marked by declining inequality, aligns with a deceleration in top-end earnings growth. While earnings growth stagnated for top-income men, the rest of the income distribution registered modest gains. Women, in particular, saw the strongest and most consistent growth, whereas men's growth was more gradual and uneven.

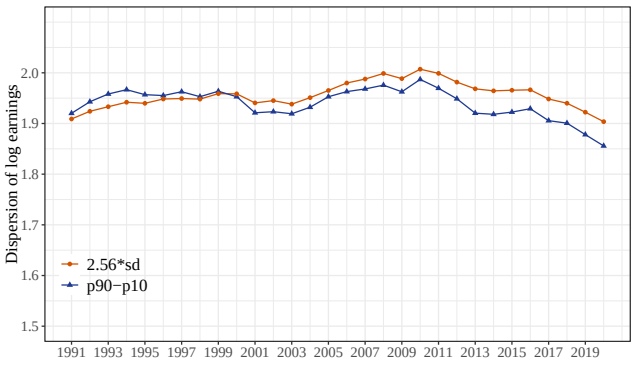
Hence, these findings indicate that the trajectory of earnings inequality in Australia over the past three decades, including the recent reversal, has been largely driven by divergent growth between the top 10% and the lower 90% of earners, alongside strong and sustained earnings gains among women.

Figure 4: **Percentile differential and 2.56 × standard deviation of log earnings.**

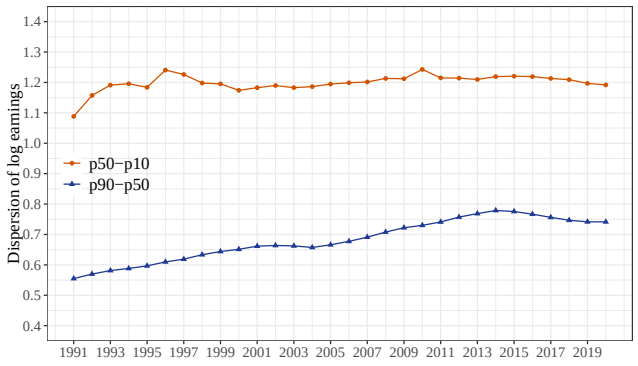
(a) Men



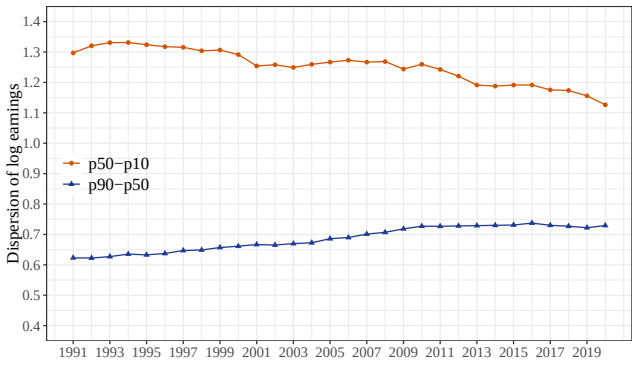
(b) Women



(c) Men: Top/bottom inequality



(d) Women: Top/bottom inequality



Note: This figure shows the dispersion of log real earnings ($\log y_{i,t}$) for men and women from 1991 to 2019. Panels (a) and (b) display overall inequality, measured by the p90-p10 differential and 2.56 times the standard deviation. Panels (c) and (d) focus on inequality within the distribution, using the p90-p50 differential (top-end inequality) and the p50-p10 differential (bottom-end inequality).

The results thus far highlight significant differences in earnings growth paths by gender and income group over the past three decades. For deeper insights, we next analyze inequality trends separately

for men and women and examine how inequality has evolved across different segments of the earnings distribution.

Distinct patterns in earnings inequality by gender. Figure 4 illustrates the dispersion of earnings for both genders. Panels (a) and (b) show trends in two measures of log earnings inequality for men and women, respectively: the p90-p10 differential and the standard deviation, scaled by a factor of 2.56 to correspond to the p90-p10 differential of a Gaussian distribution.

The trends in male and female earnings inequality exhibit distinct patterns, consistent with their earnings trajectories shown in Figure 2. Panel (a) for men demonstrates an upward trend in both inequality metrics until the early 2010s, followed by a decline that returns inequality to its late 2000s level. The rising dispersion during the first two decades underscores widening inequality across the male earnings distribution, primarily driven by stronger earnings growth at the very top relative to the bottom. The subsequent decline reflects stagnant growth rates among top male earners and gradual improvements among low-income men.

In contrast, Panel (b) for women shows a more stable trend in earnings inequality, with only modest fluctuations. The decline in inequality among women that began in the last decade is pronounced, with inequality dropping by around 10 log points between 2010 and 2020. Conversely, the reduction in inequality for men is less consistent over time, amounting to just a 5 log point decrease over the same period. This pattern aligns with the relatively stronger and more uniform growth trajectories among women across earnings percentiles, including in recent years.

Top and bottom-end inequality. For men, Panel (c) shows a relatively stable P50–P10 spread over time, suggesting limited changes in bottom-end inequality. In contrast, the P90–P50 spread increased steadily until around 2010—signalling rising top-end inequality—before declining in the subsequent decade.

To better understand the contributions of different earnings groups to overall inequality trends, we decompose inequality into top and bottom components using the p90-p50 and p50-p10 differentials, respectively. For men, Panel (c) indicates a relatively stable p50-p10 spread, suggesting minimal changes in bottom-end inequality. Meanwhile, the p90-p50 spread increased until 2010, indicating a rising top-end inequality, before falling in the following decade.

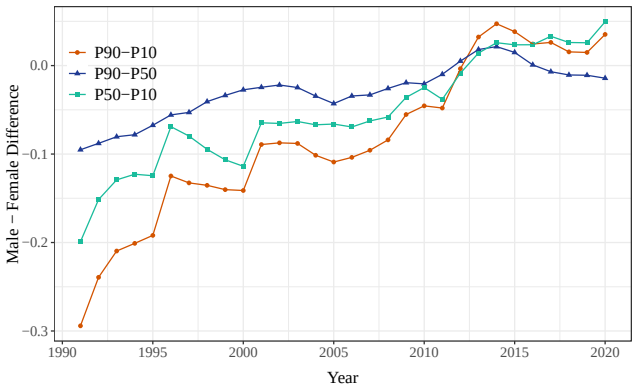
For women, Panel (d) reveals a different pattern. The p50-p10 measure displays a declining trend, reflecting a reduction in bottom-end inequality. In contrast, the p90-p50 measure shows only a modest increase relative to that of men, signaling stability in top-end inequality. These results reinforce earlier findings on female earnings trajectories, indicating that the sustained and robust earnings growth among low-income women, coupled with a slowdown among top female earners, significantly contributed to the decline in overall female earnings inequality.

From these findings, two key takeaways emerge. First, male earnings inequality trends closely mirror the overall inequality patterns, particularly during the first two decades. This suggests that the period of rising inequality in Australia was largely driven by increasing inequality among men—specifically, the expanding disparities in earnings growth between the top 10% and the lower 90% of male earners. Second, while both male and female inequality contributed to the decline in overall inequality during the 2010s, the sharper reduction in female inequality played a more significant role. Faster and consistent earnings growth among women at the lower end of the distribution, combined with stagnation at the top, was a critical factor in driving down overall inequality.

These patterns underscore the heterogeneous impact of economic growth across different segments of the population. It also reflects a unique dynamic in which women, particularly low-income earners, continued to make gains even as broader macroeconomic conditions weakened. However, since our analysis is based on individual earnings data, it remains unclear whether these gains translated into improvements in household welfare or merely offset declines in earnings elsewhere within families—particularly among households whose male earners were at the bottom of the income distribution. Future research utilizing household-level data is needed to assess the extent to which female earnings growth contributes to overall family income stability and to deepen our understanding of intra-household earnings dynamics.

Gender gap in earnings inequality. Figure 5 delves deeper into gender differences in earnings inequality by plotting the gap in dispersion measures—p90-p10, p90-p50, and p50-p10—between men and women. Negative values indicate that the distribution of earnings for women is more dispersed than that for men, reflecting higher earnings inequality for women. In the early 1990s, the p90-p10 measure shows that overall inequality was initially higher for women, but this gap narrowed substantially over time. Notably, there is a convergence in gender differences across all three inequality measures, with values crossing into positive territory in the early 2010s. This shift indicates that, in recent years, earnings inequality has become relatively larger for men. This result aligns with the rising top-end inequality among men and the strong compression at the lower end of the earnings distribution for women. The reversal in the gender gap in earnings inequality is a distinctive Australian feature, setting it apart from other advanced economies (see Figure 4 in Guvenen, Pistaferri and Violante 2022).

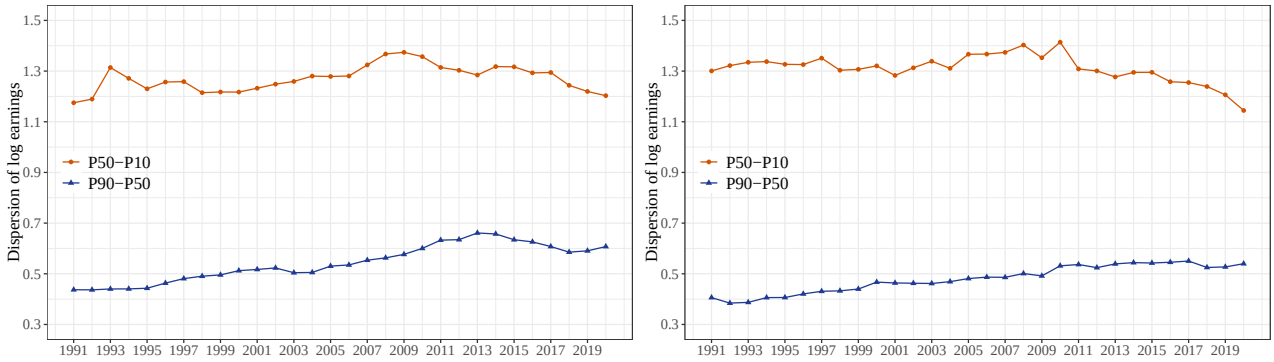
Figure 5: **Trends in gender differences in earnings inequality for log earnings.**



Note: The figure plots the difference between P90-P10, P50-P10 and P90-P50 measures for males and females. A negative value indicates that the respective inequality measure is higher for females than for males and vice versa.

Earnings inequality over the life cycle. The evolution of earnings inequality may stem from differences in labour market conditions over the life cycle. To understand whether overall inequality trends are shaped by initial conditions upon labour market entry, we first examine trends in earnings inequality among 25-year-olds in Australia by gender, focusing on changes at the lower and upper ends of the distribution.

Figure 6: **Initial earnings inequality among 25-year-olds.**



(a) Men (b) Women

Note: This figure shows initial earnings inequality among 25-year-olds from 1991 to 2019, separated by gender. Panels (a) and (b) display the dispersion of log earnings for men and women, respectively, using two measures: the p50-p10 differential (bottom-end inequality) and the p90-p50 differential (top-end inequality). These metrics illustrate differences in initial earnings inequality at various levels of the distribution for young workers over time.

Figure 6 displays the dispersion of initial earnings at age 25 over time, disaggregated by gender. Each panel presents two time series: one for the upper-end inequality (p90-p50) and one for the lower-end inequality (p50-p10). Remarkably, there is virtually no difference between the aggregate inequality patterns shown previously and those observed among young workers.

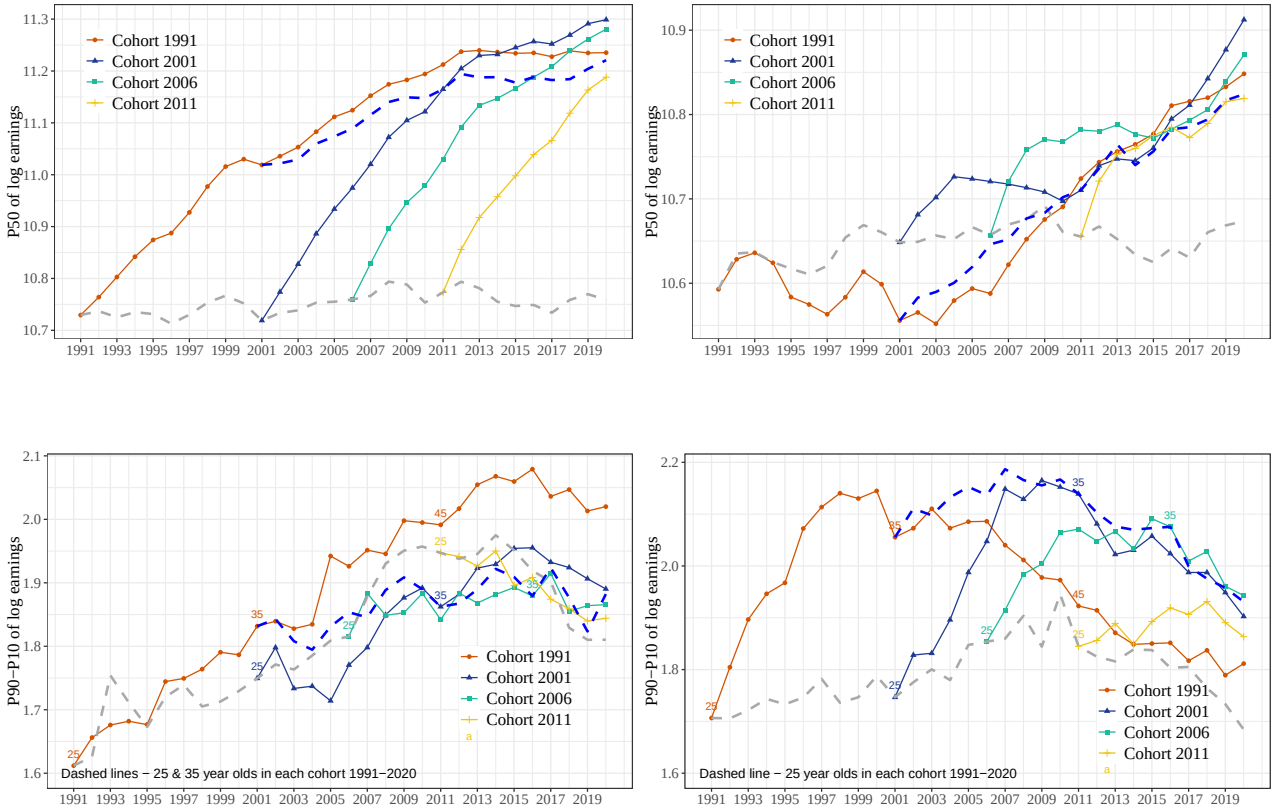
Specifically, Panel (a) shows a modest upward trend in upper-end (p90-p50) dispersion for young men between 1991 and 2013, followed by a slight decline in later years, while lower-end (p50-p10) dispersion remains steady throughout the period. Panel (b) depicts trends for women, illustrating a stronger tendency toward convergence in dispersion between the top and bottom of the earnings distribution. Overall, these findings suggest that the dynamics of aggregate earnings inequality were already present at the early stages of individuals' working lives, indicating a strong role for initial labour market conditions in shaping long-run inequality.

Next, we investigate how initial earnings inequality evolves over the life cycle for different cohorts. Figure 7 traces the evolution of median log earnings (Panels a and b) and the p90-p10 differential (Panels c and d) for 4 different cohorts: workers who turned 25 years old in 1991, 2001, 2006 and 2011. In each panel, the gray and blue dashed lines show the time paths of respective statistics for workers at ages 25 and 35 from 1991 to 2020, respectively. By following cohorts over time, we can disentangle the effects of initial conditions from changes that occur throughout individuals' careers.

