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ABSTRACT

Using panel data on individual labor income histories from 1957 to 2013, we document two empirical facts about the distribution of lifetime income in the United States. First, from the cohort that entered the labor market in 1967 to the cohort that entered in 1983, median lifetime income of men declined by 10%–19%. We find little-to-no rise in the lower three-quarters of the percentiles of the male lifetime income distribution during this period. Accounting for rising employer-provided health and pension benefits partly mitigates these findings but does not alter the substantive conclusions. For women, median lifetime income increased by 22%–33% from the 1957 to the 1983 cohort, but these gains were relative to very low lifetime income for the earliest cohort. Much of the difference between newer and older cohorts is attributed to differences in income during the early years in the labor market. Partial life-cycle profiles of income observed for cohorts that are currently in the labor market indicate that the stagnation of lifetime incomes is unlikely to reverse. Second, we find that inequality in lifetime incomes has increased significantly within each gender group. However, the closing lifetime gender gap has kept overall lifetime inequality virtually flat. The increase within gender groups is largely attributed to an increase in inequality at young ages, and partial life-cycle income data for younger cohorts indicate that the increase in inequality is likely to continue. Overall, our findings point to the substantial changes in labor market outcomes for younger workers as a critical driver of trends in both the level and inequality of lifetime income over the past 50 years.

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1 Introduction

Since the 1970s, two main trends have characterized the U.S. labor market: (i) stagnating average incomes and (ii) rising income inequality. These twin trends, which have shown remarkable resilience, have spurred both active academic research into their primary causes and heated public debate over the appropriate policy responses. Yet despite this intense attention, the vast body of available empirical evidence pertains almost entirely to point-in-time measures of income, with little evidence on trends in lifetime incomes.[1] This dearth of evidence is not because of an oversight on the part of economists. Going back at least to the 19th century (Farr (1853)), researchers have been well aware that for many questions in the social sciences, lifetime income is the relevant concept because it provides a more complete picture of an individual's lifetime resources. Lifetime income accounts for the transitory nature of point-in-time (often annual) income and long-run economic mobility, as well as the extensive margin of participation in the labor market. For many questions, the difference between lifetime and point-in-time measures can matter greatly.[2]

Rather, the lack of a systematic analysis of the distribution of lifetime incomes in the United States is due to the scarcity of micro data sets with sufficiently long individual income histories. Thus, to shed light on this topic, this paper begins by constructing measures of lifetime income for millions of individuals, using a 57-year-long panel (covering the period 1957–2013) of individual income histories from U.S. Social Security Administration (SSA) records. Our baseline lifetime income measure is based on 31 potential working years between ages 25 to 55, which allows us to construct lifetime income statistics for 27 year-of-birth cohorts. The first (oldest) cohort turned age 25 in 1957, and the last (youngest) cohort turned age 55 in 2013, the last year of our sample. Throughout this paper, we refer to cohorts by the year in which they turned 25.[3]

[1] We discuss exceptions in the literature review in Section 1.1. In this paper, because of the nature of our data set (discussed in Section 2), we exclusively focus on labor income.

[2] For example, a 30-year-old medical intern who earns $40,000 is close to the median worker in that year but will likely end up in the top 5% of the lifetime income distribution. Similarly, a 22 year-old rookie NFL player who makes $400,000 will be in the top 1% of the income distribution that year but may easily be out of the top 10% of the lifetime income distribution. These are extreme examples, but long-run upward mobility is common, as predicted by human capital or superstar theories, as is downward mobility due to declines in health status or difficulties in switching careers in response to occupation- or industry-specific shocks.

[3] As we explain in Section 2, we exclude individuals who participated in the labor market for less than 16 years, to enable us to focus on individuals with a relatively strong lifetime labor market attachment. An individual is considered a nonparticipant if he or she has negligible labor income in that year, as defined in Section 2.

Our main contribution is to document counterparts to the twin trends, but using lifetime incomes rather than annual incomes. To our knowledge, this paper provides the first analysis of lifetime income distributions for a large number of cohorts in the United States. To that end, we ask four related sets of questions.

First, in Section 3 we ask how the lifetime income of the median worker has changed from the first cohort (hereafter, the 1957 cohort) to the last one (hereafter, the 1983 cohort, since individuals in that cohort turned 25 in 1983) and, given the remarkable changes in women's roles in the labor market over this period, whether these trends differ by gender.[4] We find that the lifetime income of the *median male worker* declined by 10% to 19% (depending on the price deflator we use), beginning with the cohort that turned 25 in 1967 and ending with the cohort that turned 25 in 1983. Perhaps more strikingly, more than three-quarters of the distribution of men experienced no rise in their lifetime income across these cohorts. The only time period during which the lifetime incomes of these men rose is from the 1957 cohort to the 1966 cohort. In contrast, subsequent cohorts of female workers have seen large and very steady gains—on the order of 22% to 33% for the *median female worker*. However, because these gains started from a very low level of lifetime income for the 1957 cohort, they were not large enough to offset the losses by men. An important related trend during this period was the rise of non-wage benefits, dominated by employer-provided health insurance and retirement benefits. Our data set does not contain individual-level information on non-wage benefits, but we use the National Income and Product Accounts (NIPAs) to obtain an upper bound on the growth of such benefits. Incorporating the growth in these benefits mitigates but does not overturn these findings.

Some dollar figures can be useful to appreciate the magnitude of these trends. When nominal earnings are deflated by the personal consumption expenditure (PCE) deflator, the annualized value of median lifetime wage/salary income for male workers declined by $4,400 per year from the 1967 cohort to the 1983 cohort, or $136,400 over the 31-year working period. Adding in an upper bound estimate of growth in non-wage benefits reduces this loss from $4,400 per year to $3,100 per year, or $96,100 over the working life. Using the Consumer Price Index (CPI) to deflate nominal incomes reveals an even bleaker picture: a loss of $9,150 per year in wage/salary income or $7,850 when estimated non-wage benefits are included. The corresponding total lifetime loss is $283,650 for wage/salary income and $243,350 when estimated benefits are included.

[4] See Acemoglu and Autor (2011) for an up-to-date review of the empirical evidence going back to the 1960s.

Second, in Section 4 we ask whether these trends in median lifetime incomes are primarily due to trends in incomes at younger ages or older ages. We study how the shape of income profiles has changed across cohorts and what this information reveals about the prospects for the cohorts of workers who are currently in the labor market. For men, we find that the stagnation of median income is closely related to declining median income of young workers, which is not compensated for by faster average income growth later in the career. The median income at age 25 have declined steadily from the 1967 cohort to the 1983 cohort. Moreover, median incomes over the first 10 years in the labor market for more recent cohorts indicate that the trend of declining median lifetime incomes for men seems likely to continue.

Third, in Section 5 we ask whether lifetime income inequality increased alongside the well-documented increase in cross-sectional inequality. For the pooled sample of men and women, we find only a small rise in lifetime inequality and measures of inequality that are not dominated by the top percentiles reveal little to no rise in lifetime inequality across these cohorts. For example, the interquartile range of lifetime income and the 50-10 ratio (i.e. ratio between the 50th and 10th percentiles of the lifetime income distribution) both declined. Although these findings for lifetime inequality may appear surprising in light of the increase in cross-sectional income inequality, they are actually driven by a closing of the lifetime gender gap. We show that as with cross-sectional income, the gender gap in lifetime income has narrowed. This has kept overall inequality virtually flat despite the relatively large rise in lifetime inequality within each gender group.

Fourth, in Section 6 we ask how the aggregate lifetime income of each cohort (the pie) is distributed across men and women in different parts of the lifetime income distribution, and how this distribution has changed across cohorts. We find that over the course of a generation (27 cohorts), the share of aggregate cohort income accruing to women nearly doubled. A large part of this increase is a result of women becoming more strongly attached to the labor force (working for 15 or more years between the ages of 25 and 55). Breaking down the aggregate cohort lifetime income into different percentiles of the lifetime income distribution reveals that the share of cohort lifetime income for 90% men has decreased over this period, with significant increases only for men in the top 1% of the male lifetime income distribution. On the other hand, women in all parts of the lifetime income distribution have seen an increase in their share of aggregate cohort lifetime income.

1.1 Related Literature

The measurement of lifetime income has been a pressing question for researchers since at least the 19th century. Famous statistician and epidemiologist William Farr (1853) made one of the first serious attempts to construct a measure of lifetime income for British workers. Since then, researchers across scientific disciplines have found lifetime income to be a central concept for many key questions pertaining to individuals, such as their overall well-being, social status, political leanings, health status and longevity, among other characteristics.

For example, lifetime income plays an especially central role in economics. The impetus for William Farr's work (a scientific report commissioned by the British Parliament) was the idea that an equitable tax system can only be built with the knowledge of the lifetime resources and lifetime burdens of individuals. This perspective is just as relevant today. Similarly, life-cycle investment in long-term assets—such as education/human capital, occupational choice, and children—also requires knowledge of lifetime resources and outcomes. For this purpose, a long list of studies going back to Walsh (1935), Houthakker (1959) and Miller (1960), focused on computing the lifetime benefits of education. Similarly, Clark (1937), Friedman and Kuznets (1954), Wilkinson (1966) and others computed the lifetime incomes of various socioeconomic or occupational groups. The human capital theory of Mincer (1958), Becker (1962), and Ben-Porath (1967) typically makes assumptions so that one can infer the returns to income with cross-sectional data only, even though optimal investments in human capital are based on lifetime income gains.