Figure 7: **Evolution of of median log earnings and earnings inequality by cohorts.**

(a) Men: Median earnings

(b) Women: Median earnings



(c) Men: Earnings inequality

(d) Women: Earnings inequality

Note: This figure illustrates life-cycle earnings profiles across different cohorts for men and women. Panels (a) and (b) show the median log earnings by age for men and women, respectively, across four cohorts (1991, 2001, 2006, and 2011). Panels (c) and (d) present earnings inequality within each cohort, measured by the p90-p10 differential, for men and women. Dashed lines indicate the ages 25 and 35 for each cohort from 1991 to 2020.

Panel (a) of Figure 7 shows that median earnings for young male workers at age 25 did not improve despite the uninterrupted GDP growth for 30 years. While the older 1991 and 2001 cohorts display lower initial earnings, these differences are minor. Across all cohorts, however, median earnings grow rapidly during the first 10 to 20 years of working life, increasing by 35 to 60 log points before leveling off. For example, the 1991 cohort's median earnings grew by 50 log points over 20 years, plateauing after 2011.

For women, shown in Panel (b), the pattern is markedly different. Unlike their male counterparts, median earnings of 25-year-old women saw modest growth of approximately 7 log points. In contrast, their increases over the life cycle came to only 20 to 30 log points, a relatively slower pace of growth compared to men. Moreover, female earnings growth patterns exhibit greater variation across cohorts. The 1991 and 2001 female cohorts experienced minimal or even negative real earnings growth in their first 10 years in the labour market. Conversely, those in the younger 2006 and 2011 cohorts saw more consistent growth as they aged. Additionally, while periods of earnings stagnation still present for the younger cohorts, these periods cover a significantly shorter time frame. The sluggish initial growth, especially among older female cohorts, likely reflects persistent influence of early-career factors, such as family responsibilities, on female labour supply. Nonetheless, the faster recovery and stronger upward trajectories among younger women may also signal structural changes—such as improved educational

attainment and career opportunities, delayed marriage and childbearing, evolving household dynamics, more flexible work arrangements, and strengthened policy support for working women.

Panels (c) and (d) of Figure 7 show how earnings inequality—measured by the P90–P10 differential—evolves over the life cycle, highlighting both gender-specific patterns and shared cohort dynamics. Specifically, the older 1991 and 2001 cohorts display different inequality trajectories by gender. For men, earnings inequality rises steadily throughout the early and mid-career stages, suggesting that factors such as seniority, experience, and career-related shocks contributed significantly to widening initial disparities. In contrast, women in the same cohorts follow a hump-shaped trajectory. As shown in Panel (d), earnings inequality among women peaks around age 34—approximately a decade into their careers—before declining thereafter. This pattern implies that life-cycle inequality for women is more variable and subject to reversal, potentially reflecting influences such as occupational sorting, career interruptions related to childbearing or caregiving, and structural barriers like the glass ceiling. These dynamics stand in contrast to the more persistent, monotonic rise in inequality observed among older male cohorts.

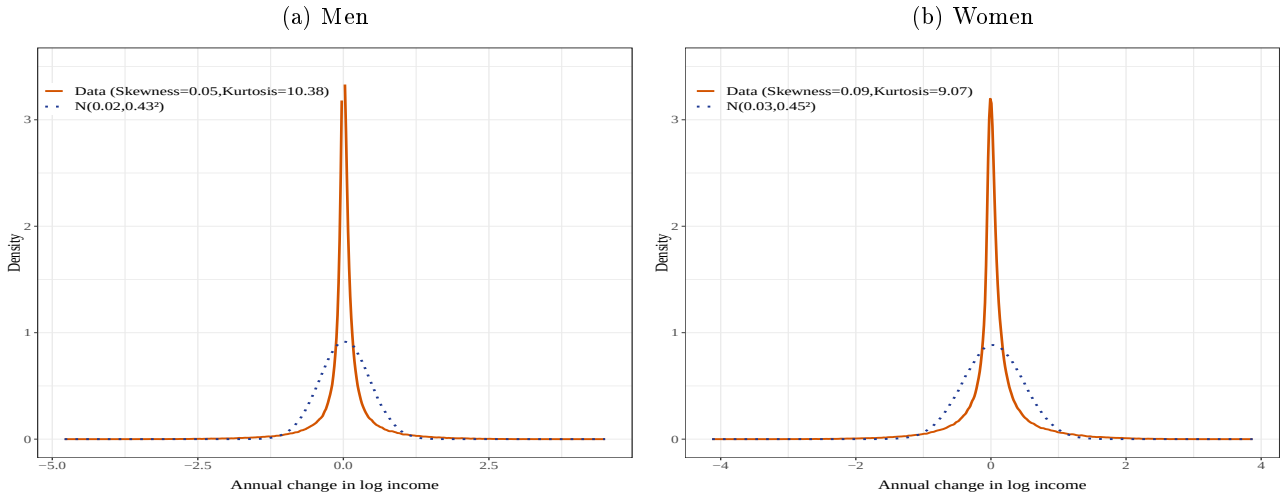
On the other hand, the younger cohorts who entered the labour market in 2006 and 2011 exhibit a markedly different pattern compared to their predecessors. For both men and women, initial inequality at age 25 was either stable or declining, and subsequent changes in inequality over the observed life cycle were relatively modest. That is, the steep increases in dispersion characteristic of earlier cohorts are largely absent among these younger workers. This consistent pattern across genders and across both initial and life-cycle dispersion points to a broader macroeconomic shift. In particular, the prolonged post-GFC slowdown of the 2010s appears to have dampened both the inequality present at labour market entry and the accumulation of inequality over time. In other words, for younger cohorts, adult income shocks—such as those arising from promotions, industry transitions, or differential returns to experience and seniority—play a diminished role in shaping lifetime earnings inequality. Instead, disparities rooted in early-life conditions—such as educational attainment, cognitive and non-cognitive skills, and parental background—are increasingly decisive in determining long-term outcomes.

This shift signals a rise in persistent, early-life inequality and carries important implications for intergenerational mobility and labour market policy in Australia. In particular, the findings point to the value of further research into policies that support more equitable foundations at the start of individuals' working lives, including education and family support policies, to mitigate the long-term consequences of entrenched inequality.

3.2 Earnings dynamics

In this section, we examine key properties of the distribution of residualized earnings growth, focusing on its second- and higher-order moments. While the distribution of earnings levels provides insights into the cross-sectional dispersion (inequality), the distribution of residualized earnings growth/changes—which removes age effects related to experience, seniority, and work hour variations over the life cycle—offers a deeper understanding of how earnings evolves for the same individuals over time. These changes, referred to as shocks, serve as proxies for *idiosyncratic earnings risk*. Negative shocks represent declines due to idiosyncratic factors unrelated to age, while positive shocks indicate the opposite. Therefore, its moment properties are crucial for understanding earnings dynamics.

Figure 8: **Empirical vs. Gaussian density of one-year changes in residualized log earnings by gender**.



To explore these properties, we compute the density of 1-year changes in residualized log earnings (or 1-year earnings shocks), as reported in Figure 8. The standard deviation is 0.43 for men and 0.45 for women, indicating a slightly higher earnings shock volatility for women. These values are comparable to estimates for Sweden and Spain, as well as to findings based on Australian household survey data (HILDA) by Tin and Tran (2023), but they are lower than the average values reported in the cross-country sample of Guvenen, Pistaferri and Violante (2022).

If earnings shocks followed a Gaussian (normal) distribution, approximately 68% of annual shocks would fall within ±0.43 log points for men and ±0.45 log points for women, implying that most earners experience annual earnings shocks in the range of 50-60%. However, the empirical distribution of residualized log earnings growth deviates significantly from normality. As demonstrated in Figure 8, relative to a Gaussian distribution of identical mean and standard deviation, the empirical distribution exhibits three distinct features: (i) a very sharp peak, representing a much larger probability of small shocks; (ii) thin shoulders, indicating a significantly lower probability of moderate shocks; and longer and thicker tails, revealing a greater likelihood of extreme shocks compared to a Gaussian distribution.

To quantify these deviations, we compute higher-order moments of the 1-year earnings shock distribution, including Kelly skewness and Crow-Siddiqui kurtosis.[9] Our results reveal that the distribution displays positive (right) skewness, excess (leptokurtic) kurtosis, and thick double Pareto tails. The peakedness and thick tails are reflected in a very high kurtosis in excess of 10.38 for men and 9.07 for women, relative to 3 for a Gaussian distribution.

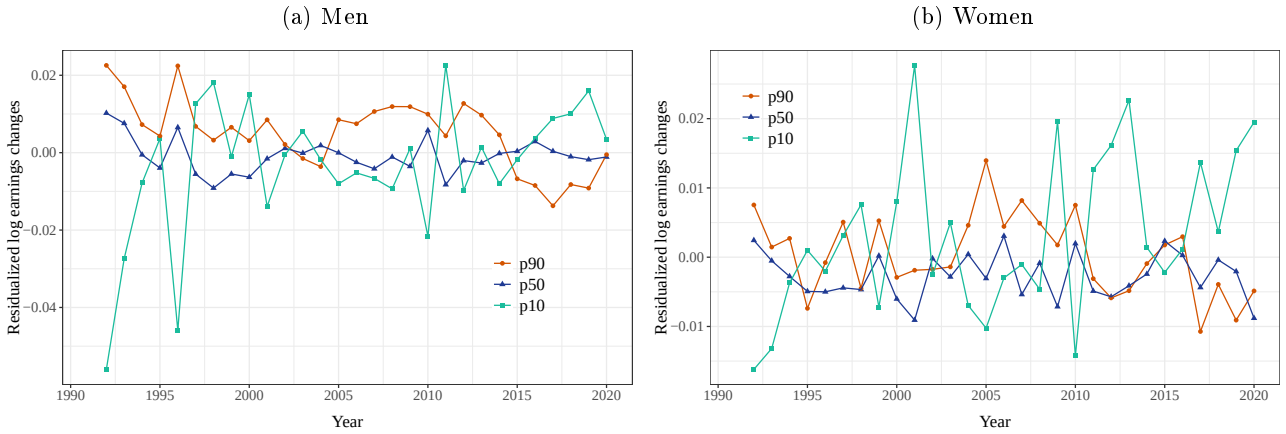
These empirical properties are broadly consistent with prior findings. Similar distributional shapes—characterized by peaked centres, skewed and fat tails—have been documented in Australia by Tin and Tran (2023), in the US by Guvenen et al. (2021), and across a wide range of countries in Guvenen, Pistaferri and Violante (2022).

[9]Note that, Kelly skewness measures asymmetry in the distribution, with positive values indicating a rightly-skewed distribution (larger extreme positive changes than extreme negative changes). Crow-Siddiqui kurtosis measures the "tailedness" of the distribution, with higher values indicating a greater frequency of extreme earnings changes.

3.2.1 Earnings shocks over time

We begin by examining how average shocks evolve over time. Figure 9 illustrates the one-year change in residualized log earnings for men (left panel) and women (right panel) across different percentiles of the income distribution, highlighting notable differences in earnings dynamics by income level and gender.

Figure 9: **Average one-year changes in residualized log earnings for selected percentiles of the income distribution.**



Note: Residualized log earnings ε_{it} change is given by $\triangle\varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$.

In particular, average earnings shocks for low earners (p10) display substantial volatility throughout the period for both men and women, indicating greater earnings risk at the lower end of the distribution. In contrast, median earners (p50) experience relatively modest and stable year-over-year shocks, reflecting more consistent earnings trajectories. High earners (p90), especially among men, generally experience positive earnings shocks up to 2015, consistent with their strong average earnings growth during this period.

These patterns suggest that the earnings growth observed at the top of the distribution—central to rising inequality in Australia—is not primarily driven by life-cycle factors such as experience accumulation or changes in work hours. Rather, it reflects idiosyncratic or structural factors beyond those typically associated with age-related trends.

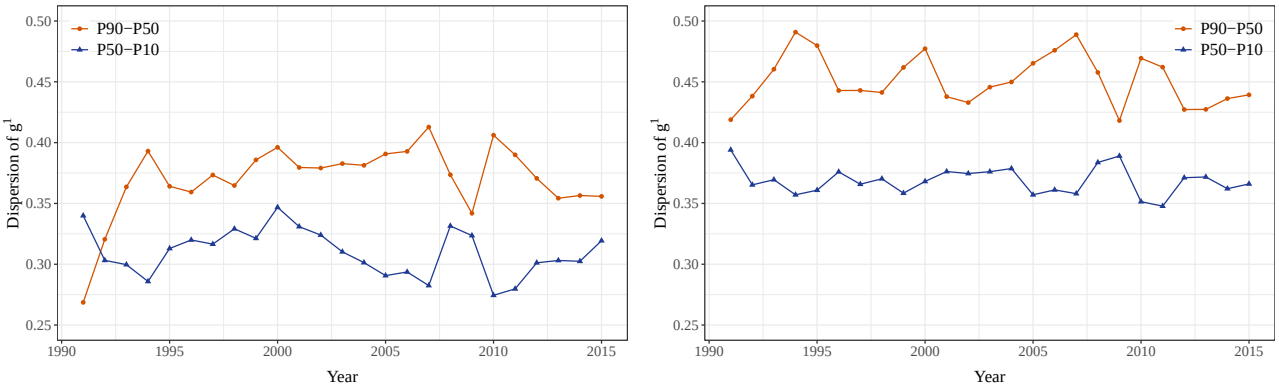
Moreover, although average earnings shocks fluctuate over time, the magnitude of these fluctuations in Australia is considerably smaller than in comparable countries in the GRID database, including Canada, Mexico, Spain, and Argentina. This indicates that average earnings shock in Australia is comparatively low.

Cyclical features. Figure 10 presents the dispersion of one-year growth in residualized log earnings (one-year earnings shocks) for men and women in Australia, measured by the upper-end (p90-p50) and lower-end (p50-p10) percentile differences. First, earnings shocks exhibit greater dispersion among higher-income earners (p90-p50) across both genders. Women, however, experience higher shock volatility compared to men. Furthermore, we find that the volatility of earnings shocks in Australia has

remained relatively unchanged over time across both the upper and lower segments of the distribution and for both men and women. The persistence of this stability of earnings shock volatility—a key feature of idiosyncratic earnings risk—implies that individual earnings shocks have not become more volatile over time, despite broader macroeconomic changes. Moreover, it suggests a more predictable earnings trajectory for workers throughout the period.

Second, while earnings shock volatility remains relatively stable over time, it follows a noteworthy pattern. The lower-end (p50-p10) dispersion is countercyclical, spiking during the early 1990s recession and the 2008 GFC, whereas the upper-end (p90-p50) dispersion is procyclical. This suggests that even when aggregate indicators, such as GDP growth, remain positive during economic downturns, earnings risk—particularly for the lower-end of the earnings distribution—heightens. Given their greater dependence on labour earnings and limited financial buffers, lower-income individuals are thus disproportionately exposed to macroeconomic shocks—exposures that may not be apparent when examining earnings levels in isolation.

Figure 10: **Dispersion of one-year changes in residualized log earnings by gender.**



(a) Men (b) Women

Note: This figure displays the dispersion of one-year changes in residualized log earnings for men and women from 1990 to 2015. Panel (a) shows the dispersion for men, while panel (b) shows the dispersion for women. The p90-p50 and p50-p10 differentials measure earnings volatility at different parts of the distribution, with the p90-p50 capturing upper-end dispersion and the p50-p10 focusing on lower-end dispersion.

Next, we turn to the higher-order moments of earnings shocks. Figure 11 presents the dynamics of Kelley skewness and Crow-Siddiqui kurtosis of one-year residualized changes in log earnings, disaggregated by gender.

Figure 11: **Higher-order moments (skewness and kurtosis) of one-year changes in log earnings by gender.**

Note: This figure shows the higher-order moments in one-year changes in residualized log earnings by gender from 1990 to 2015, measured through Kelley skewness and excess Crow-Siddiqui kurtosis. Panel (a) presents Kelley skewness, which reflects the asymmetry in earnings changes, with a positive value indicating a skew towards larger positive changes. Panel (b) displays Excess Crow-Siddiqui kurtosis where we subtract 2.91 from the Kurtosis metric. Kurtosis measures the "tailedness" of a probability distribution compared to a normal distribution, which has a kurtosis of 3. A kurtosis value of 2.91 means the distribution is slightly less peaked and has slightly thinner tails than a normal distribution.

Panel (a) of Figure 11 shows that Kelley skewness exhibits notable fluctuations for both men and women, with periods of positive skewness reflecting years when extreme positive earnings shocks were more pronounced than extreme negative ones. During economic slowdowns, the distribution becomes more negatively skewed, reflecting an increase in the magnitude of extreme negative shocks relative to extreme positive shocks. Conversely, during economic recoveries and expansions, the magnitude of extreme positive shocks rises relative to negative ones. Notably, despite the marked gender differences in shock dispersion, the levels and trends of Kelley skewness are similar between men and women.

Panel (b) of Figure 11 illustrates Crow-Siddiqui kurtosis, which remains consistently high for both men and women, well above the level associated with a normal distribution. This indicates the presence of heavy tails and thus a significant probability of extreme earnings shocks. Men have higher kurtosis than women throughout the period, suggesting they face greater exposure to extreme shocks. Importantly, following the early 1990s recession, kurtosis declined for the remainder of the decade. This leads to a relatively stable kurtosis at a lower level, especially for women. However, in the aftermath of the 2008 GFC, we observe a rise in kurtosis back to its mid-1990s levels, suggesting a renewed increase in the frequency of extreme earning shocks.

Overall, our findings highlight the persistent asymmetry and heavy-tailed nature of the earnings shock distribution. Although there are some noteworthy cyclical and gender-specific variations, the key moment properties of —earnings shock distribution—namely, its dispersion, skewness, and kurtosis—have remained largely unchanged over the past three decades, reflecting the persistent nature of idiosyncratic earnings risk.

3.2.2 Earnings shocks by rank and age

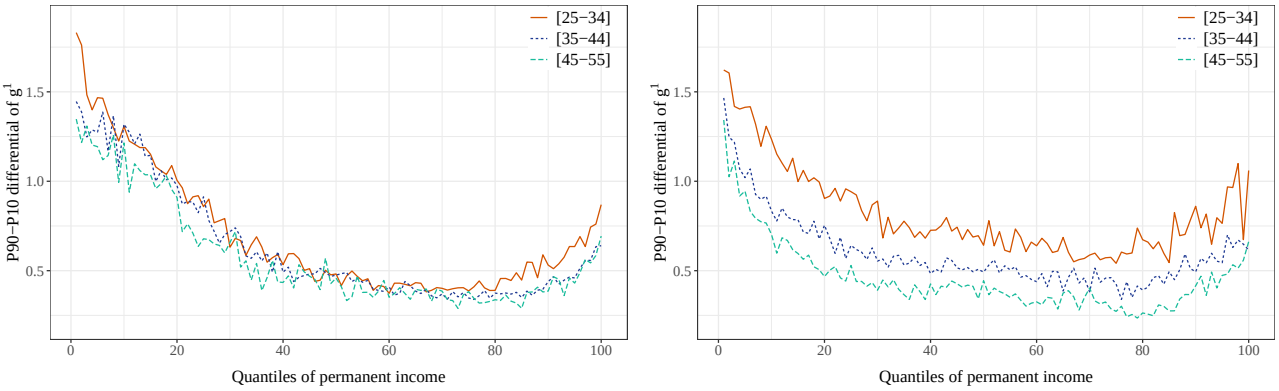
We now explore the second- and higher-order moments of one-year changes in residualized log earnings, disaggregated by age, earnings rank, and gender. This analysis allows us to investigate how the dispersion, asymmetry, and extremity of earnings shocks vary across different stages of the life cycle

and positions in the earnings distribution for both men and women.

Figure 12: **Dispersion, Kelley Skewness and Crow-Siddiqui Kurtosis of one-year changes in log earnings by age group, permanent earnings percentiles, and gender.**

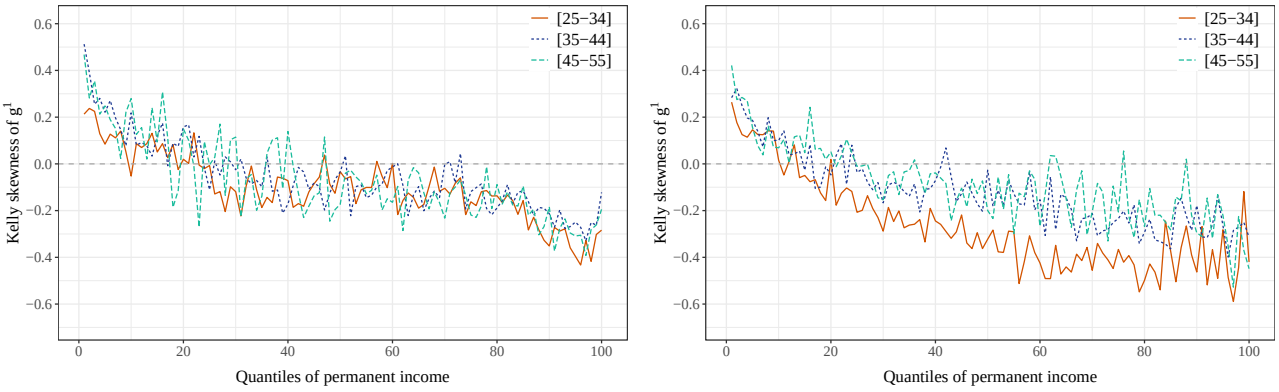
(a) Men: P90-P10

(b) Women: P90-P10



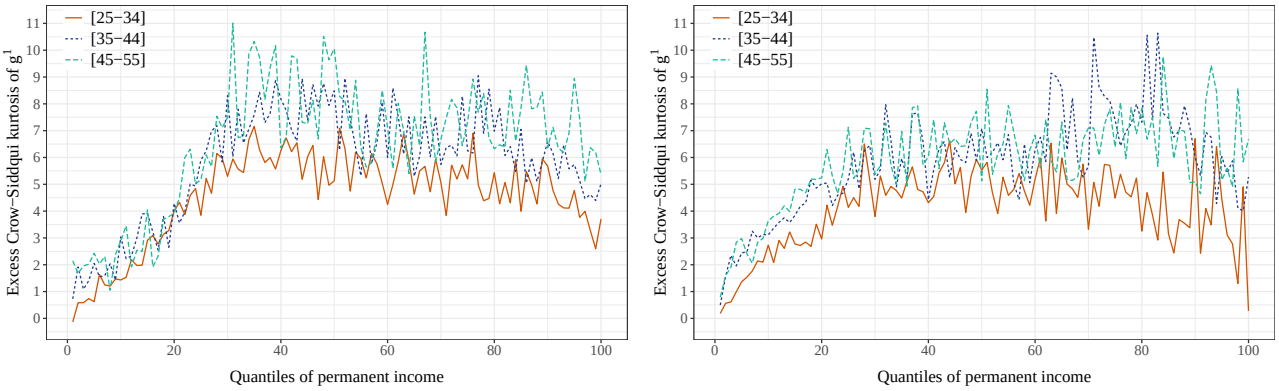
(c) Men: Kelly Skewness

(d) Women: Kelly Skewness



(e) Men: Kurtosis

(f) Women: Kurtosis



Note: This figure illustrates the dispersion, Kelley skewness, and Crow-Siddiqui kurtosis of one-year changes in log earnings, segmented by age group (25–34, 35–44, 45–55), permanent earnings percentiles, and gender. Panels (a) and (b) show the p90-p10 differential, representing overall dispersion across income quantiles, for men and women, respectively. Panels (c) and (d) display Kelley skewness, indicating the asymmetry in earnings changes, where positive values reflect a skew toward larger extreme positive changes. Panels (e) and (f) show excess Crow-Siddiqui kurtosis, capturing the "tailedness" or frequency of extreme earnings changes.

Figure 12 presents these dynamics. We divide workers into three age categories: 25–34, 35–44, and 45–55 years. Within each age group, we further stratify individuals by gender and permanent earnings rank (i.e., percentiles of average earnings over the preceding three years). The top panels (a) and (b)

report the dispersion of one-year earnings shocks, measured by the p90-p10 differential, for men and women, respectively. The middle and bottom panels illustrate the higher-order moments. Specifically, Panels (c) and (d) show Kelley skewness, capturing the asymmetry of the shock distribution. Panels (e) and (f) depict Crow-Siddiqui kurtosis, measuring the thickness of the tails in the distribution.

Volatility. We begin with volatility, the second moment. From Panels (a) and (b) of Figure 12, three significant findings emerge.

First, the dispersion of earnings shocks decreases with age for both men and women. Younger workers (25–34) experience higher shock volatility across all earnings levels, with the p90-p10 differential gradually narrowing for older age groups. This pattern of declining volatility with age may be a result of labour market churning—such as part-time or casual employment, career/job switching, and transitions between education and work—that is more common among younger workers. As they age, their earnings growth becomes increasingly stable, especially within the lower and middle segments of the permanent earnings distribution.

Second, both panels reveal a U-shaped pattern in earnings shock dispersion across permanent income quantiles, irrespective of age. Dispersion is greatest at the lower quantiles, decreases gradually as one moves up the permanent income rank, but rises sharply again at the top quantiles, particularly beyond the 95th percentile. This pattern indicates that earnings shocks are more volatile for both low- and top-income earners, with the bottom experiencing the most pronounced increase. Evidence from Tin and Tran (2023) suggests both work hours and wages play almost equally important role in explaining the higher fluctuations at the lower end, pointing to the dominance of part-time and casual work within this earnings range as a significant contributor. Conversely, at the top, they reveal that wage dispersion, rather than hours worked, is the primary driver of shock dispersion.[10]

Third, while the overall patterns are similar across genders, men display slightly higher dispersion at the bottom of the permanent earnings distribution, regardless of age group. In other words, low-income male workers are exposed to larger earnings shock volatility compared to their female counterparts, highlighting a gender difference in earnings stability among the lowest earners. One potential reason is sectoral composition: low-income male workers are spread across different industries, including manufacturing and construction that are more prone to economic shocks, whereas low-income female workers are more concentrated in the service sector. On the contrary, young and middle-aged women in the median and upper permanent income quadrants experience higher dispersion than their male counterparts. This likely reflects the impact of maternal responsibilities, which may lead to career interruptions, employment gaps, or part-time transitions—therefore increasing earnings shock volatility.

Skewness. We now turn to skewness, the third moment. Panels (c) and (d) of Figure 12 display Kelley skewness for one-year earnings shocks. Despite the positive skewness for the overall distribution, as reported in Figure 8, both panels show consistently negative skewness for individuals with permanent income ranks above the 30th percentile. This demonstrates that higher-income earners face experience larger extreme negative shocks compared to positive ones. In contrast, low-income earners face more extreme positive shocks, aligning with the strong upward income mobility observed in the subsequent Subsection 3.3. This asymmetry may also arise from structural constraints: low

[10] See Figures 2 and 3 in Tin and Tran (2023) and Figure D.1 in their online technical appendix.

income earners are closer to the income floor, giving them more room for upward than downward movements.

Additionally, there are gender differences. Panel (c) shows that for men, Kelley skewness is close to zero, especially around the median of the permanent earnings distribution, indicating a more symmetric distribution of earnings shocks. In other words, across age groups, the distribution of one-year earnings shocks for men tends to be fairly balanced between positive and negative shocks. In contrast, Panel (d) reveals more variability in Kelley skewness for women, both across the earnings distribution and over the life cycle. Higher-income women generally experience greater negative skewness compared to their male counterparts. Moreover, younger women (25–34) exhibit the most pronounced decline in skewness, revealing that this group faces the most extreme downward shocks. This pattern is likely explained by life events such as marriage and parental duties that disproportionately affect women in early to mid-career stages.

These findings highlight a more consistent and symmetric distribution of earnings shocks for men, whereas women experience greater variability in skewness, especially at higher earning levels and younger ages. This indicates that idiosyncratic factors contribute to more uneven earnings changes for women compared to men.

Kurtosis. Panels (e) and (f) of Figure 12 present Crow-Siddiqui kurtosis for one-year earnings shocks. The results illustrate that excess kurtosis increases sharply across the lower segment of the permanent earnings distribution, before stabilizing around the 30th percentile for both men and women. This pattern implies that the distribution of earnings shocks deviates further from normality (where kurtosis is 3) at higher income levels. In other words, higher-income earners face a greater likelihood of extreme earnings shocks. When viewed alongside the skewness results, these findings suggest an important asymmetry. While low-income earners experience relatively larger extreme positive shocks, such occurrences are rare. Conversely, higher-income earners are more frequently exposed to extreme negative shocks.

Moreover, Panels (e) and (f) also show that older workers, regardless of gender or permanent income rank, exhibit higher kurtosis than younger workers. This suggests that the frequency of extreme earnings shocks rises over the life cycle, which may be the result of health-related work hour reductions, early retirement, or other career transitions near retirement. The presence of fatter tails at older ages reinforces the importance of accounting for life-cycle risks when evaluating earnings dynamics in ageing populations.

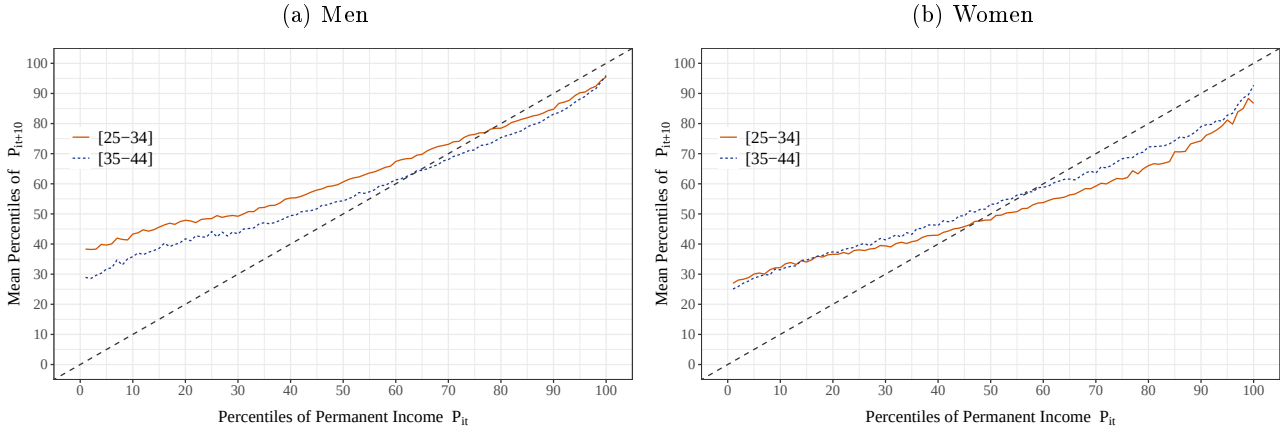
3.3 Earnings mobility

To examine how earnings dynamics affect earnings mobility over the life cycle, we analyze the average rank-rank mobility of permanent earnings over a 10-year period. Overall, we find that the earnings dynamics of the lower permanent income ranks, as observed in the previous analyses, are positively correlated with mobility. In particular, consistent earnings growth, relatively higher dispersion, positive skewness, and lower kurtosis among the lower quantiles of the permanent income distribution are associated with strong upward mobility.