In other fields, actuaries and legal scholars have been interested in measuring lifetime income—which they dubbed the "money value of man"—to provide a benchmark for compensation in personal injury lawsuits, and historians have used them to estimate the indirect costs of wars and disasters (Creedy (1977)). Scholars in medicine focus on lifetime income because of its close link to many health outcomes ranging from life expectancy to drug abuse.[5]

The vast majority of these studies (before the 1970s) had access only to cross-sectional data by socio-economic groups. Clearly, such data do not allow one to compute precise measures of lifetime income, let alone its distribution in the population. They can however be used to obtain relatively crude measures of average lifetime income for certain groups. As short panel data sets started to become available in the 1970s, researchers started to move away from simply averaging of cross-sectional profiles to incorporate income dynamics.

[5]For example, assessing the progressivity or regressivity of cigarette taxes has been argued to depend on the lifetime earnings for smokers versus nonsmokers (e.g., Leigh and Hunter (1992)).

This involves estimating statistical processes for income using panel data, from which the distribution of lifetime income can be inferred (see Fase (1971), Bowlus and Robin (2004), Brown et al. (2009), Coronado et al. (2011), among others).

Because of data limitations, previous studies have typically had to rely on short panel data focused on earnings averaged over a few years (ranging from 5 to 12 years). Some of these studies focused on inequality in the first 10 years of one's career (Aaronson (2002), Leonesio and Del Bene (2011)). Others looked at transitions in wage income and across labor market statuses over periods of a few years and extended that to the entire life cycle to obtain measures of lifetime earnings inequality.[6] Focusing on cross sections could underestimate the number of individuals who are loosely attached to the labor force, and the emphasis on parametric methods could miss important nonlinearities in earnings processes, as recently documented in Guvenen et al. (2015). This is why a direct measurement which avoids most of these assumptions is indispensable.[7]

Longer panels have been used in a more recent strand of the literature that focuses directly on the Social Security benefits system. For example, Brown et al. (2009) and Coronado et al. (2011) use Panel Study of Income Dynamics (PSID) data in combination with simulation models to deal with missing observations and attrition (a serious challenge when survey data are used over long horizons). Closer to our work, Gustman and Steinmeier (2001) and Liebman (2002) have used survey data sets (such as the Health and Retirement Survey (HRS) and the Survey of Income and Program Participation (SIPP)) that are matched with Social Security earnings records to study lifetime inequality in the context of the retirement system.

Finally, the evolution of lifetime inequality has been studied by Bowlus and Robin (2004), who estimated the dynamics of employment, unemployment, and wages from short panels and used the resulting process to simulate lifetime inequality for cohorts from 1977 to 1997. They reached two conclusions: (i) lifetime inequality as measured by the log 90-10 differential is about 40% lower than the same measure cross-sectionally, but (ii) the rise in lifetime inequality closely tracked , and rose by a similar amount to, cross-sectional inequality.

[6]See, for example, Lillard (1977) for the United States, Layard (1977) for the United Kingdom and Bonhomme and Robin (2009) for a more recent and ambitious effort.

[7]Other papers have used longer panels from countries other than the United States. Bjorklund (1993) uses data from Sweden covering 1951 to 1989. However, his sample is extremely small. He has data on 13 cohorts, each ranging from 36 to 50 individuals. Blomquist (1981) used the same data set but with a shorter sample Aaberge and Mogstad (2015) compare lifetime inequality and cross-sectional inequality using population data for 3 cohorts from Norway.

2 Data

2.1 Data Sources

Our data come from the Continuous Work History Subsample (CWHS), which is a research extract from the U.S. Social Security Administration's (SSA) Master Earnings File (MEF). The CWHS is a 1% representative sample of U.S. workers whose jobs were covered by the Social Security system. The primary advantage of the CWHS is the long span of time covered, starting in 1957. For the 1957–2004 period, we use the sample constructed and cleaned by Kopczuk et al. (2010); further details can be found in that paper. We extend their sample to the years 2004–2013 by using the underlying data from the MEF for those years. Our final data set covers 57 years from 1957 to 2013, which allows us to compare lifetime incomes (31 years) for 27 birth cohorts.

During this period, the SSA has increased the set of industries that it covers, which poses a challenge for defining a sample whose representativeness is stable over time. We thus follow Kopczuk et al. (2010) by restricting our attention to workers employed in "commerce and industry," a group of sectors that was continuously covered by the SSA during this period.[8] Workers in commerce and industry accounted for approximately 70% of private sector employment in 2004. We have compared annual incomes in the Current Population Survey (CPS) for workers in all sectors with workers in commerce and industry. Figure B.4 in Appendix B shows that the level and time trends of median annual income at different ages are virtually identical for the two groups of workers. (In Section 4.4, we provide a detailed comparison of our data set with the CPS). Further details on the CWHS can be found in Panis et al. (2000), and further details on its coverage can be found in Kopczuk et al. (2010).

The measure of labor income recorded in the CWHS is wage and salary income.[9] From 1957 to 1977, labor income data are from quarterly reports of wage and salary income supplied by employers to the SSA. From 1978 onward, labor income data come directly from individual W-2 forms (Box 1) and include wages and salaries, bonuses, and exercised stock options.[10] To avoid possible privacy issues, we do not report any statistics for demographic

[8] Following Kopczuk et al. (2010), we define "commerce and industry" workers to include all SIC codes, except for agriculture, forestry and fishing (01–09), hospitals (8060–8069), educational services (82), social service (83), religious organizations and non-classified membership organizations (8660–8699), private households (88), and public administration (91–97).

[9] From 1978, the CWHS also includes data on self-employment income from Schedule SE. We do not include it in our measure of income, since it is not available in earlier years and is top-coded until 1994.

[10] Quarterly compensation reports were subject to top-coding at the taxable ceiling for Social Security

cells (for example, a gender-year-income group) that contain fewer than 30 individuals. Because of the large size of the CWHS, such cells are rarely encountered. In addition to income, the CWHS contains information on date of birth and gender.

In a companion paper (Guvenen et al. (2016)), we analyze the distribution of lifetime incomes for a handful of recent cohorts, using a larger 10% subsample from the MEF that does not suffer from most of the limitations of the data set used in this paper. That data set covers workers in *all* sectors, not just commerce and industry, contains data on a broader definition of income that also includes income from self-employment, is not top-coded, and allows us to identify foreign-born workers. However, unlike the data set used in this paper, it is only available from 1978, which limits its use for studying trends in lifetime incomes. For the five cohorts that are covered in both data sets, median lifetime income is around 10% higher in the larger sample, reflecting the broader coverage, but the level of inequality and the trends in both the median and inequality are extremely similar across the two samples.

2.2 Adjusting for Inflation

In order to convert nominal incomes in the CWHS into real values, we need to choose an appropriate price index. Since our data span nearly six decades, this choice of price index matters. The two most commonly used price indexes are (i) the personal consumption expenditure (PCE) deflator from the Bureau of Economic Analysis (BEA) and (ii) the consumer price index (CPI) from theBureau of Labor Statistics's (BLS) . The (older) CPI and the (newer) PCE differ in several ways that are by now well understood.[11]

The PCE is generally accepted to be the superior index for measuring the *overall* price level and its evolution over the business cycle. It is thus the standard choice in aggregate (macro) economic analyses. However, for more micro work, such as the analyses in this paper, the CPI has some advantages. In particular, the CPI aims to capture the price level faced by the typical household for its *out-of-pocket* expenses and is thus based on a detailed survey of U.S. household expenditures, whereas the PCE is based on business surveys and also includes purchases made by others on behalf of households. Consequently, relative to the PCE, the CPI places a lower weight on health care prices (since a large

contributions. Annual income above the taxable ceiling is imputed based on the pattern of quarterly earnings reports. For a detailed description of this imputation procedure, see Kopczuk et al. (2010). W-2 forms, which are the source of earnings data from 1978 onward, are not top-coded.

[11]For a comparison between the two indexes, see, for example, US Bureau of Labor Statistics (2011) or McCully et al. (2012).

fraction of total expenditures is paid by Medicare/Medicaid and insurance companies) and a much higher weight on housing and transportation. Because of this close connection to household living expenses, many government transfer programs (including the SSA pension and disability benefits systems) use the CPI to adjust for inflation. Existing academic studies of heterogeneity and inequality have used both series.[12]

In our empirical analysis, we choose the PCE as our baseline measure for deflating nominal incomes because it implies a lower cumulative inflation over this period than the CPI. We report all values in 2013 dollars. As we shall see in the next section, one of our main findings is a large slowdown in the growth of lifetime incomes, and this point is made more forcefully with the conservative choice of the PCE. That said, we also report some of the key statistics using the CPI-adjusted figures, which, together with the baseline PCE-adjusted figures, provide useful bounds on the effects of the choice of price index for our findings.

2.3 Baseline Sample

From the CWHS, we select a baseline sample of individuals based on their age and a measure of lifetime attachment to the workforce. An individual is included in the baseline sample if he or she: (i) was alive from ages 25 to 55 during the panel period (1957–2013); (ii) had income that is larger than a year-specific threshold-level income, denoted by $\underline{Y}_t$, in at least 15 years between the ages of 25 and 55; and (iii) had total lifetime income of at least $31 \times \underline{Y}$ where $\underline{Y}$ is the average level of $\underline{Y}_t$ for their cohort. The threshold, $\underline{Y}_t$, is the income level that corresponds to working at least 520 hours at one-half of the legal minimum wage for that year. For 2013, this threshold was \$1,885. Imposing an annual minimum income threshold of this type is common practice in the literature on measuring annual income inequality and dynamics (see, e.g., Abowd and Card (1989), Meghir and Pistaferri (2004), and Storesletten et al. (2004)). Requiring that the minimum income threshold is met on average over the ages 25 to 55 (condition (iii)) is a natural extension of this criterion to a lifetime context. Requiring that an individual satisfies the annual minimum income threshold in at least half of their possible working years (condition (ii)) ensures that we restrict attention only to individuals who have had a relatively strong attachment to the labor market during their lives.[13]

[12] For example, Card and Lemieux (2001); Lemieux (2006); Kopczuk et al. (2010); Aguiar and Hurst (2013); Aguiar and Bils (2015); Saez (2016) use the CPI, whereas Katz and Murphy (1992); Autor et al. (2008) use the PCE.

[13] Because we are unable to distinguish between emigrants and individuals with zero earnings, and because our measure of income includes only income from commerce and industry, it is necessary to impose

2.4 Measure of Lifetime Income

We define annualized lifetime income as the sum of real annual labor income from ages 25 to 55, divided by 31:

$$\overline{Y}^i \equiv \frac{1}{31} \times \sum_{t=25}^{55} Y_t^i.$$

Since we have 57 years of income data, we can thus construct full lifetime incomes for 27 year-of-birth cohorts. We label these cohorts by the year they turned 25. The oldest cohort for which we have 31 years of data is the one that turned 25 in 1957; the youngest cohort is the one that turned 25 in 1983.

We do not discount future incomes when computing lifetime income for two reasons. First, there is no single figure that is a natural choice as the appropriate discount rate for human capital. The rates of return used in the literature to discount future financial flows (dividends, profits, etc.) range from 1%–2% (often used for short-term risk-free assets) to 6%–8% (corresponding to long-term risky assets). Moreover, human capital is different from these financial assets because it is not tradable (so there are no market prices to discipline the discount rate used) and has a risk structure that depends on many features of the institutional and redistributive environment that can alleviate or amplify such risks (welfare and benefits systems, borrowing constraints, etc). Proper discounting thus requires the use of an appropriate stochastic discount factor that accounts for these complex features of income dynamics and risk-sharing possibilities. These features of the environment can obscure the properties of the underlying lifetime income data we observe.[14]

Second, seemingly innocuous differences in the choice of interest rate can make a large difference in the level of lifetime inequality, how it evolves over time, and especially how it compares with cross-sectional inequality. This is because of the steep observed rise in both the level and dispersion of income in the first decade after a cohort enters the labor market. Higher interest rates effectively put more weight on income earned at younger ages. We prefer to treat income earned at all ages equally and focus on the most transparent possible measure of lifetime income.

some minimum income criteria. We have experimented with varying these minimum income thresholds and minimum years of labor market participation. Doubling or halving the required minimum has little impact on our results. We have also analyzed alternative ages ranges (30–60, 20–55, and 25–60) and obtained similar results.

[14]For example, Huggett and Kaplan (2011) and Huggett and Kaplan (2016) show that in the presence of tight borrowing constraints, the average return on human capital implied by correctly computed discount factors can be very high early in the working life, often above 30% or 40%, but in the absence of borrowing constraints, discount factors are very close to the risk-free rate.

3 Trends in Average Lifetime Income

In this section, we present our baseline findings with respect to trends in the average lifetime incomes of 27 consecutive cohorts. We label cohorts based on the year they turn 25, which we refer to as their year of labor market entry. Our analysis begins with the cohort that entered the labor market in 1957 and ends with the cohort that entered in 1983. We begin by analyzing how average lifetime income has evolved across cohorts for males and females separately, and the extent to which these differential patterns were driven by changes in lifetime labor market participation versus income growth conditional on working. We then examine the impact that these differential trends have on the population as a whole.

3.1 Lifetime Income for Men and Women

Starting with men, from the 1957 to the 1983 cohort, annualized mean lifetime income ($\overline{Y}^i$) rose by around \$10,000, from \$42,200 to \$52,200. This rise corresponds to a cumulative increase of 23.7%, or an average increase of 0.82% between two consecutive cohorts. However, the bulk of these gains—21.9% of the total 23.7%—accrued to only the first 10 or so of these cohorts. From the 1967 to the 1983 cohort, mean lifetime income increased by only 1.5% cumulatively.[15]

Median lifetime income for males has barely changed from the 1957 cohort to the 1983 cohort, only increasing by about \$250—or less than 1%. As with the mean, there are two distinct sub-periods: one from the 1957 to the 1967 cohort, where median lifetime income cumulatively rose by about 12.3%, and one from the 1967 to the 1983 cohort, where median lifetime income *fell* by over 10 percent. We will see that for almost all of the trends in lifetime income that we analyze, these two sub-periods—cohorts entering between 1957 and 1967 versus those entering between 1967 and 1983—represent two distinct phases. These findings for cumulative growth and average annualized growth in mean and median lifetime income are reported in the first panel of Table 1, along with the corresponding growth rates at selected percentiles of the lifetime distribution. We report lifetime income growth over the full period, as well as for the 1957 to 1967 cohorts and 1967 to 1983 cohorts separately.[16]

Table 1 shows that the stagnation of lifetime incomes for the cohorts since 1967 extends well beyond the median. Across almost the entire distribution of males, there have been

[15] In Section 3.5 we compare growth in mean lifetime income with various measures of growth in mean cross-sectional income from the SSA data, the CPS and NIPA.

[16] In Table A.1 and Table A.2 in Appendix A, we report mean and median lifetime income, together with selected percentiles of the lifetime income distribution for each cohort separately, for males and females respectively.

Table 1: Growth rates of cohort lifetime income, by gender

Cohorts		Averages		Selected Percentiles							
		Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
Males – PCE											
57–67	Cumulative	21.93	12.27	14.12	11.46	10.94	15.84	17.25	22.75	28.73	57.56
	Annualized	2.00	1.16	1.33	1.09	1.04	1.48	1.60	2.07	2.56	4.65
67–83	Cumulative	1.46	–10.34	–20.32	–19.77	–15.77	–1.33	2.29	9.98	13.22	17.48
	Annualized	0.09	–0.68	–1.41	–1.37	–1.07	–0.08	0.14	0.60	0.78	1.01
57–83	Cumulative	23.71	0.66	–9.07	–10.57	–6.55	14.29	19.93	35.00	45.76	85.11
	Annualized	0.82	0.03	–0.36	–0.43	–0.26	0.52	0.70	1.16	1.46	2.40
Males – CPI											
57–67	Cumulative	15.89	7.19	9.68	6.30	5.98	10.26	11.80	16.91	21.57	48.98
	Annualized	1.49	0.70	0.93	0.61	0.58	0.98	1.12	1.57	1.97	4.07
67–83	Cumulative	–7.54	–18.52	–27.46	–26.91	–23.58	–9.84	–6.61	0.06	3.56	6.99
	Annualized	–0.49	–1.27	–1.99	–1.94	–1.67	–0.65	–0.43	0.00	0.22	0.42
57–83	Cumulative	7.15	–12.65	–20.44	–22.31	–19.01	–0.58	4.40	16.98	25.90	59.40
	Annualized	0.27	–0.52	–0.88	–0.97	–0.81	–0.02	0.17	0.61	0.89	1.81
Females – PCE											
57–67	Cumulative	23.44	19.58	19.42	16.62	17.36	20.88	23.06	22.87	26.32	37.15
	Annualized	2.13	1.80	1.79	1.55	1.61	1.91	2.10	2.08	2.36	3.21
67–83	Cumulative	44.76	32.67	12.05	16.31	25.06	39.19	40.35	49.04	63.32	107.57
	Annualized	2.34	1.78	0.71	0.95	1.41	2.09	2.14	2.53	3.11	4.67
57–83	Cumulative	78.69	58.64	33.81	35.64	46.76	68.25	72.71	83.12	106.31	184.68
	Annualized	2.26	1.79	1.13	1.18	1.49	2.02	2.12	2.35	2.82	4.11
Females – CPI											
57–67	Cumulative	17.34	14.23	13.04	10.98	11.86	15.03	16.93	16.95	20.16	31.89
	Annualized	1.61	1.34	1.23	1.05	1.13	1.41	1.58	1.58	1.85	2.81
67–83	Cumulative	32.82	22.01	2.32	7.05	15.59	27.79	28.79	36.63	48.80	88.13
	Annualized	1.79	1.25	0.14	0.43	0.91	1.54	1.59	1.97	2.52	4.03
57–83	Cumulative	55.85	39.37	15.66	18.81	29.29	47.00	50.60	59.79	78.79	148.11
	Annualized	1.72	1.29	0.56	0.67	0.99	1.49	1.59	1.82	2.26	3.56

either trivial, or even negative, gains in lifetime income. As far up the distribution as the 75th percentile, real lifetime income for males fell between the 1967 and 1983 cohorts. The only part of the distribution to see significant lifetime income gains was the top 10% of the distribution, and even for that part, growth was much faster over the first 10 cohorts as compared with the latter 16 cohorts. This paints a bleak picture of male lifetime income stagnation for the vast majority of the distribution.

Women, on the other hand, have seen increases in lifetime income throughout the entire distribution. Median lifetime income increased nearly monotonically from $14,100 for the 1957 cohort to $22,300 for the 1983 cohort. This steady increase in lifetime income for women has been broad-based, with all parts of the distribution experiencing consistent lifetime income growth across cohorts. Median lifetime income for women grew at an average rate of 1.8% per cohort for the 27 cohorts from 1957 to 1983, with almost the exact same annualized growth rates for the 10 cohorts from 1957 to 1967 and the 16 cohorts from 1967 to 1983. The 10th percentile of the lifetime income distribution grew only slightly slower over this period, at an average of 1.2% cohort, while the 90th percentile grew slightly faster, at an average of 2.4% per cohort. At the very top of the distribution, lifetime income for women grew extremely fast – from the 1957 to 1983 cohorts, the 99th percentile nearly tripled (from $50,400 to $143,600), with an average increase of 4.1% per cohort.