Figure 13 depicts the average rank of permanent earnings in period $t+10$ as a function of permanent earnings in period t, based on annual averages for three age groups of men and women from 1997 to

2007.[11]

Figure 13: **10-year average rank mobility (Averages of 1997-2007).**



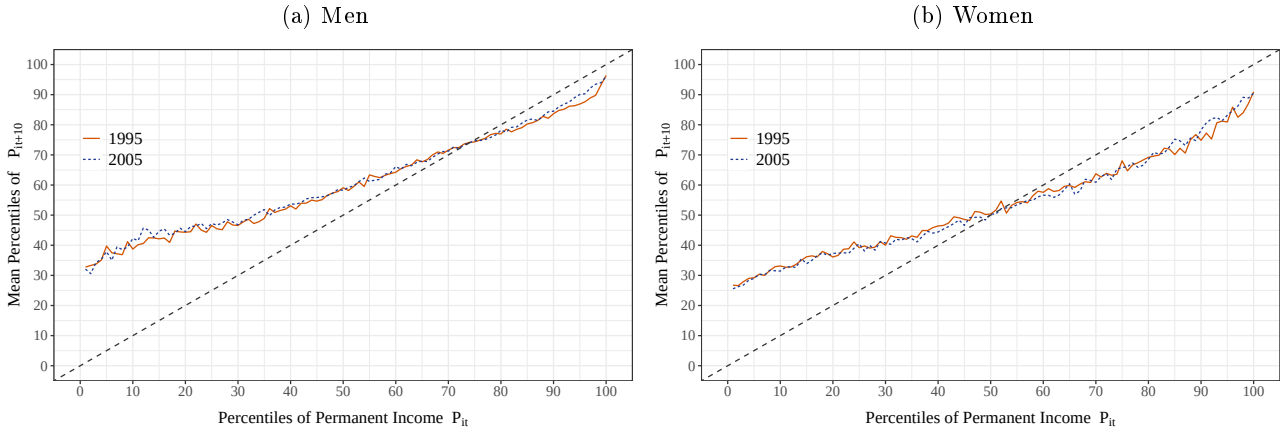
Note: This figure shows the 10-year average rank mobility for men and women, based on averages from 1997 to 2007. Panel (a) illustrates the mobility for men, while panel (b) shows the mobility for women, across two age groups: 25–34 and 35–44. The y-axis represents the mean percentile rank ten years later, while the x-axis shows the initial percentile rank in the permanent income distribution. The 45-degree line represents perfect mobility, where initial rank equals rank ten years later. This graph highlights the persistence of income ranks over time, with younger workers (25–34) showing slightly higher upward mobility than their older counterparts.

Panel (a) of Figure 13 shows that men experience strong upward mobility at the lower end of the permanent earnings distribution, with young men (25–34) achieving higher mobility than those aged 35–44. For instance, on average, men initially in the 10th percentile rise to the 40th percentile after ten years. Overall, male mobility path is fairly linear, and upward mobility at the lower end of the distribution is significantly stronger than downward mobility at the upper end. This results in a rank-rank trajectory that crosses the 45-degree line at the upper percentiles—around p75 for men aged 25–34 and p65 for those aged 35–44.

Panel (b) illustrates a similar pattern of upward mobility for women, but with three key differences. First, women's mobility is weaker overall: women starting in the 10th percentile reach, on average, only the 30th percentile after ten years. Second, unlike men, older women (35–44) exhibit higher mobility than younger women (25–34), except at the lower end of the permanent income rank. This pattern aligns with women's life cycle earnings trends reported in Figure 7, where younger women experienced stagnating or declining earnings in their early careers. Lastly, the rank-rank mobility profile for women is flatter, passing through the 45-degree line at approximately the median of permanent income. This suggests a more symmetric 10-year average mobility pattern compared to that for men, with lower upward mobility at the bottom and higher downward mobility at the top of the distribution. For instance, on average, a woman in the 90th percentile drops to the 75th percentile after ten years, whereas her male counterpart moves only slightly to the 85th percentile, remaining closer to his original rank. Thus, despite sustained female earnings growth outpacing male earnings growth over the past three decades, our findings suggest that women remain less mobile in relative terms.

[11] Results for individual years reflect a similar pattern.

Figure 14: **10-year average rank mobility over time - 1995 and 2005**



Note: This figure illustrates 10-year average rank mobility over time for men and women, comparing the years 1995 and 2005. Panel (a) shows mobility for men, and panel (b) shows mobility for women. The similarity between the 1995 and 2005 lines suggests stable rank mobility over time, with minimal variation in upward or downward mobility across these periods for both genders.

Figure 14 further examines 10-year average rank mobility by gender across two time periods—1995 to 2005 (indexed as 1995) and 2005 to 2015 (indexed as 2005). The close alignment of mobility profiles between these periods, for both men and women, indicates a remarkable stability in earnings mobility over time. That is, despite shifts in the broader economic landscape over the past 30 years, the extent of upward and downward movement over the earnings ranks has remained largely unchanged.

Additionally, our results are robust to the time horizon considered. The 5-year rank-rank mobility measures closely track the 10-year profiles, differing by only about five percentile points across the distribution (see Appendix Figure [fig:5-year-average-rank-1995and2005]). For example, men beginning in the 25th percentile are expected to reach the 50th percentile within ten years, and according to the 5-year measure, they already reach the 45th percentile halfway through. This provides further evidence of Australia's relatively strong and persistent upward mobility.

Our analysis of 10-year mobility aligns with the rest of the GRID projects, facilitating cross-country comparability. Importantly, the rank-rank measure crosses the 45-degree line at significantly higher percentiles—at the 70th percentile for men and the 50th percentile for women—compared to the US, UK, and Canada. This implies that long-run upward mobility in Australia was significantly stronger during the period of uninterrupted economic growth. Moreover, our results are robust to the time horizon considered. The 5-year rank-rank mobility measures closely mirror the 10-year figures, differing by only around 5 percentile points across the permanent income percentiles (see Figure B.4 in Appendix). For instance, men starting in the 25th percentile can expect to reach the median within a decade, and according to the 5-year rank-rank measure, they typically attain the 45th percentile halfway through. This reveals that earnings mobility is not a linear function of time and provides further evidence of Australia's relatively strong upward mobility.

4 Extension: Market and post-government income

In this section, we extend our analysis to consider the broader income measures, including market income and post-government income. Market income is defined as the sum of labour and capital earnings/income, while post-government income incorporates taxes and transfers into market income.

This extension helps distinguish between inequality and risk driven by market forces and those mitigated through the tax and transfer system. We adopt the same data selection and methodology as in the main analysis and provide a summary of the core findings below. Additional details are available in the Appendix.

4.1 Market income

We begin with market income. Overall, our core statistics show that trends in market income closely resemble those of labour earnings, with only minimal deviations.

Growth and Inequality. Figure C.1 shows that log market income growth paths are nearly identical to those of log labour earnings in Figure 2. This suggests that capital income contributes little additional growth volatility, and that the market income path is almost entirely driven by labour earnings. While market income inequality is generally lower than labour earnings inequality, the inequality patterns by gender and income groups remain stable, implying that capital income neither amplifies nor dampens the underlying dynamics of earnings inequality observed in Australia.

Dynamics. Higher-order moment analyses in Figures C.4 and C.5 reinforce the above result. There is no significant difference in volatility, skewness, or kurtosis between labour earnings shocks and market income shocks. Thus, the idiosyncratic risks associated with labour market dynamics largely carries over into market income.

Mobility. Average rank-rank mobility measures for both labour earnings and market income are consistent across age groups and years. This shows that market income mobility is primarily driven by labour income mobility, with capital income playing a negligible role.

In summary, these findings suggest that capital income is not a major driver of market income inequality, dynamics, or mobility in Australia. This may reflect a potentially unique characteristic of the Australian income distribution, where labour earnings play a more dominant role in shaping lifetime income trajectories.

4.2 Post-government income

Turning to post-government income, the analysis reveals important differences compared to labour earnings. While the patterns of inequality, risk, and mobility are generally aligned with those observed for labour earnings, there are noticeable changes in the levels of these statistics, reflecting the redistributive effects of the tax and transfer system in Australia.

Growth and Inequality. Figure C.10 shows that post-government income growth rates for earners between the 10th and 90th percentiles are similar to labour earnings growth. However, top-income earners (p90 to p99.99) face lower or more compressed growth trajectories for post-government income, mainly due to progressive taxation. Nonetheless, even after accounting for taxes and transfers, top-end income growth remains generally higher than the rest of the distribution.

A comparison of Figures 4 and C.11 confirms that post-government income inequality is lower than labour earnings inequality, especially at the lower end of the distribution (p50-p10). This finding demonstrates the effect of targeted transfers and a relatively high tax progressivity in Australia in

narrowing income gaps among low-income earners. However, the overall pattern of inequality remains largely unchanged, suggesting that while redistributive policies reduce the magnitude of inequality, they do not fundamentally alter the underlying inequality dynamics driven by labour earnings.

Dynamics. Comparing Figures 12 and C.14 reveals a moderate decline in the dispersion of income shocks among lower-income earners after accounting for taxes and transfers. It suggests that the tax and transfer system provides insurance against income volatility, with the most significant impact on low-income groups. Additionally, for women, post-government income shock volatility across the permanent income distribution is lower than that of their labour earnings, with notable impact on younger women. However, the effects on higher-order risk measures (skewness and kurtosis) are minimal, indicating that while redistribution reduces income volatility, it is not effective in mitigating the severity or frequency of extreme income shocks. These findings resonate with Tin and Tran (2023), who showed that the government plays a greater role in stabilizing income volatility, whereas extreme events are more often cushioned through family-level income pooling mechanisms.

Mobility. Rank-rank mobility patterns for post-government income closely mirror those observed for labour earnings. The overall structure of mobility remains intact, with no notable shift in the intersection points between the mobility profiles and the 45-degree line. Thus, while redistributive policies compress income growth at the top and reduce volatility and inequality at the bottom, this finding suggests that they do not significantly alter long-term income mobility.

5 Conclusion

In this paper, we provide a comprehensive analysis of earnings inequality, dynamics, and mobility in Australia during its three decades of sustained economic growth from 1991 to 2020, using administrative tax data. Our findings reveal important insights into how earnings levels and shocks evolved in the context of a sustained macroeconomic expansion.

First, we identify the implications of economic growth for earnings inequality trends. From 1991 to 2008, a period marked by favourable macroeconomic conditions, rising inequality was driven by strong earnings growth at the top end of the earnings distribution, especially among men. In contrast, the 2010s, characterized by economic slowdowns, witnessed a deceleration in top-end growth and a reversal of the gender gap due to the sustained and robust growth among women at the lower end of the distribution. Together, these forces contributed to a reduction in overall inequality in the final decade. However, a notable concern is the persistent stagnation in earnings among low-income men, who appear to have been left behind during this period of structural change.

Second, our analysis shows an increasing importance of initial conditions—such as education, parental background, and early-life opportunities—in shaping lifetime inequality, particularly for younger cohorts. Since around 2010, adult income shocks have played a diminishing role in driving inequality in over the life cycle, indicating a shift toward more persistent early-life disparities in Australia. This transition, which occurred during the economic slowdown period, suggests that in a low-growth environment, interventions focusing on early-life support and education may be more effective in reducing later-life inequality.

Third, the overall earnings shock distribution—which captures idiosyncratic risk—is characterized by positive skewness, excess kurtosis, and heavy tails, with heightened volatility for low-income earn-

ers. These moments are relatively stable over time but exhibit cyclicality. During periods of economic slowdown, shock volatility rises at the lower end of the income distribution, and extreme negative shocks become more frequent and severe. Moreover, we find that idiosyncratic earnings risk remains persistent across socioeconomic and demographic groups, with low-income workers and women still facing greater earnings risk. These findings highlight the importance of targeted policy interventions to help mitigate adverse shocks among vulnerable populations.

Fourth, our analysis of earnings mobility reveals strong and stable upward mobility during Australia's extended growth period, with mobility rates exceeding those of many other advanced economies. However, women generally experience lower mobility than men. Lastly, while fiscal policies—through taxes and transfers—effectively reduce inequality and buffer income volatility at the bottom of the distribution, they do not significantly alter the broader patterns of earnings inequality and dynamics. This suggests that market forces still play the dominant role in shaping the evolution of earnings over time.

Overall, our findings enhance the understanding of how a favorable macroeconomic environment shape earnings inequality, dynamics, and mobility at the individual level. To provide a more comprehensive view of household economic well-being in Australia, future research should examine the dynamics of income and consumption distributions at the family level and develop a structural model to assess the effectiveness of policy interventions in mitigating earnings risk for vulnerable households.

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Appendix

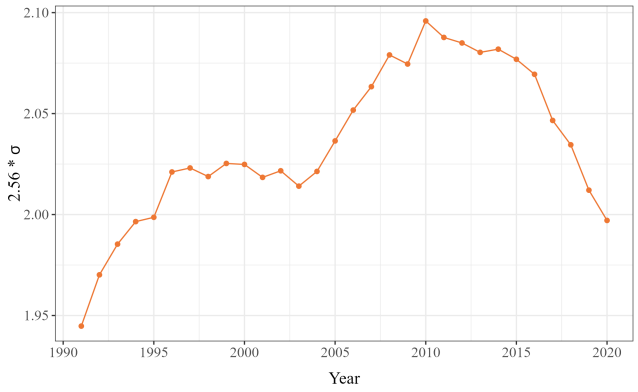
A Data: Summary statistics[12]

	Number of individuals				Percentage of women			
Year	Original	CS	LX	H	Original	CS	LX	H
1991	983,476	530,283	378,260	-	44.92	43.14	41.76	-
1992	979,065	527,550	380,470	-	44.96	43.42	42.13	-
1993	977,567	533,715	386,543	320,466	44.91	43.68	42.51	41.25
1994	989,879	545,664	395,941	323,470	45.03	43.96	42.86	41.64
1995	1,012,618	562,889	409,693	331,145	45.4	44.31	43.23	41.99
1996	1,034,423	590,827	426,375	341,581	45.74	44.48	43.51	42.31
1997	1,045,595	600,838	432,706	352,414	46.01	44.78	43.7	42.69
1998	1,048,281	609,306	434,783	362,646	46.01	44.97	43.83	42.88
1999	1,056,571	616,042	439,602	367,774	46.12	45.19	44.08	43.13
2000	1,076,253	626,512	446,972	372,791	46.31	45.48	44.34	43.28
2001	1,095,857	635,920	453,911	376,923	46.64	45.69	44.48	43.46
2002	1,112,807	640,395	457,142	382,168	47	45.79	44.63	43.76
2003	1,138,673	643,056	465,497	389,958	47.44	45.9	44.74	43.9
2004	1,171,995	652,977	469,845	391,155	47.79	46.07	44.89	43.97
2005	1,205,964	666,143	477,674	395,078	47.89	46.14	44.97	44.06
2006	1,235,593	679,819	488,542	402,392	47.96	46.34	45.08	44.16
2007	1,269,997	696,736	503,394	412,287	47.98	46.55	45.32	44.31
2008	1,318,165	725,584	516,141	419,451	47.86	46.65	45.45	44.5
2009	1,327,342	733,132	521,422	427,969	48.06	46.7	45.5	44.68
2010	1,340,228	739,348	528,695	439,966	48.05	46.7	45.53	44.81
2011	1,363,749	755,250	538,667	446,686	48.05	46.62	45.65	44.95
2012	1,370,301	771,205	546,236	451,853	47.67	46.7	45.81	45.04
2013	1,370,705	779,184	552,304	459,918	47.58	46.7	45.9	45.14
2014	1,403,134	788,363	559,697	467,106	47.76	46.76	46.18	45.39
2015	1,432,924	798,600	564,879	470,454	47.99	47.01	46.57	45.67
2016	1,467,041	808,594	-	-	48.22	47.24	-	-
2017	1,499,854	819,852	-	-	48.47	47.42	-	-
2018	1,527,016	833,686	-	-	48.58	47.64	-	-
2019	1,556,649	848,159	-	-	48.78	47.92	-	-
2020	1,557,642	854,916	-	-	49	48.22	-	-

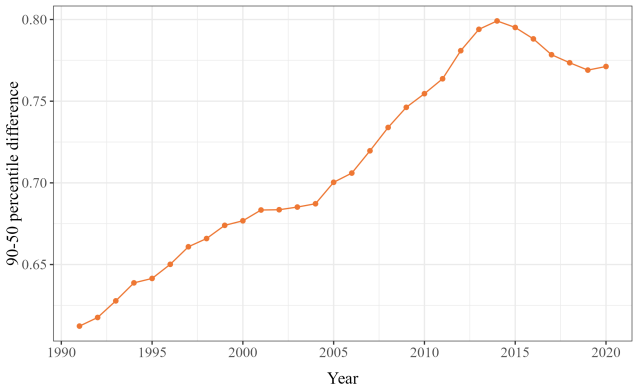
Table A.1: Sample size and percentage of women in ALife (Original), CS, LX and H samples per year

[12]More statistics are provided in our Online Technical Appendix.