Using the CPI rather than the PCE to convert nominal incomes to 2013 dollars lowers lifetime income growth for both men and women. The blue and black lines in Figure 1 show median lifetime income for males by cohort using the PCE and the CPI respectively, while the red and green lines show analogous figures for women. Using the PCE shows that lifetime incomes for males increased up until about the 1967 cohort and then declined. However, with the CPI, median lifetime income is largely flat until the 1957 cohort and then begins a steep decline. The second panel of Table 1 presents the changes between males' lifetime incomes across cohorts after deflating with the CPI for the other percentiles of the distribution. As with the median, deflating with the CPI reduces the lifetime gains experienced by the first 10 cohorts, and exacerbates the lifetime income losses felt by the second set of cohorts across the distribution: even the 99th percentile of males experienced about half a percent of lifetime income growth by cohort. For women, deflating with the CPI reduces the growth rates but does not erase the broad gains in lifetime income.[17]

3.2 Extensive and Intensive Margins

Lifetime income growth can come from either an increase in lifetime labor market participation (the extensive margin) or an increase in income while working (the intensive margin). For women, the growth in lifetime income from the 1957 cohort to the 1983 cohort was driven by both margins. The changes in lifetime participation across these cohorts can be seen in Figure 2a, which displays the mean number of years worked for individuals in each cohort. We define an individual as working in a given year if he or she has income

[17] Tables A.3 and A.4 in Appendix A show the selected moments of the lifetime income distribution by individual cohort for males and females, respectively, using the CPI.

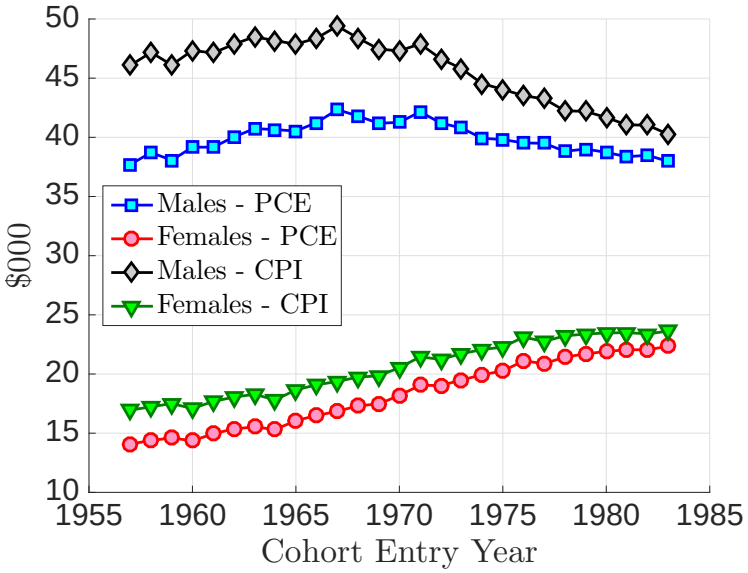
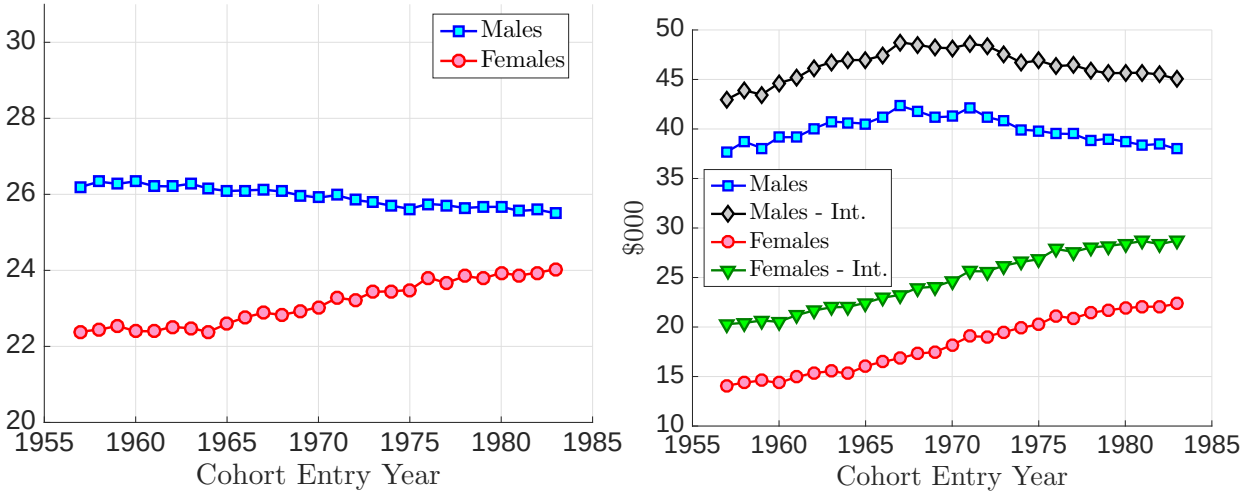


Figure 1: Median Lifetime Income by Cohort and Gender

above the minimum income threshold, $\underline{Y}_t$ in that year. Recall that all individuals in our sample satisfy this threshold in at least 15 of the 31 possible years, so we are already conditioning on people with at least some attachment to the labor force. Even among these women who work at least 15 years, the average number of years worked between the 1957 and 1983 cohorts increased by about 1.6 years. Most of this increase comes from an increase in the number of years worked at young ages. From the 1957 to the 1983 cohorts, women in our sample worked an average of 1.8 additional years between the ages of 25 and 34, 0.2 additional years between the ages of 35 and 44, and 0.4 fewer years between the ages of 45 and 54.

Conditional on working, lifetime income for women also increased dramatically.[18] We measure the importance of this intensive margin by constructing an alternative measure of lifetime income in which we divide an individual's total income by the number of years in which he or she has income above the minimum threshold, rather than by 31. The median of the intensive margin of lifetime income for each cohort is shown by the black and green lines in Figure 2b. For comparison, the blue and red lines in Figure 2b show overall median lifetime income by cohort. Median lifetime income conditional on working is mechanically higher than overall median lifetime income, by around $5,000 per year, and

[18]Since our data measure only annual income, we cannot measure workforce participation *within* a year. Changes in weeks or hours worked within a year are necessarily captured by the intensive margin in our data. We also cannot distinguish changes in average hours worked from changes in average wages per hour.



(a) Number of years worked by cohort and gender (b) Median lifetime income by cohort and gender, extensive and intensive margins

Figure 2: Lifetime Income by Cohort, Extensive and Intensive Margins

increases roughly in parallel to overall lifetime income. Expressed as growth rates, this finding implies that between the 1957 to 1983 cohorts of women, median lifetime income conditional on working grew by less (42%) than median total lifetime income (59%). The comparison between growth in the intensive margin versus the overall measures of lifetime income is similar in other parts of the distribution. These growth rates are contained in Table A.5 in Appendix A, which is analogous to Table 1 but is based only on income conditional on working. We also report mean and median lifetime income conditional on working, together with selected percentiles of the intensive margin of the lifetime income distribution, for each cohort individually in Table A.6 in Appendix A.

For men, the decline in lifetime income conditional on working is much more important than the decline in the number of years worked for explaining the stagnation of lifetime incomes since 1967. Figure 2a shows that the average number of years worked declined by less than one year from the 1957 cohort to the 1984 cohort, while Figure 2b shows that for the cohorts since 1967, the decline in median lifetime income at the intensive margin is roughly similar to the overall decline in median lifetime income. From the 1967 to 1983 cohorts, median lifetime income declined by 10.3% (Table 1), while median lifetime income conditional on working declined by 7.2% (Table A.5 in Appendix A).

Table 2: Growth rates of cohort lifetime income

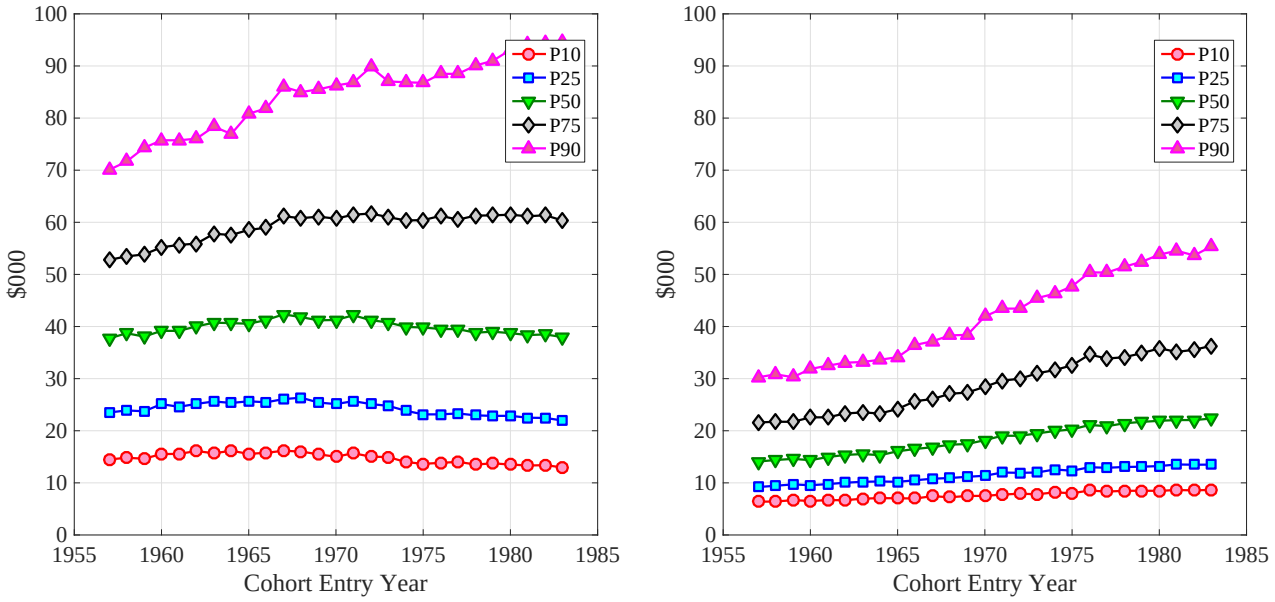
Cohorts		Averages		Selected Percentiles							
		Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
PCE											
57–67	Cumulative	17.90	9.02	13.62	11.81	10.20	11.56	12.25	15.98	21.33	51.91
	Annualized	1.66	0.87	1.29	1.12	0.98	1.10	1.16	1.49	1.95	4.27
67–83	Cumulative	6.53	0.12	2.01	3.73	2.10	–0.72	1.30	9.92	14.05	10.67
	Annualized	0.40	0.01	0.12	0.23	0.13	–0.04	0.08	0.59	0.83	0.64
57–83	Cumulative	25.60	9.15	15.90	15.98	12.51	10.76	13.71	27.49	38.37	68.12
	Annualized	0.88	0.34	0.57	0.57	0.45	0.39	0.50	0.94	1.26	2.02
CPI											
57–67	Cumulative	12.04	3.73	8.48	6.19	4.66	6.33	6.77	10.40	15.53	44.49
	Annualized	1.14	0.37	0.82	0.60	0.46	0.62	0.66	0.99	1.45	3.75
67–83	Cumulative	–2.78	–8.95	–6.49	–4.17	–6.34	–9.80	–7.77	0.08	3.95	0.57
	Annualized	–0.18	–0.58	–0.42	–0.27	–0.41	–0.64	–0.50	0.01	0.24	0.04
57–83	Cumulative	8.92	–5.56	1.44	1.77	–1.98	–4.10	–1.52	10.49	20.10	45.32
	Annualized	0.33	–0.22	0.05	0.07	–0.08	–0.16	–0.06	0.38	0.71	1.45

3.3 Lifetime Income for the Whole Population

Looking at the population as a whole, we find the trends for men and women combine in sometimes offsetting ways. As with men separately, we still see larger increases in the mean of lifetime income in the first sub-period, with nearly three-quarters of the lifetime income growth from the 1957 to 1983 cohorts occurring among the first 10 cohorts. These findings for cumulative growth and average annual growth in mean, median, and selected percentiles of lifetime income for the full period, as well as for the 1957 to 1967 cohorts and the 1967 to 1983 cohorts separately, are reported in Table 2. As seen here, the stagnation of lifetime incomes for the post-1967 cohorts extends up to the 75th percentile. Even at the 90th percentile, average growth was only around 0.59% per cohort, compared with growth of 1.49% per cohort for the preceding cohorts. For over three-quarters of the distribution, lifetime income growth was essentially flat or declining across these 17 cohorts.[19]

The general stagnation of lifetime incomes for the majority of the distribution results from a combination of the opposing trends for men and women, together with their general positions in the overall population's lifetime income distribution. Given that men largely

[19]In Table A.7 in Appendix A, we also report mean and median lifetime income, together with selected percentiles of the lifetime income distribution, for each cohort individually.



(a) Males (b) Females

Figure 3: Selected Percentiles of Lifetime Income, by Cohort and Gender

experienced losses in lifetime income over this time period while women experienced large gains, there has been a narrowing of the lifetime earnings gap.

Comparing the median income of males and females from Figure 1, we see that the difference between the median male and female lifetime earnings has narrowed over time, from the 1957 cohort in which the median female's earnings were 37% of the earnings of the median male, to the 1983 cohort in which the median female's earnings were almost 60% of the earnings of the median male. We see similar trends comparing other points of the gender-specific distributions over these cohorts. These comparisons can be seen in Figure 3. However, given that women started from such low levels of lifetime income (for example, almost 95% of females in the 1957 cohort earned less in lifetime income than the median male), gains in female lifetime income across cohorts largely serve to shore up the bottom of the distribution.

Using the CPI rather than the PCE to convert nominal incomes to 2013 dollars paints an even bleaker picture of lifetime income growth for the population as a whole. Figure 4 displays median lifetime income for each cohort using the two deflators. Whereas deflating with the PCE results in median lifetime income rising until around the 1967 cohort and remaining flat thereafter, deflating with the CPI results in median lifetime income being

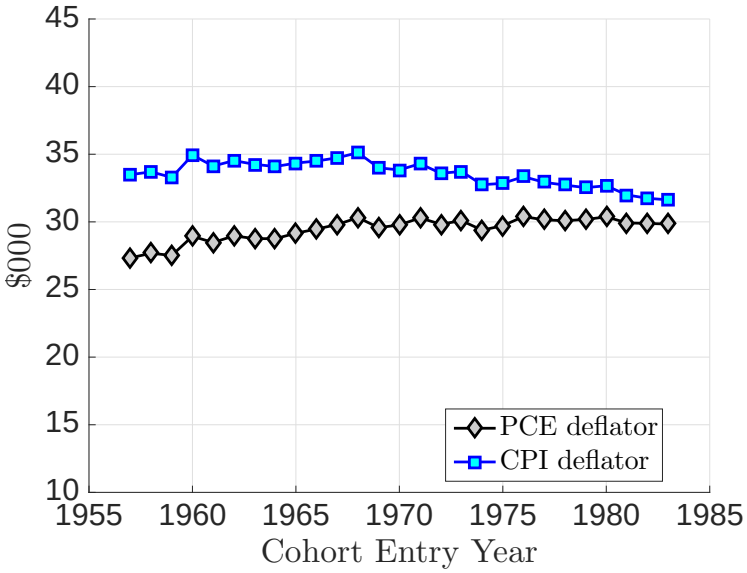


Figure 4: Median Lifetime Income by Cohort

essentially flat even before 1967 and then declining by around 9% between the 1967 and 1983 cohorts. In the bottom panel of Table 2, we report cumulative lifetime income growth for the two sub-periods using the CPI at other percentiles of the lifetime income distribution. Real lifetime incomes deflated with the CPI declined between the 1967 and 1983 cohorts for nearly 90% of the distribution, with even the top decile of the distribution experiencing single-digit cumulative income gains over these 16 cohorts.

3.4 Non-wage benefits from employment

During the period covered by our data, employer-provided health care and pension benefits have risen substantially. Thus, it is reasonable to ask whether this increase has partly offset the decline in wage and salary income documented above, in which case the trends in *total* employee compensation (i.e., wage plus non-wage) might look different from the trends in wage compensation.[20] Since the SSA data do not include non-wage benefits for employees, we cannot undertake a full analysis of this question. Instead, we use aggregate data from the national income and product accounts (NIPAs) to estimate an upper bound

[20]Two related trends during this period could be offsetting these increasing benefits (or could perhaps be driving the increase). First, because life expectancy was rising during this period, an increase in pension benefits is necessary simply to prevent the consumption of retirees from declining. Second, some evidence suggests that, because of rising health care costs, the inflation rate is higher for the elderly than is implied by the CPI. Therefore, not all the rise in non-wage benefits constitute additional lifetime resources for newer cohorts as assumed in the calculations that follow.

on the effect of non-wage benefits for the trends we have documented for the median worker. Our approach is to measure the mean (average) lifetime non-wage benefit per worker for each cohort over this period. A large empirical literature has documented that *inequality* in non-wage benefits across employees has increased substantially since at least the early 1980s, implying that the increase in mean benefits per worker is an upper bound for the increase in benefits for the median worker.[21]

For comparability with our SSA baseline sample, which excludes public sector employees, we use data on health care and pension benefits provided by employers in private industries as reported in the NIPAs.[22] Since 1957 the relative benefit mix has shifted strongly toward health care, with its share rising from 15% of total employer-provided non-wage benefits in 1957 to 52% in 2013, and away from pension contributions whose share fell from 70% to 40% during the same period.[23] The sum of these two components has consistently made up about 90% of total non-wage benefits, which suggests that our analysis based on these two components should provide a good benchmark for the effects of all non-wage benefits.

Figure 5a plots "real employer contributions to employee pension funds and group health insurance for private industries" divided by the annual average number of private industry workers from the BLS Employment Situation. Non-wage compensation per worker has grown from $1,500 per worker in 1957 to about $6,300 per worker in 2013. The growth in non-wage benefits was faster from 1957 to the early 1990s, followed by a U-shape in the 1990s and a significant slowdown since the early 2000s. We compare lifetime average benefits across cohorts by computing average benefit amounts over the 31-year life cycle of each cohort. These are displayed in Figure 5b. For example, the data point corresponding to the year 1957 is the average annual employer contributions per worker from 1957 to 1987. Lifetime benefits have risen from about $3,300 per year for the 1957 cohort to about $5,800 per year for the 1983 cohort. The increase from the 1967 to 1983 cohorts was slower, from

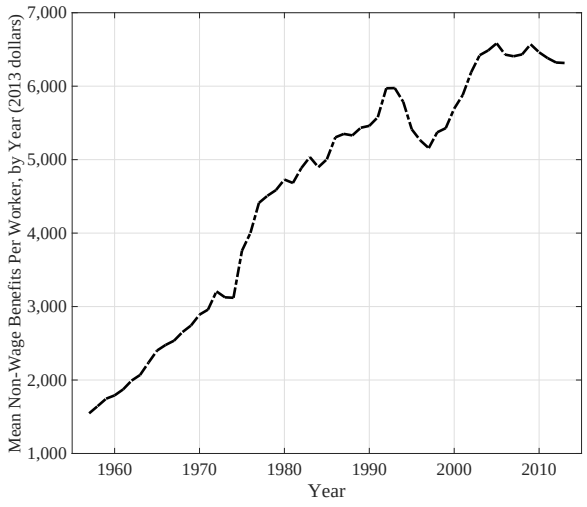
[21] See, for example, Pierce (2001) and Gruber and McKnight (2003). An important driver of this increase in inequality of non-wage benefits is the decline in the take-up rate of employer-provided insurance for low-income employees starting in the 1980s.