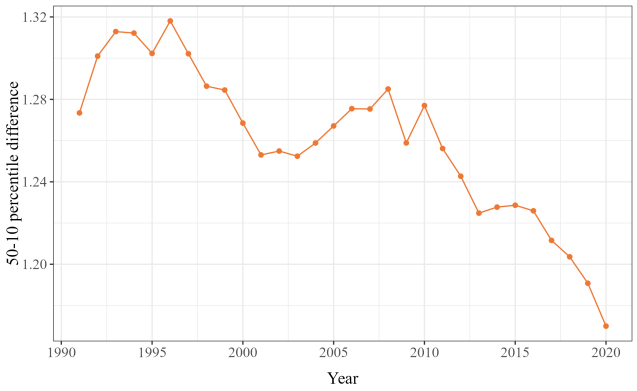
B Additional results



(a) 2.56*σ



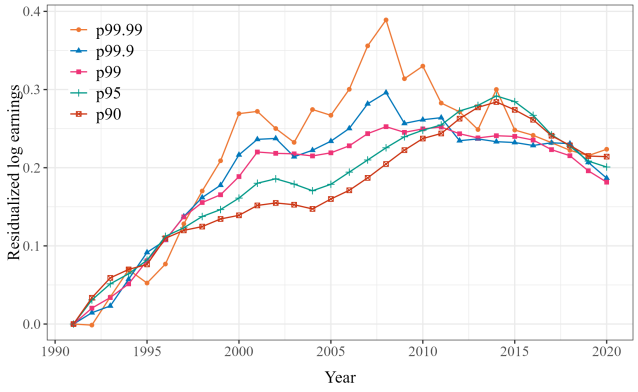
(b) P90-P50



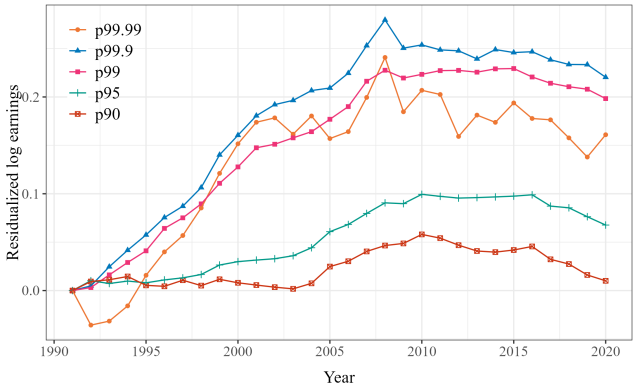
(c) P50-P10

Figure B.1: Trends in earnings inequality

Note: Gini coefficient (panel a) is calculated on real earnings y_{it}. Percentile differences (panels c-d) are calculated on residualized log earnings ε_{it}.



(a) Men



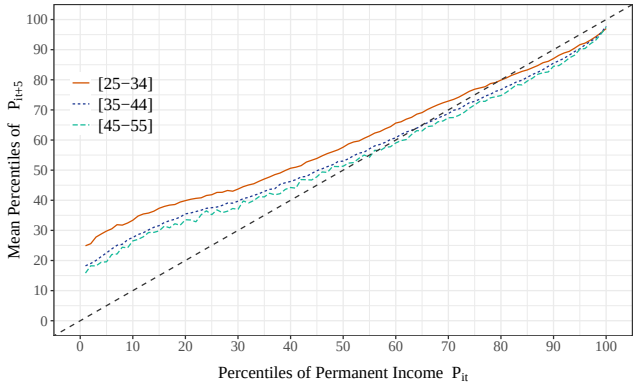
(b) Women

Figure B.2: Change in top percentiles of the residualized log earnings distribution

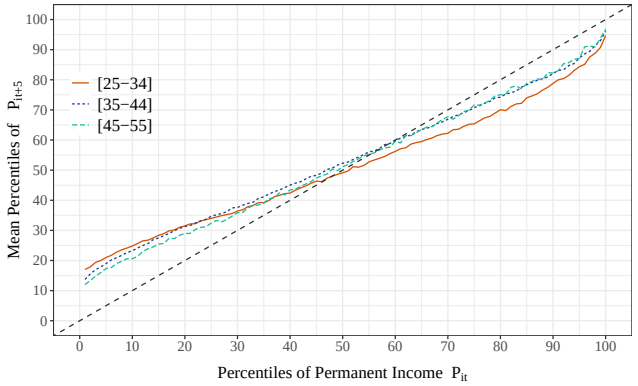
Note: Residualized log earnings ε_{it} for each percentile are normalized by their respective value in 1991.

Figure B.3: **5-year average rank mobility (Averages of 1993-2010)**

(a) Men



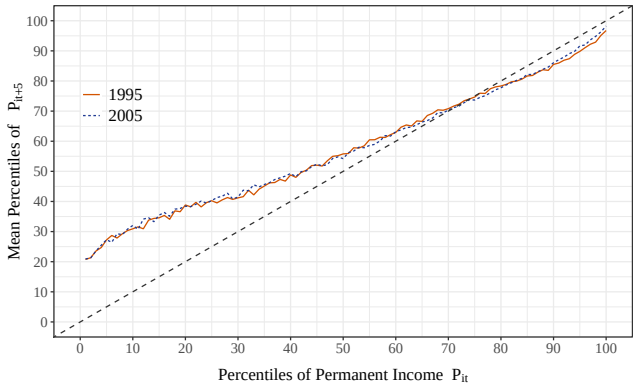
(b) Women



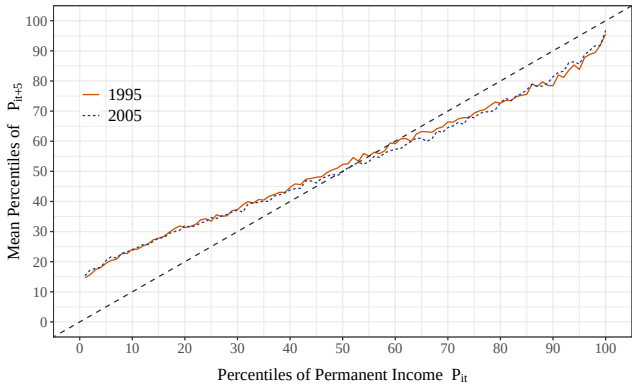
Note: This figure shows the 5-year average rank mobility for men and women, based on averages from 1997 to 2007. Panel (a) illustrates the mobility for men, while panel (b) shows the mobility for women, across two age groups: 25–34 and 35–44. The y-axis represents the mean percentile rank ten years later, while the x-axis shows the initial percentile rank in the permanent income distribution. The 45-degree line represents perfect mobility, where initial rank equals rank ten years later. This graph highlights the persistence of income ranks over time, with younger workers (25–34) showing slightly higher upward mobility than their older counterparts.

Figure B.4: **5-year average rank mobility over time - 1995 and 2005**

(a) Men



(b) Women



Note: This figure illustrates 5-year average rank mobility over time for men and women, comparing the years 1995 and 2005. Panel (a) shows mobility for men, and panel (b) shows mobility for women. The similarity between the 1995 and 2005 lines suggests stable rank mobility over time, with minimal variation in upward or downward mobility across these periods for both genders.

C Extension: Market and post-government income

We extend the analysis to include other sources of income. To ease exposition, we use the individual budget constraint to organise incomes, transfers and taxes as follows. Consider a worker i aged j at time t, where $i \in \{1, ..., N\}$, $j \in \{j_1, ..., J\}$ and $t \in \{1991, ..., 2020\}$. Her budget constraint at a point in time is given by

$$c^i_{j,t} + a^i_{j+1,t+1} = \overbrace{\underbrace{w^i_{j,t}n^i_{j,t}}_{\text{labor earnings}} + \underbrace{r^i_{j,t}a^i_{j,t}}_{\text{capital earnings}}}^{y^{i,market}_{j,t}\text{: market income}} - \underbrace{t^i_{j,t}}_{\text{tax}} + \underbrace{\text{t}r^i_{j,t}}_{\text{gov. transfer}} + \underbrace{b^i_{j,t}}_{\text{pri. transfer}} + \underbrace{a^i_{j,t}}_{\text{asset}}, \quad (1)$$

$y^{i,post-govt.}_{j,t}$: post-government income

where $c^i_{j,t}$ is consumption, $a^i_{j,t}$ and $a^i_{j+1,t+1}$are current and next-period asset holdings (net wealth) respectively, $w^i_{j,t}$ is wage rate, $n^i_{j,t}$ is labour supply, $r^i_{j,t}$ is rate of investment return, and $t^i_{j,t}$ is tax payment. There are four sources of income: labour earnings/income $w^i_{j,t}n^i_{j,t}$, capital earnings/income $r^i_{j,t}a^i_{j,t}$, public transfer income $tr^i_{j,t}$, and $b^i_{j,t}$ private transfer income including inheritance, inter-vivos transfers and private gifts.

We define market income as the sum of labour and capital earnings or income, $y^{i,market}_{j,t} = w^i_{j,t}n^i_{j,t} + r^i_{j,t}a^i_{j,t}$. After-tax income is $y^{i,post-tax}_{j,t} = y^{i,market}_{j,t} - t^i_{j,t}$, while after-transfer income is $y^{i,post-transfer}_{j,t} = y^{i,market}_{j,t} + tr^i_{j,t}$. Finally, post-government income is given by $y^{i,post-gov.}_{j,t} = y^{i,market}_{j,t} - t^i_{j,t} + tr^i_{j,t}$.

Next, we follow a similar approach in the main text to construct data samples and compute core statistics.We report our results in next sub-sections.

C.1 Market income: Core statistics

We provide summary statistics and report core statistics for post government income.

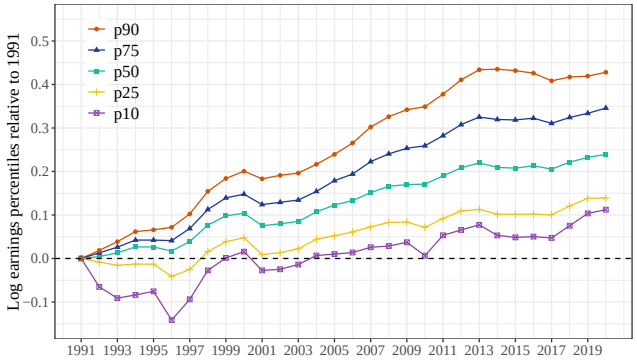
Table C.1: **Selected percentiles of the distribution of annual market income (men and women combined).**

Year	P2.5	P10	P25	P50	P75	P90	P95	P99	P99.9
1991	6,497	14,617	29,751	47,705	66,796	87,151	104,954	168,545	387,836
1995	6,223	14,296	29,958	48,891	69,469	92,161	113,261	191,938	476,614
2000	6,971	16,196	32,894	53,452	77,068	104,737	131,465	239,760	686,950
2005	6,958	16,408	33,002	54,252	79,362	109,092	137,675	258,643	726,228
2010	7,075	16,961	33,829	56,530	85,089	120,165	153,719	283,915	804,236
2015	7,946	18,688	35,412	58,412	88,745	129,346	167,151	298,158	789,976
2020	9,245	20,395	37,751	61,266	92,573	132,425	166,713	295,293	767,928

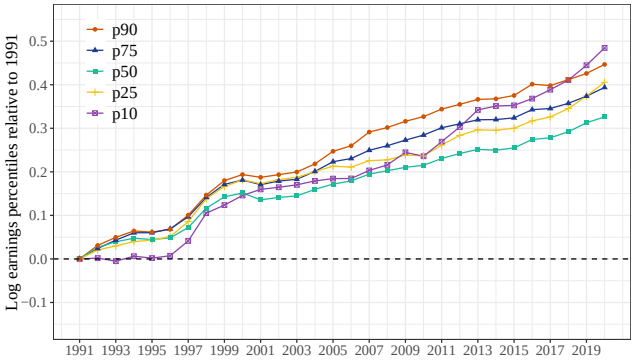
Note: Annual earnings reported in $2020 Australian dollars.