[22] Since health care services have experienced faster inflation than the overall economy during this period, we would ideally deflate the health-care component of this series using a price deflator that is specific to health services. However, for private industries, NIPA reports only the combined value of both health care and pension benefits. We thus deflate the total value of benefits with a composite price deflator that is constructed as a weighted average of the PCE deflator and the health care price deflator, with weights that correspond to the relative shares of each component in total benefits (public sector plus private industries), with 2013 as the base year.

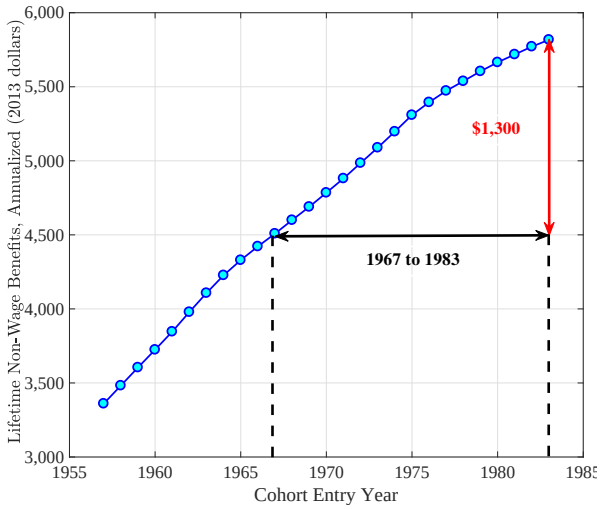
[23] Pension plans include both private and government employee pension plans. However, since we include only contributions from private industry employers, government employee pension plans are a very small component.

Figure 5: Employer-provided Benefits per Worker

(a) Real employer contributions to pension and group health insurance per worker



(b) Real lifetime value non-wage benefits, annualized, by cohort

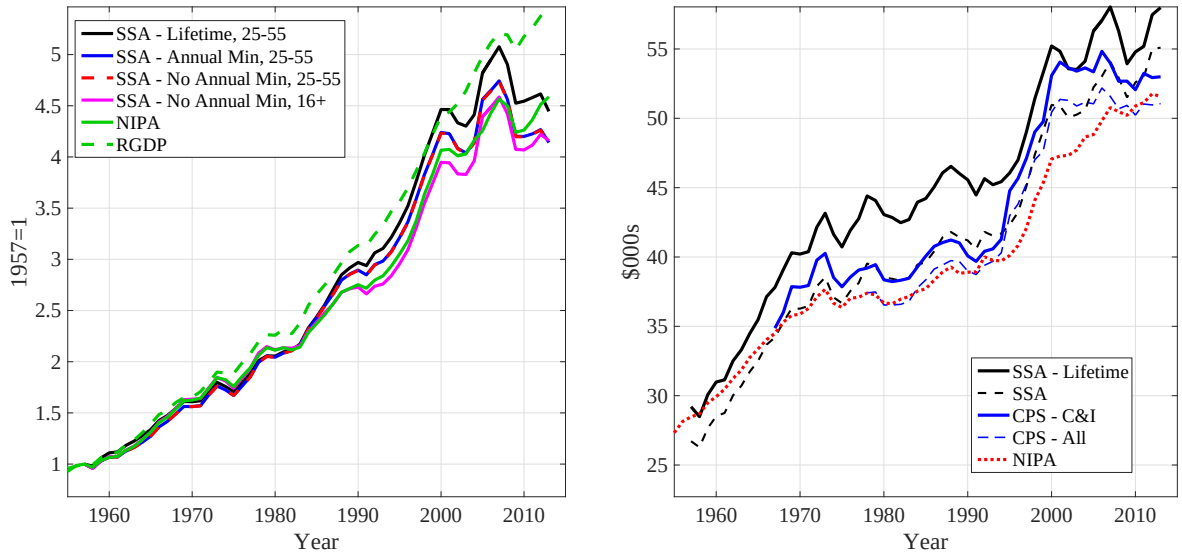


an annualized value of $4,500 to $5,800 per worker. Given the increase in benefits inequality noted above, this average increase is a reasonable upper bound for the increase in benefits for the median worker.

A back-of-the-envelope calculation demonstrates that including the increase in non-wage benefits mitigates the decline in lifetime income but does not overturn the conclusions from the previous sections. Specifically, using the PCE-deflated earnings measures, the annualized value of median lifetime wage and salary income for male workers declined by $4,400 per year from the 1967 cohort to the 1983 one, equivalent to $136,400 over the 31-year working period (Table A.1). With our estimates of mean non-wage benefits included, this decline falls to $3,100 per year, equivalent to $96,100 over the 31-year working period.. Using the CPI-deflated measures reveals an even bleaker picture: a loss of $9,150 per year in wage and salary income (Table A.3), equivalent to $283,650 over the 31-year working period, or $7,850 when mean non-wage benefits are included, equivalent to $243,350. Recalling that the added benefit amount is likely to be an upper bound suggests that the true loss falls between these two values.

3.5 Comparison with Aggregate Income Growth

In this section, we compare average income growth in our sample with publicly available data from NIPA and the CPS. From 1957 to 2013, real GDP (shown by the dashed green



(a) Aggregate Income Growth, Various Sources (b) Mean Income per Worker, Various Sources

Figure 6: Comparison with Alternative Data Sources

line in Figure 6a) grew by a factor of nearly five-and-a-half, while real wage and salary income recorded in NIPA (shown by the solid green line in Figure 6a) grew by a factor of four – with most of the difference in growth between the two series taking place since 2000.

Given this large growth in aggregate income, one might be concerned that the stagnation in lifetime income that we have documented for the cohorts in the labor market during this period is a peculiarity of the measure of income that our lifetime statistics are based on—W2 income for 25 to 55 year old workers in commerce and industry sectors who satisfy minimum lifetime income criteria. But the black line in Figure 6a shows that the growth in the total income accrued by individuals in our baseline sample is essentially the same as the growth in wage and salary income from NIPA. Hence the stagnation in lifetime incomes we document is not because we chose a measure of income, or sample of individuals, that showed little total growth over the period. To further underscore this point, the blue, red and pink lines show that when we broaden the sample to include individuals that (i) do not meet the lifetime minimum income requirement, (ii) do not meet the annual minimum income requirement, and (iii) are outside the 25-55 age range, the total income growth in our sample lines up even more closely with the NIPA wage and salary measure.

Figure 6b shows how mean annual income in our baseline SSA sample (black solid line) compares with mean annual income for individuals aged 25 to 55 from other data sources

and samples, over the period 1957 to 2013. First, the black dashed line shows mean annual income when individuals are selected based on an annual income criterion, rather than a lifetime criterion. Average incomes are higher with the lifetime selection criterion but the overall income growth over the period is essentially the same. Second, the blue solid line plots mean annual income for Commerce and Industry workers in the CPS (applying the same selection criteria as in the SSA data); comparing this line with the black dashed line shows the effect of measuring annual income in the SSA data versus the CPS. Third, the blue dashed line shows mean annual income in the CPS for all workers, not just those in Commerce and Industry sectors; comparing this line with the blue solid line shows the effect of focusing only on Commerce and Industry workers. Fourth, the red dashed line is mean wage and salary income per person aged 25 to 55 from NIPA. Overall, we see that aggregate growth in mean incomes has been, if anything, larger in our baseline SSA sample than implied by NIPA over this period.

How then can we reconcile with the growth in aggregate income from 1957 to 2013 with the stagnant lifetime incomes for the cohorts of individuals who were in the labor market over this same period? The key takeaway from Figure 6 is that there is nothing particularly unusual about the time-series for our income measure or sample. Rather, it is the lifetime perspective that drives the different conclusion about income growth over this period. The growth in mean cross-sectional income masks large shifts in how income gains are split between people of different ages (and hence cohorts) and between people in different parts of the income distribution. Much of the increase in income in Figure 6 has accrued to older workers in older cohorts. In the remaining three sections of the paper we delve into these distributional shifts in more detail.

4 Trends in Life-Cycle Income Profiles

The decline in lifetime incomes for recent cohorts of men documented in Section 3 could in principle be attributed to lower income at young ages, lower income at older ages, or both. Similarly, the rise in lifetime income for females may be attributed to higher income at young ages, higher income at older ages, or both. In order to dissect these changes, in this section we explore how life-cycle profiles of average incomes have changed over time.