Figure C.1: **Changes in log real annual market income for selected percentiles.**

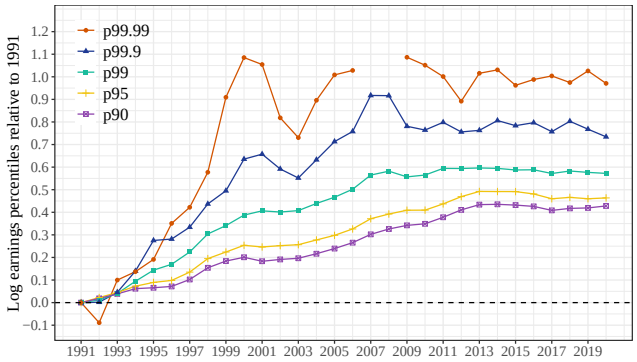
(a) Men: p10-p90



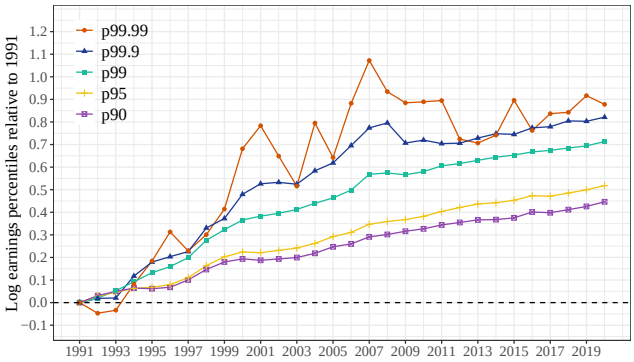
(b) Women: p10-p90



(c) Men: p90-p99.99



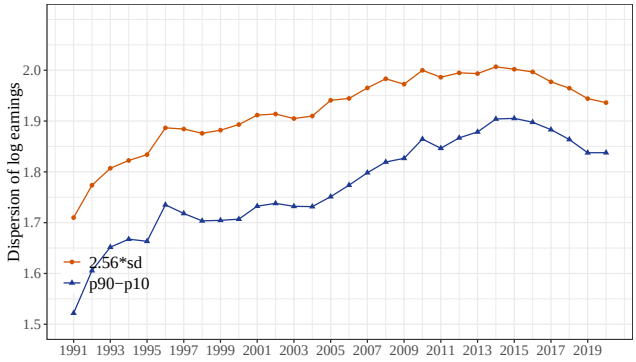
(d) Women: p90-p99.99



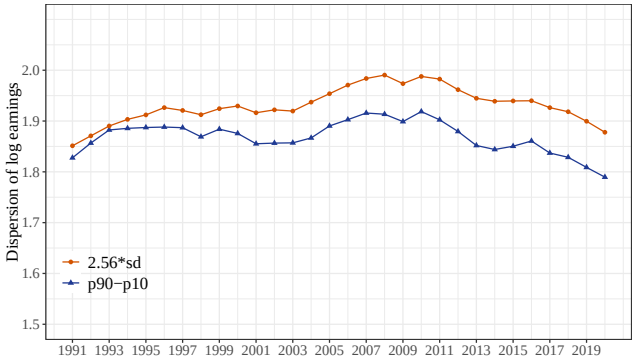
Note: The figure shows changes in percentiles of log annual market income earnings for men and women over the period from 1991 to 2019 (1991=0). Each percentile line represents a specific point in the earnings distribution, with percentiles normalized to their respective values in 1991. Panels (a) and (b) display the overall earnings distribution for men and women, respectively, from the 10th to the 90th percentiles. Panels (c) and (d) focus on the top of the earnings distribution for men and women, illustrating changes in the 90th, 95th, 99th, 99.9th, and 99.99th percentiles.

Figure C.2: **Percentile differential and 2.56 × standard deviation of log market income**

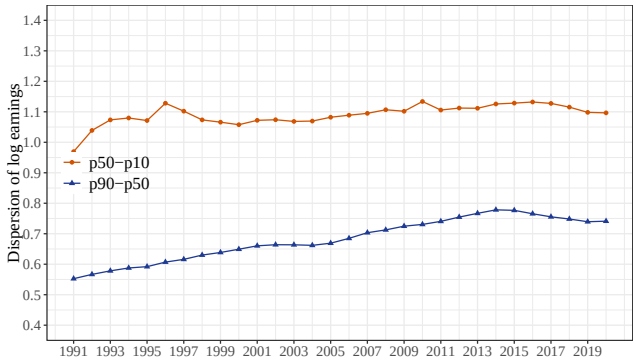
(a) Men



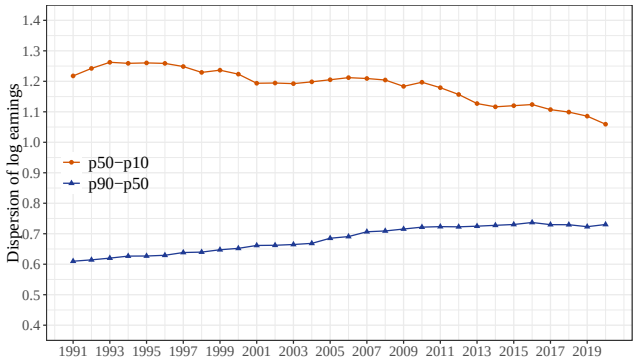
(b) Women



(c) Men: Top/bottom inequality



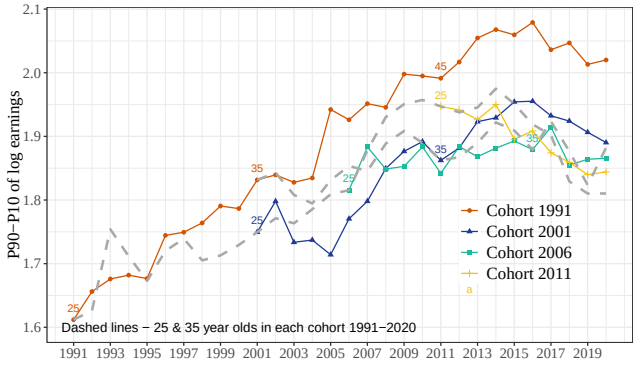
(d) Women: Top/bottom inequality



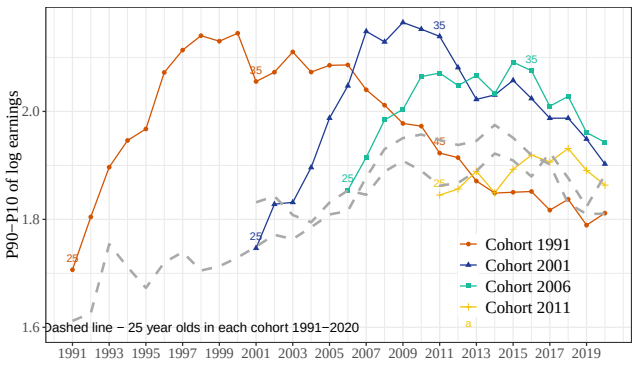
Note: This figure shows the dispersion of log real market income for men and women from 1991 to 2019. Panels (a) and (b) display overall inequality, measured by the p90-p10 differential and 2.56 times the standard deviation. Panels (c) and (d) focus on inequality within the distribution, using the p90-p50 differential (top-end inequality) and the p50-p10 differential (bottom-end inequality).

Figure C.3: **Life-cycle profiles of median log earnings and earnings inequality (p90-p10 differentials) across cohorts and time.**

(a) Men: Earnings inequality

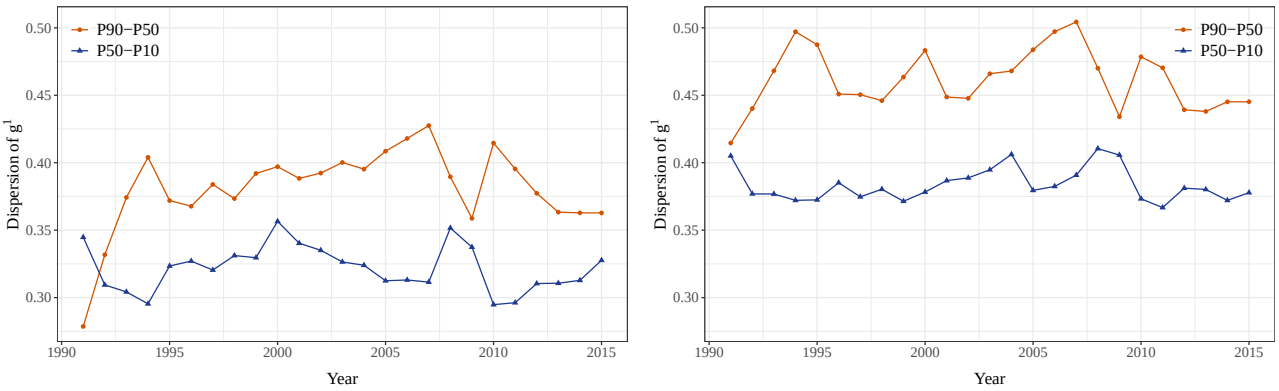


(b) Women: Earnings inequality



Note: This figure illustrates life-cycle earnings profiles across different cohorts for men and women. Panels (a) and (b) show the median log earnings by age for men and women, respectively, across four cohorts (1991, 2001, 2006, and 2011). Panels (c) and (d) present earnings inequality within each cohort, measured by the p90-p10 differential, for men and women. Dashed lines indicate the ages 25 and 35 for each cohort from 1991 to 2020.

Figure C.4: **Dispersion of one-year changes in residualized log market income by gender.**

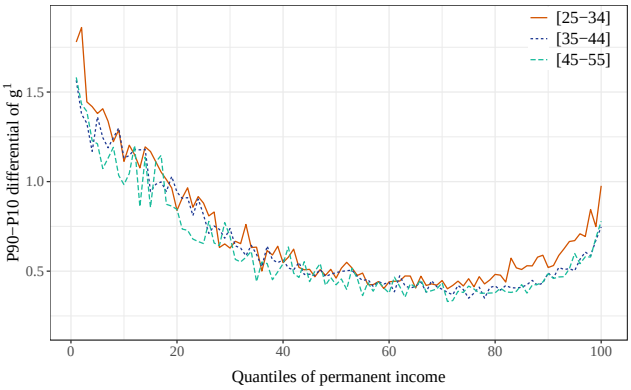


(a) Men (b) Women

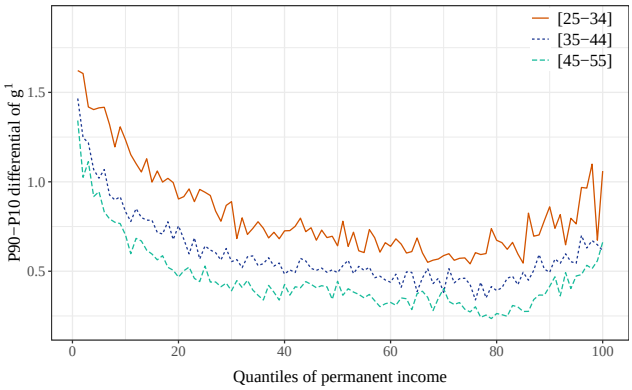
Note: This figure displays the dispersion of one-year changes in residualized log earnings for men and women from 1990 to 2015. Panel (a) shows the dispersion for men, while panel (b) shows the dispersion for women. The p90-p50 and p50-p10 differentials measure earnings volatility at different parts of the distribution, with the p90-p50 capturing upper-end dispersion and the p50-p10 focusing on lower-end dispersion.

Figure C.5: **Dispersion, Kelley Skewness and Crow-Siddiqui Kurtosis of one-year changes in log market income by age group, permanent earnings percentiles, and gender.**

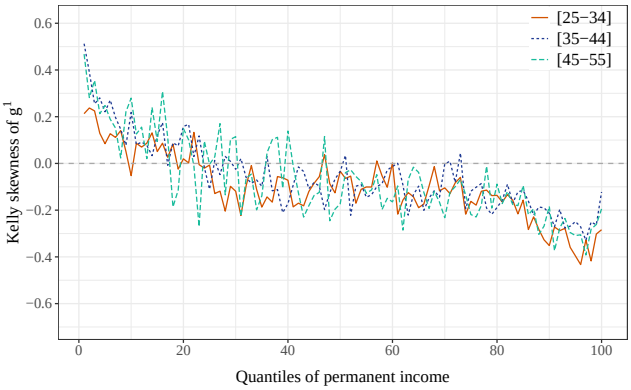
(a) Men: P90-P10



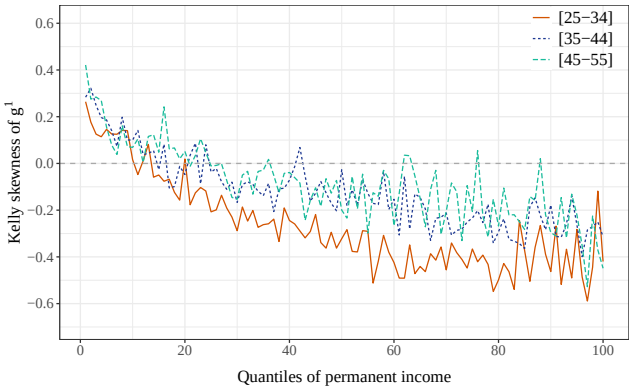
(b) Women: P90-P10



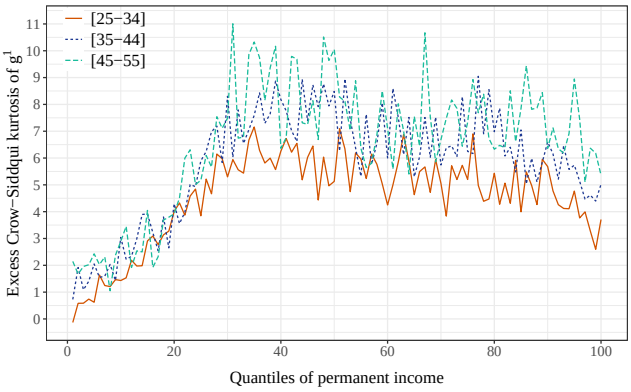
(c) Men: Kelly Skewness



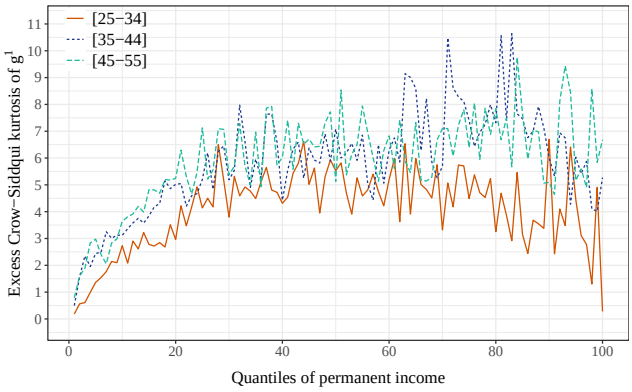
(d) Women: Kelly Skewness



(e) Men: Kurtosis



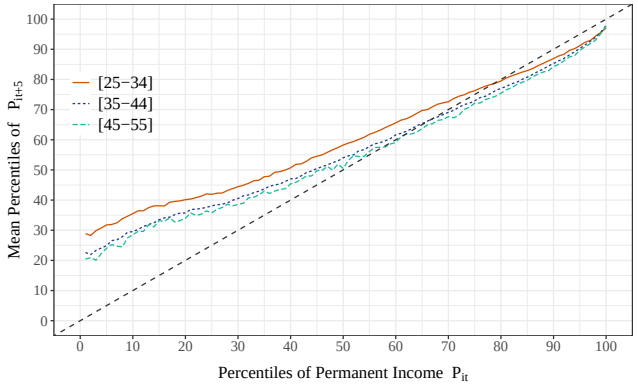
(f) Women: Kurtosis



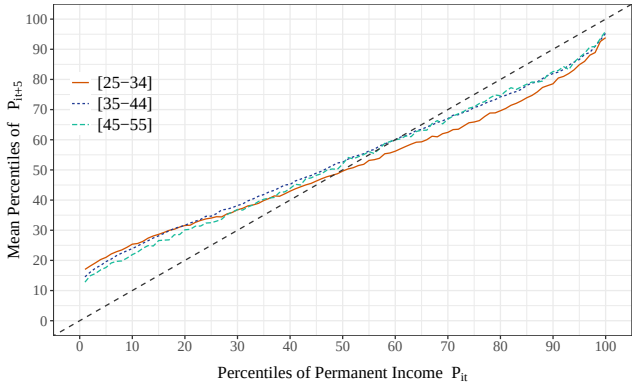
Note: This figure illustrates the dispersion, Kelley skewness, and Crow-Siddiqui kurtosis of one-year changes in log market income, segmented by age group (25–34, 35–44, 45–55), permanent income percentiles, and gender. Panels (a) and (b) show the p90-p10 differential, representing overall dispersion across income quantiles, for men and women, respectively. Panels (c) and (d) display Kelley skewness, indicating the asymmetry in earnings changes, where positive values reflect a skew toward larger extreme positive changes. Panels (e) and (f) show excess Crow-Siddiqui kurtosis, capturing the "tailedness" or frequency of extreme earnings changes.

Figure C.6: **5-year average rank mobility (Averages of 1993-2010)**

(a) Men



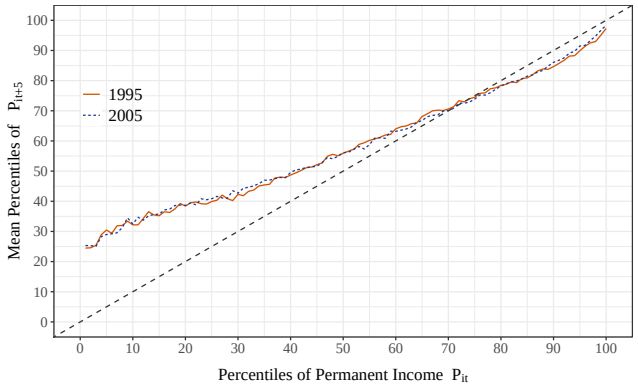
(b) Women



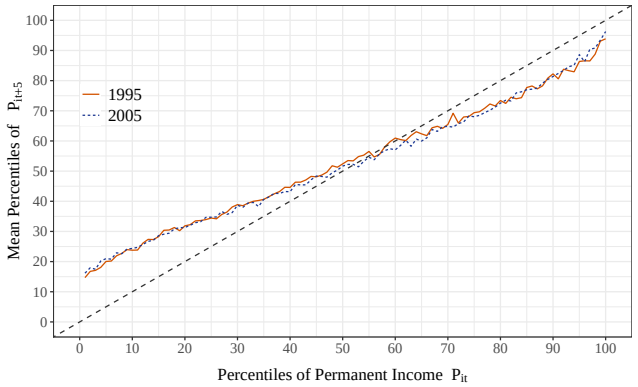
Note: This figure shows the 5-year average rank mobility for men and women, based on averages from 1993 to 2010. Panel (a) illustrates the mobility for men, while panel (b) shows the mobility for women, across two age groups: 25–34 and 35–44. The y-axis represents the mean percentile rank ten years later, while the x-axis shows the initial percentile rank in the permanent income distribution. The 45-degree line represents perfect mobility, where initial rank equals rank ten years later. This graph highlights the persistence of income ranks over time, with younger workers (25–34) showing slightly higher upward mobility than their older counterparts.

Figure C.7: **5-year average rank mobility over time - 1995 and 2005**

(a) Men



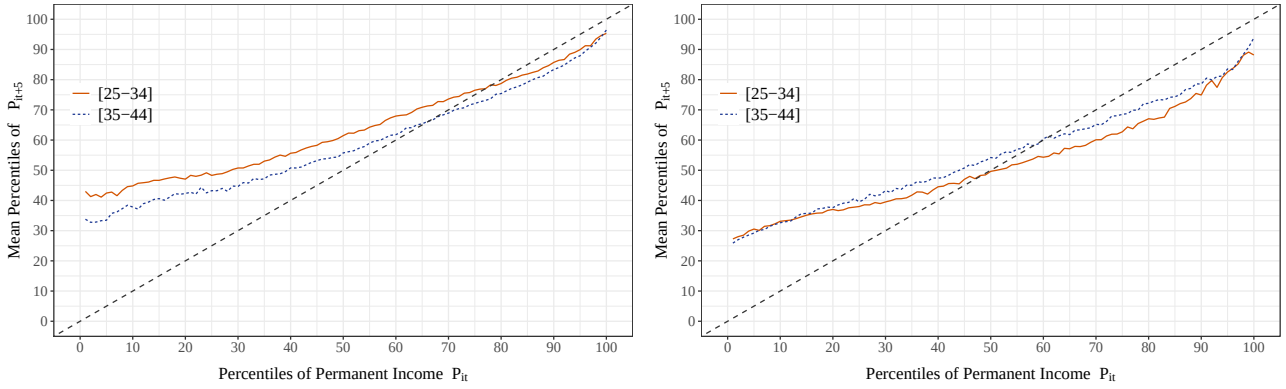
(b) Women



Note: This figure illustrates 5-year average rank mobility over time for men and women, comparing the years 1995 and 2005. Panel (a) shows mobility for men, and panel (b) shows mobility for women. The similarity between the 1995 and 2005 lines suggests stable rank mobility over time, with minimal variation in upward or downward mobility across these periods for both genders.

Figure C.8: **10-year average rank mobility (Averages of 1997-2007)**

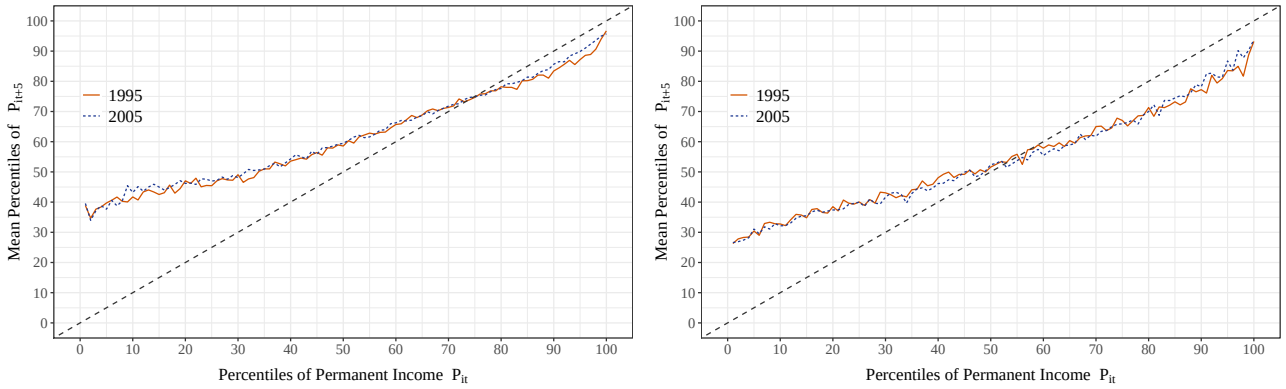
(a) Men (b) Women



Note: This figure shows the 10-year average rank mobility for men and women, based on averages from 1997 to 2007. Panel (a) illustrates the mobility for men, while panel (b) shows the mobility for women, across two age groups: 25–34 and 35–44. The y-axis represents the mean percentile rank ten years later, while the x-axis shows the initial percentile rank in the permanent income distribution. The 45-degree line represents perfect mobility, where initial rank equals rank ten years later. This graph highlights the persistence of income ranks over time, with younger workers (25–34) showing slightly higher upward mobility than their older counterparts.

Figure C.9: **10-year average rank mobility over time - 1995 and 2005**

(a) Men (b) Women



Note: This figure illustrates 10-year average rank mobility over time for men and women, comparing the years 1995 and 2005. Panel (a) shows mobility for men, and panel (b) shows mobility for women. The similarity between the 1995 and 2005 lines suggests stable rank mobility over time, with minimal variation in upward or downward mobility across these periods for both genders.

C.2 Post-government income: Core statistics

We provide summary statistics and report core statistics for post government income.

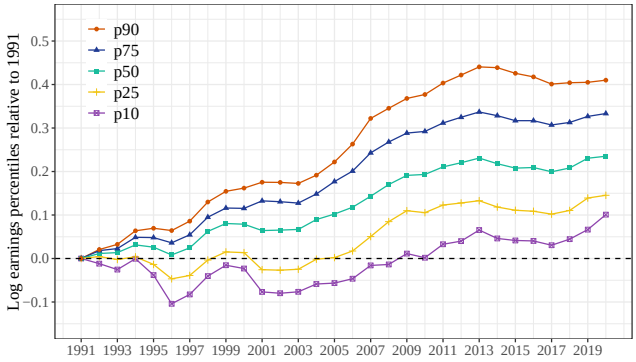
Table C.2: **Selected percentiles of the distribution of post-government income (men and women combined).**

Year	P2.5	P10	P25	P50	P75	P90	P95	P99	P99.9
1991	7,319	15,663	27,236	39,442	51,500	63,991	74,929	118,055	288,429
1995	7,905	16,653	27,734	40,146	53,829	67,958	81,106	134,928	357,412
2000	8,408	17,566	29,381	42,560	57,390	73,894	89,999	161,679	482,002
2005	7,431	17,415	29,241	43,208	60,816	78,903	95,250	165,318	443,892
2010	7,511	18,561	32,079	47,803	67,083	90,456	111,842	192,169	493,140
2015	8,332	20,047	32,865	48,213	68,301	93,982	117,588	189,636	442,068
2020	9,932	21,776	34,727	50,183	70,585	94,643	115,703	185,425	435,246

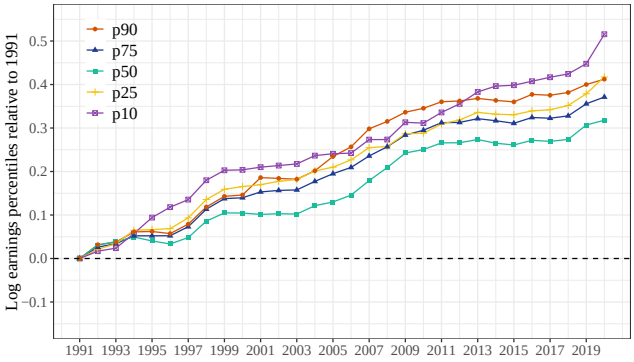
Note: Annual earnings reported in $2020 Australian dollars.

Figure C.10: **Changes in log real annual post-government income for selected percentiles.**

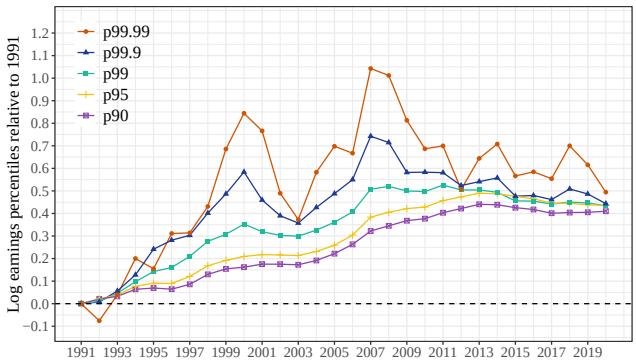
(a) Men: p10-p90



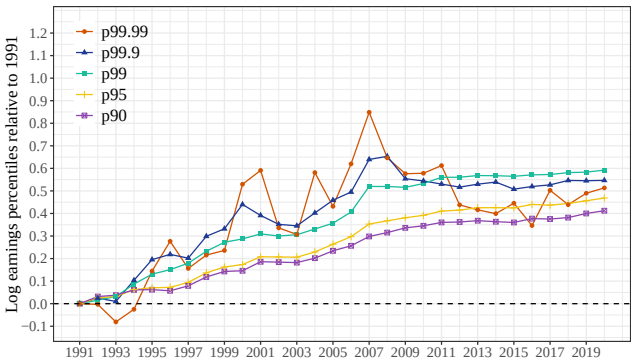
(b) Women: p10-p90



(c) Men: p90-p99.99

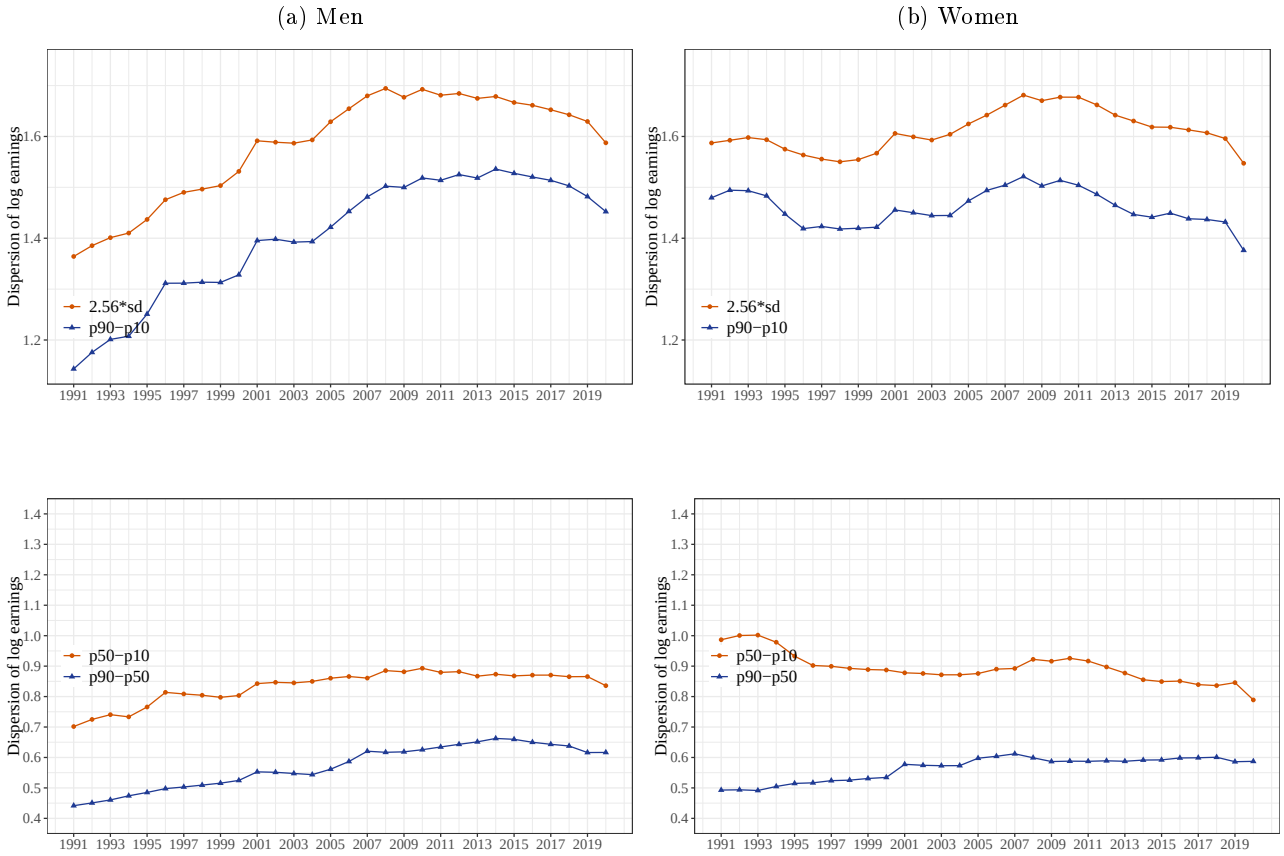


(d) Women: p90-p99.99



Note: The figure shows changes in percentiles of log real annual market income earnings for men and women over the period from 1991 to 2019 (1991=0). Each percentile line represents a specific point in the earnings distribution, with percentiles normalized to their respective values in 1991. Panels (a) and (b) display the overall earnings distribution for men and women, respectively, from the 10th to the 90th percentiles. Panels (c) and (d) focus on the top of the earnings distribution for men and women, illustrating changes in the 90th, 95th, 99th, 99.9th, and 99.99th percentiles.