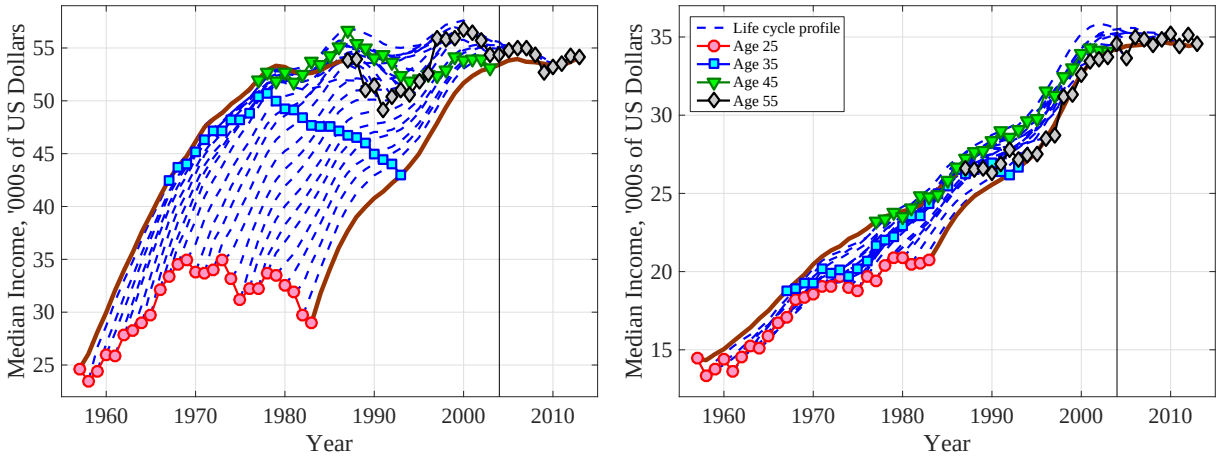
4.1 Changes in the Life-Cycle Profile of Income for Men

In Figure 7, we plot median income in each year for each of the 27 cohorts of workers, separately for males and females.[24] The colored dots connect income at common ages across cohorts, thus showing how the median income of particular age groups has changed over time. In Figure B.1 in Appendix B, we report analogous plots of the profiles of mean log income for each cohort.

For men, the general shape of the life-cycle profile is similar for all cohorts (Figure 7a). Median incomes start low and rise sharply from ages 25 to 45, and then remain roughly constant from ages 45 to 55. Remarkably, however, the magnitude of this increase in incomes between ages 25 and 45 has declined sharply for the post-1967 cohorts. There has been a steady decline in median income at ages 25 and 35 (see the path of red circles and blue squares), without any offsetting increase in median income at ages 45 and 55 (see the path of green triangles and gray diamonds). Thus, the decline in lifetime income for these recent cohorts is almost entirely attributed to income falling at young ages rather than at older ages. Moreover, the decline in median income at young ages was substantial. Using the PCE deflator, median income at age 25 has declined from $33,300 for the 1967 cohort to only $29,000 for the 1983 cohort. At age 35, median income has dropped from $50,600 for the 1967 cohort to $42,400 for the 1983 cohort. Using the CPI as a measure of inflation, these declines are even larger.

In Table B.1 in Appendix B, we report the cumulative growth in median income between ages 25 and 35, 35 and 45, and 45 and 55 for each cohort. As Figure 7a suggests, the biggest changes in these growth rates were for the first 10 years in the labor market, from ages 25 to 35. For the 1957 cohort, cumulative growth in median income between ages 25 and 35 was 71%; for the 1967 cohort, cumulative growth was 52%; and for the 1983 cohort, it was 46%. The drop in income growth over this age range between the 1957 and 1967 cohorts (71% to 52%) was more than compensated for by the sharp rise in median income at age 25, so that lifetime incomes grew substantially between these two cohorts, as we have already seen. However, between the 1967 and 1983 cohorts, when median income at age 25 was sharply declining, income growth in the first years in the labor market continued to fall (from 52% to 46%). It is the combination of declining income at entry and weak income growth during the first decade that accounts for the overall stagnation of median male lifetime income

[24] The life-cycle profiles of median income in Figure 7 and Figure 9 are not the same as the life-cycle profile of income for the individual at the median of the lifetime income distribution. In practice, however, the two are very similar.



(a) Males (b) Females

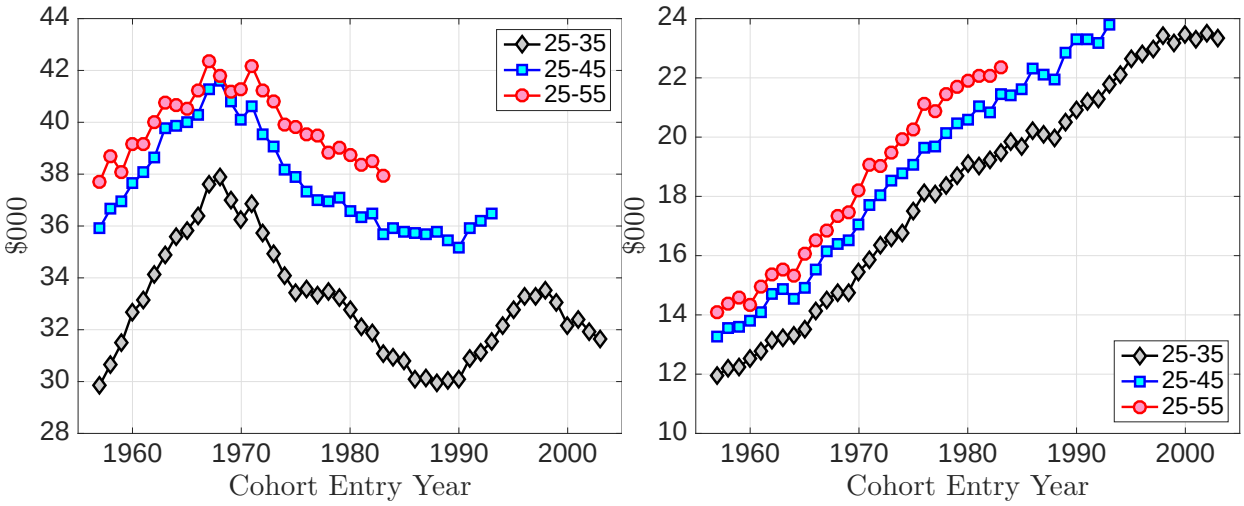
Figure 7: Age Profiles of Median Income by Cohort

since the 1967 cohort.

One might have thought that the overall stagnation of lifetime incomes for men is simply a reflection of weak labor market conditions in the 2000s, since the post-1967 cohorts that experienced little or negative growth in lifetime income all have in common that they spent part of their working lives during the 2000s. It is well documented that aggregate income growth was anemic in the early 2000s and declined substantially in the wake of the Great Recession and subsequent slow recovery. But these changes in the life-cycle profile of median income suggest that the declining lifetime incomes for recent cohorts of males do not simply reflect the poor economic conditions in the 2000s.

4.2 Changes in the Life-Cycle Profile of Income for Women

For women, life-cycle profiles are more linear than for men, particularly for earlier cohorts who were in the labor market at a time when women's income was growing rapidly. For the 1957 cohort, for example, median income grew by 28% between ages 25 and 35 (from \$14,500 to \$18,500), by 25% between ages 35 and 45 (from \$18,500 to \$23,100), and by 15% between ages 45 and 55 (from \$23,100 to \$26,600). For later cohorts of women, the shape of the life-cycle profile looks more similar to the typical male profile, with a significant leveling off at older ages. For the 1983 cohort, median income also grew by 29% between ages 25 and 35 (from \$20,700 to \$26,700), by 29% between ages 35 and 45 (from \$26,700 to \$34,300), but by less than 1% between ages 45 and 55 (from \$34,300 to \$34,500). These growth rates are reported for all cohorts in Table B.1 in Appendix B. They show that while



(a) Males (b) Females

Figure 8: Median Income by Cohort, Including Younger Cohorts

income growth at young ages has remained roughly constant for women, there has been a steady decline in income growth at older ages, concentrated mostly among the cohorts entering from 1978 onward. This changing shape of the median life-cycle income profile for women can also be seen in Figure 7b by comparing the sustained income growth at ages 25 and 35 (see the path of red circles and blue squares) with the decelerating growth at ages 45 and 55 (see the path of green triangles and gray diamonds). For the youngest cohort of women for whom we have full data, the shape of the life-cycle profile closely resembles the profile for men, at a substantially lower level.

4.3 Looking Ahead to Recent Cohorts

So far we have examined only those cohorts that are old enough for us to observe the full 31 years of income from ages 25 to 55. The recent picture we have painted for these cohorts is bleak: lifetime incomes have been stagnant for men, and lifetime income growth for women has slowed. Are these trends likely to reverse or to continue for younger cohorts of workers? The previous section argued that understanding income at young ages, between 25 and 35, is particularly important for understanding lifetime incomes. We can use this connection to gain insight into the likely path of lifetime incomes for future cohorts, by looking at the early labor market experience of younger cohorts for whom we cannot observe the full 31 years of income but can observe income at younger ages.