Figure C.11: **Percentile differential and 2.56 × standard deviation of log post government income**



(c) Men: Top/bottom inequality

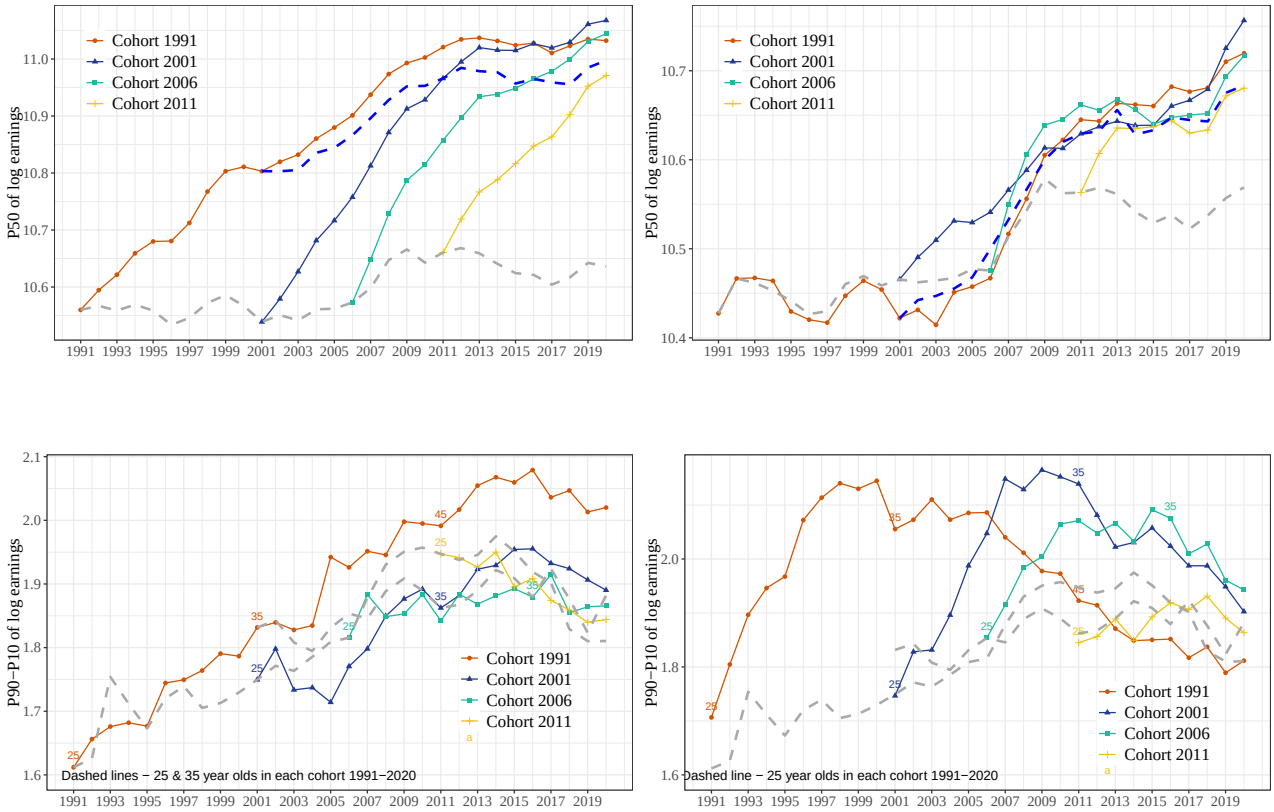
(d) Women: Top/bottom inequality

Note: This figure shows the dispersion of log real market income for men and women from 1991 to 2019. Panels (a) and (b) display overall inequality, measured by the p90-p10 differential and 2.56 times the standard deviation. Panels (c) and (d) focus on inequality within the distribution, using the p90-p50 differential (top-end inequality) and the p50-p10 differential (bottom-end inequality).

Figure C.12: **Life-cycle profiles of median log post-government income and inequality (p90-p10 differentials) across cohorts and time.**

(a) Men: Median post-govt. income

(b) Women: Median post-govt. income

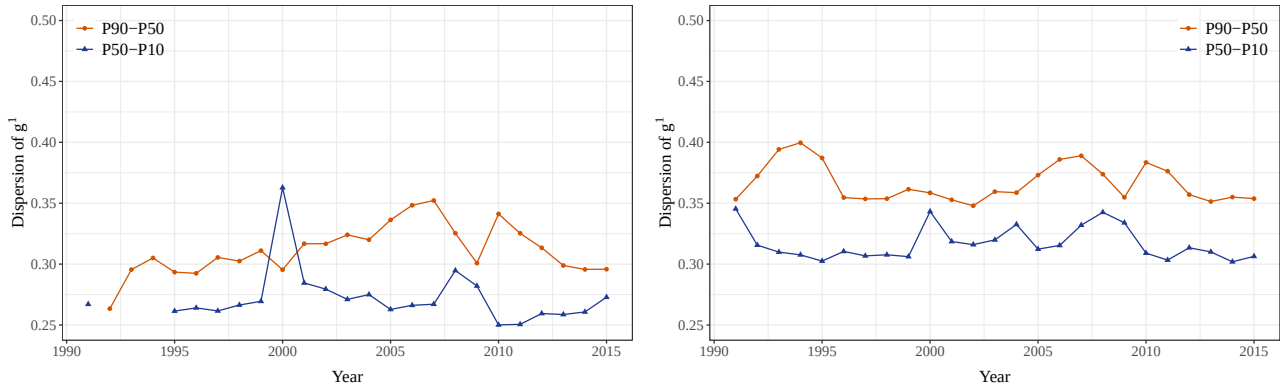


(c) Men: Post-govt. income inequality

(d) Women: Post-govt. inequality

Note: This figure illustrates life-cycle earnings profiles across different cohorts for men and women. Panels (a) and (b) show the median log earnings by age for men and women, respectively, across four cohorts (1991, 2001, 2006, and 2011). Panels (c) and (d) present earnings inequality within each cohort, measured by the p90-p10 differential, for men and women. Dashed lines indicate the ages 25 and 35 for each cohort from 1991 to 2020.

Figure C.13: **Dispersion of one-year changes in residualized log earnings by gender.**



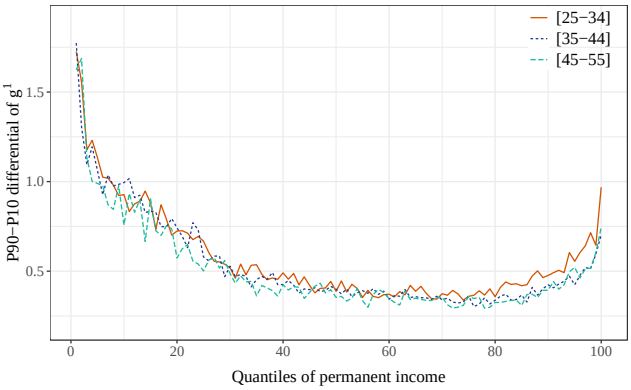
(a) Men

(b) Women

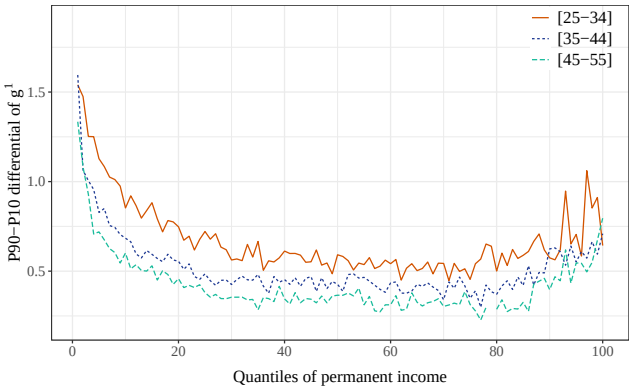
Note: This figure displays the dispersion of one-year changes in residualized log earnings for men and women from 1990 to 2015. Panel (a) shows the dispersion for men, while panel (b) shows the dispersion for women. The p90-p50 and p50-p10 differentials measure earnings volatility at different parts of the distribution, with the p90-p50 capturing upper-end dispersion and the p50-p10 focusing on lower-end dispersion.

Figure C.14: **Dispersion, Kelley Skewness and Crow-Siddiqui Kurtosis of one-year changes in log post-government income by age group, permanent income percentiles, and gender.**

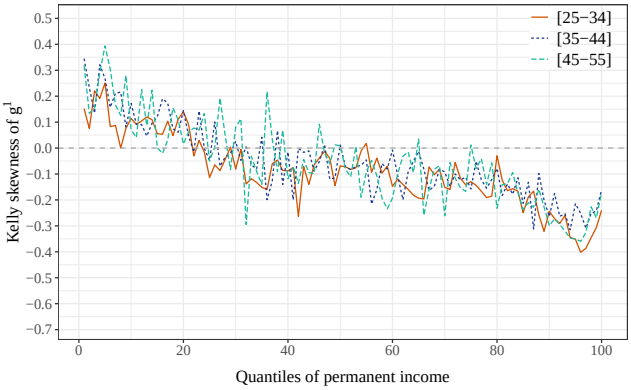
(a) Men: P90-P10



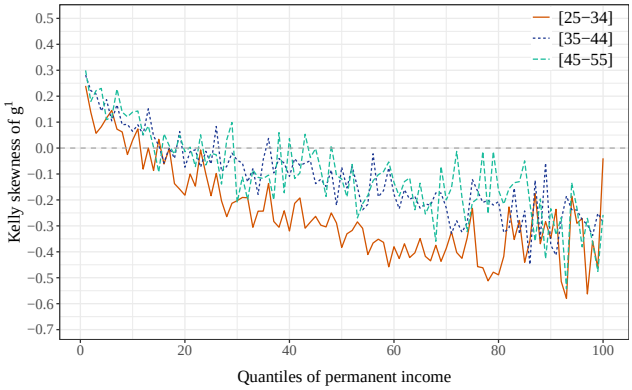
(b) Women: P90-P10



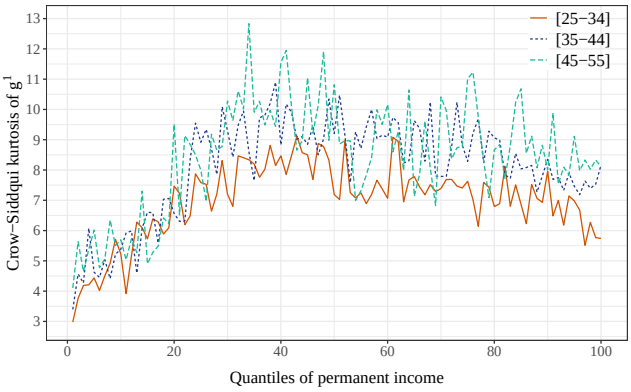
(c) Men: Kelly Skewness



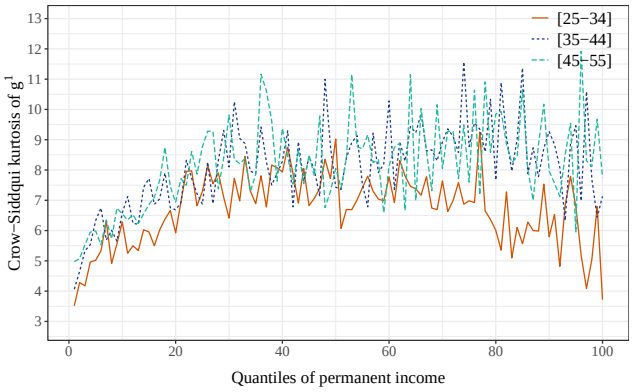
(d) Women: Kelly Skewness



(e) Men: Kurtosis



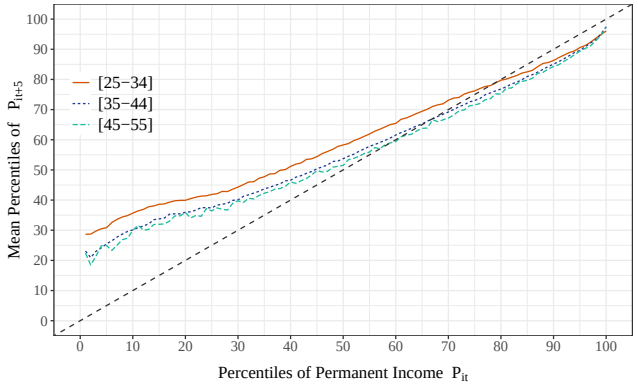
(f) Women: Kurtosis



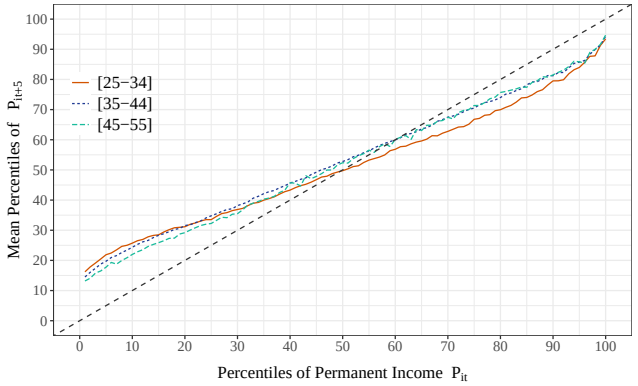
Note: This figure illustrates the dispersion, Kelley skewness, and Crow-Siddiqui kurtosis of one-year changes in log earnings, segmented by age group (25–34, 35–44, 45–55), permanent income percentiles, and gender. Panels (a) and (b) show the p90-p10 differential, representing overall dispersion across income quantiles, for men and women, respectively. Panels (c) and (d) display Kelley skewness, indicating the asymmetry in earnings changes, where positive values reflect a skew toward larger extreme positive changes. Panels (e) and (f) show excess Crow-Siddiqui kurtosis, capturing the "tailedness" or frequency of extreme earnings changes.

Figure C.15: **5-year average rank mobility (Averages of 1993-2010)**

(a) Men



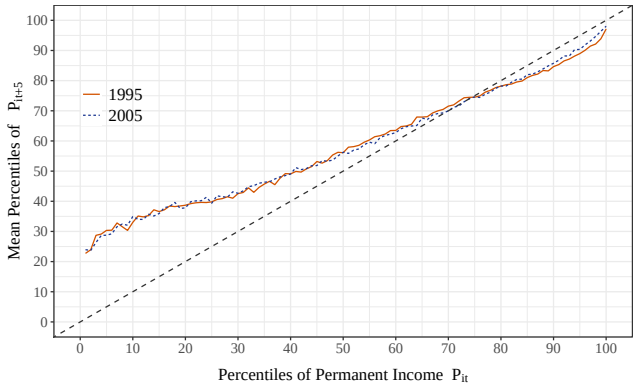
(b) Women



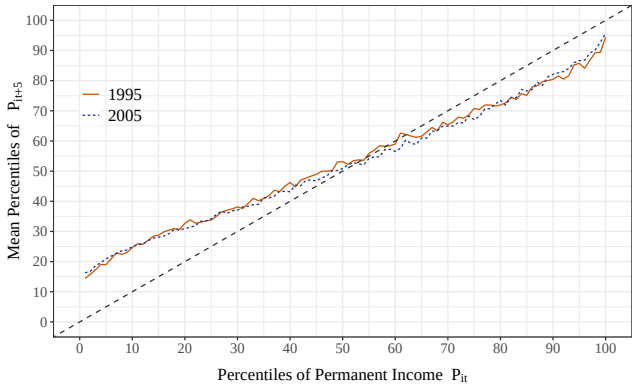
Note: This figure shows the 5-year average rank mobility for men and women, based on averages from 1993 to 2010. Panel (a) illustrates the mobility for men, while panel (b) shows the mobility for women, across two age groups: 25–34 and 35–44. The y-axis represents the mean percentile rank ten years later, while the x-axis shows the initial percentile rank in the permanent income distribution. The 45-degree line represents perfect mobility, where initial rank equals rank ten years later. This graph highlights the persistence of income ranks over time, with younger workers (25–34) showing slightly higher upward mobility than their older counterparts.

Figure C.16: **5-year average rank mobility over time - 1995 and 2005**

(a) Men



(b) Women



Note: This figure illustrates 5-year average rank mobility over time for men and women, comparing the years 1995 and 2005. Panel (a) shows mobility for men, and panel (b) shows mobility for women. The similarity between the 1995 and 2005 lines suggests stable rank mobility over time, with minimal variation in upward or downward mobility across these periods for both genders.