Figure 8 shows median total income over the 11 years from ages 25 to 35, the 21 years

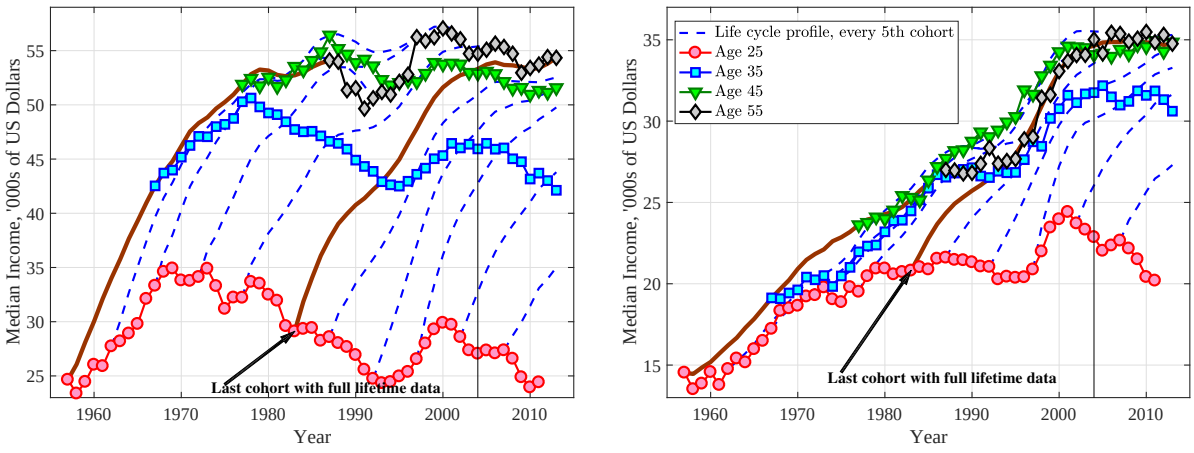
from ages 25 to 45, and the 31 years from ages 25 to 55 for each cohort from 1957 to 2003.[25] For the more recent cohorts, only the younger age ranges are available. For each age range, we annualize the income by dividing by the number of years in the age range; hence the 25- to 55-year measure is the same as in our baseline measure of lifetime income. For the cohorts where all three measures are available, the trends in median total income are very similar for all three age ranges.

For men, median total income earned in the 11 years from ages 25 to 35 follows a trend across cohorts that is similar to the trend in lifetime income, but is substantially more pronounced (Figure 8a). Between the 1957 and 1967 cohorts, median total income in these early labor market years increased by 26% (from $29,900 to $37,600), and then declined by 17% from the 1967 to 1983 cohorts (from $37,600 to $31,100). These swings are consistent with the inference of the previous section that trends in income at young ages are particularly informative about trends in lifetime income. For more recent cohorts entering the labor market after 1983, the stagnation in income during the early labor market years has continued. Median total incomes from ages 25 to 35 hit a low of $29,900 for the 1988 cohort, after which time the trend started to reverse. However, the resurgence was cut short with the onset of the 2007-8 recession, and for the cohorts from 1998 onward, median total income over this age range has again been declining. For the 2003 cohort, which is the most recent cohort for which we have data, median total income over ages 25-35 is still 16% below the level of the 1967 cohort.

For women, Figure 8b shows that the approximately linear increase in lifetime incomes between the 1967 and 1983 cohorts is echoed in the average incomes earned between ages 25 and 35. This growth continued for more recent cohorts, up until the cohort entering in 1998, after which time the median early career incomes have flattened. It is difficult to know whether this flattening is part of a trend or is a temporary consequence of the 2008-9 recession and slow recovery.

In Figure B.2 in Appendix B, we report the mean, median, and selected percentiles of the distribution of total income over ages 25 to 35 for each cohort individually, for men and women, respectively. The stagnation of male incomes during the first decade in the labor market extends across the entire distribution. Lower down the distribution, the declines

[25] When analyzing full cohorts, we restricted the sample to individuals that met the minimum income criteria in at least 15 of the 31 possible years. This is not possible when analyzing younger cohorts. In order to maintain comparability, we include an individual from one of the partial cohorts if he or she meets the minimum income criterion in at least half of the specified age range. For example, for the 25-35 age range, the sample is restricted to those that met the minimum income criterion in at least 6 of the 11 possible years.



(a) Males (b) Females

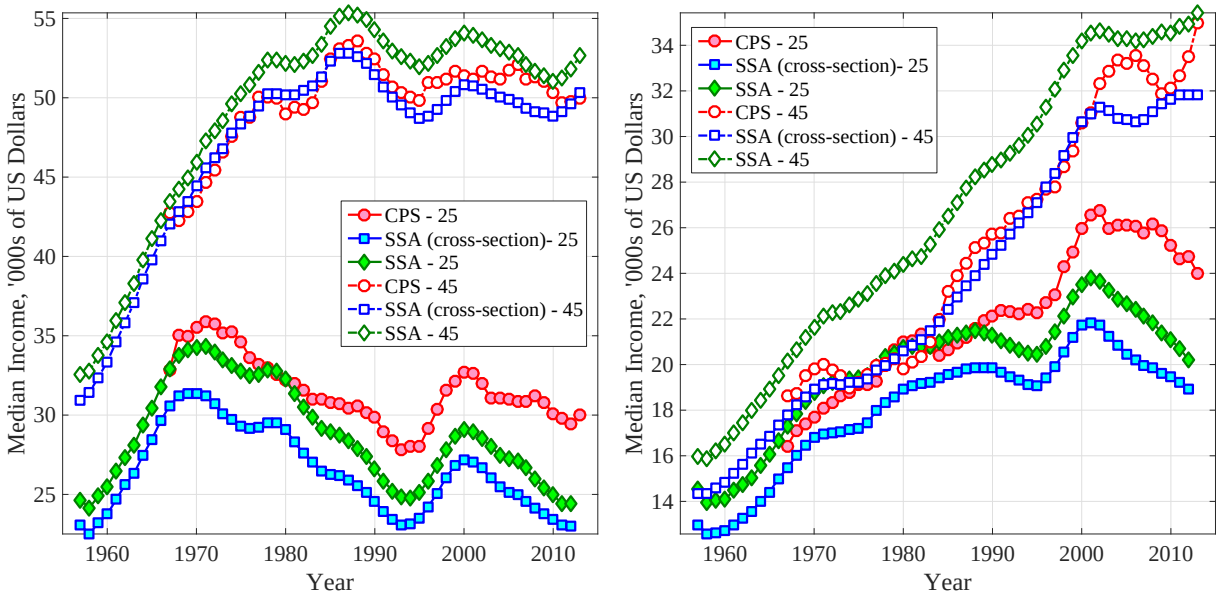
Figure 9: Age Profiles of Median Income by Cohort

are even larger than at the median: the 25th percentile of the distribution of ages 25 to 35 income is 28% lower for the 2003 cohort than it was for the 1967 cohort. Further up the distribution, early career income has increased, although the gains have been modest: the 90th percentile of the distribution increased by 28% across these 36 cohorts, equivalent to an increase of just 0.70% per cohort.

We can obtain a more complete picture of median income growth at young ages by extending the median income profiles from Figure 7 to include all cohorts for whom we have any data. These profiles are shown in Figure 9a for men and in Figure 9b for women. In both figures, the most important features are the pattern of median incomes for young workers. For men, the decline in median income at age 25 continued until 1993, after which time there was a brief resurgence followed by another period of decline. In 2009, median incomes for 25 year old males was at its lowers point since 1958. For women, the median income at age 25 was essentially flat from 1979 until 1997, after which time it briefly increased but by 2011 had returned to its 1979 level.

4.4 Comparison with the CPS

The life-cycle profiles for median income in Figure 7 and Figure 9 make only limited use of the panel dimension of the SSA data. Were it not for the fact that our minimum income sample selection criterion is based on lifetime income rather than on annual income, it would be possible to produce analogues of these figures with only cross-sectional data. In Figure 10, we compare the trends in median incomes at age 25 and age 45 from the CPS



(a) Males (b) Females

Figure 10: Median Income by Age and Cohort, SSA vs CPS

(red lines), with two versions of these trends from the SSA data (Figure B.3 in Appendix B shows the analogous plots for ages 35 and 55).[26] The green lines show median income in the SSA data as reported in Figure 7 and Figure 9, that is, using the lifetime income selection criterion. The blue lines show median income in the SSA data but imposing the same annual minimum income criterion as for the CPS, that is, treating the SSA data as a cross-sectional survey.

For income at age 45 (dashed lines), the CPS and SSA produce very similar paths for median income when the SSA is treated as a cross-sectional survey like the CPS, with the caveat that in recent years, median incomes in the SSA are a little below those in the CPS, particularly for women. Both data sets yield substantially lower levels of median income than when individuals are selected based on lifetime income (green lines). The is because

[26]The sample for the CPS data is selected to be as close as possible to the SSA data, but with a minimum income selection criterion based on annual income. Our measure of income from the CPS is wages and salaries. We include only "commerce and industry workers" by omitting workers with industry codes corresponding to agriculture, forestry, fisheries, hospitals, education services, welfare services, nonprofits, private households, and public administration. Unlike in the SSA data, in the CPS it is possible to compute analogous statistics for workers in industries other than commerce and industry. Figure B.4 in Appendix B plots the analogous trends in median incomes at different ages with and without this restriction. The trends look virtually identical.

a nontrivial fraction of individuals have no income in a single year, even though they are sufficiently attached to the labor market over their lifetime to meet our lifetime selection criteria (at least 15 years with income above an annual income threshold and total lifetime income above a lifetime income threshold). Since the cross-sectional perspective ignores these individuals, median income is understated relative to the lifetime perspective. As expected, this distinction is more important for women than for men.

For income at age 25 (solid lines), the distinction between the cross-sectional perspective and the lifetime perspective is also important, since this is also an age during which some individuals have very low earnings, even though they will go on to be substantially attached to the labor market over the remainder of the lifetime. Hence, the green lines are above the blue lines for both men and women. However, unlike at age 45, at age 25 there is a large difference between median incomes as measured in the CPS (red lines) compared with median incomes in the SSA when treated as a cross section (blue line), possibly because of income overstatement among low-income households in the CPS. Despite these differences in levels, the general trends are the same in the three data sets.

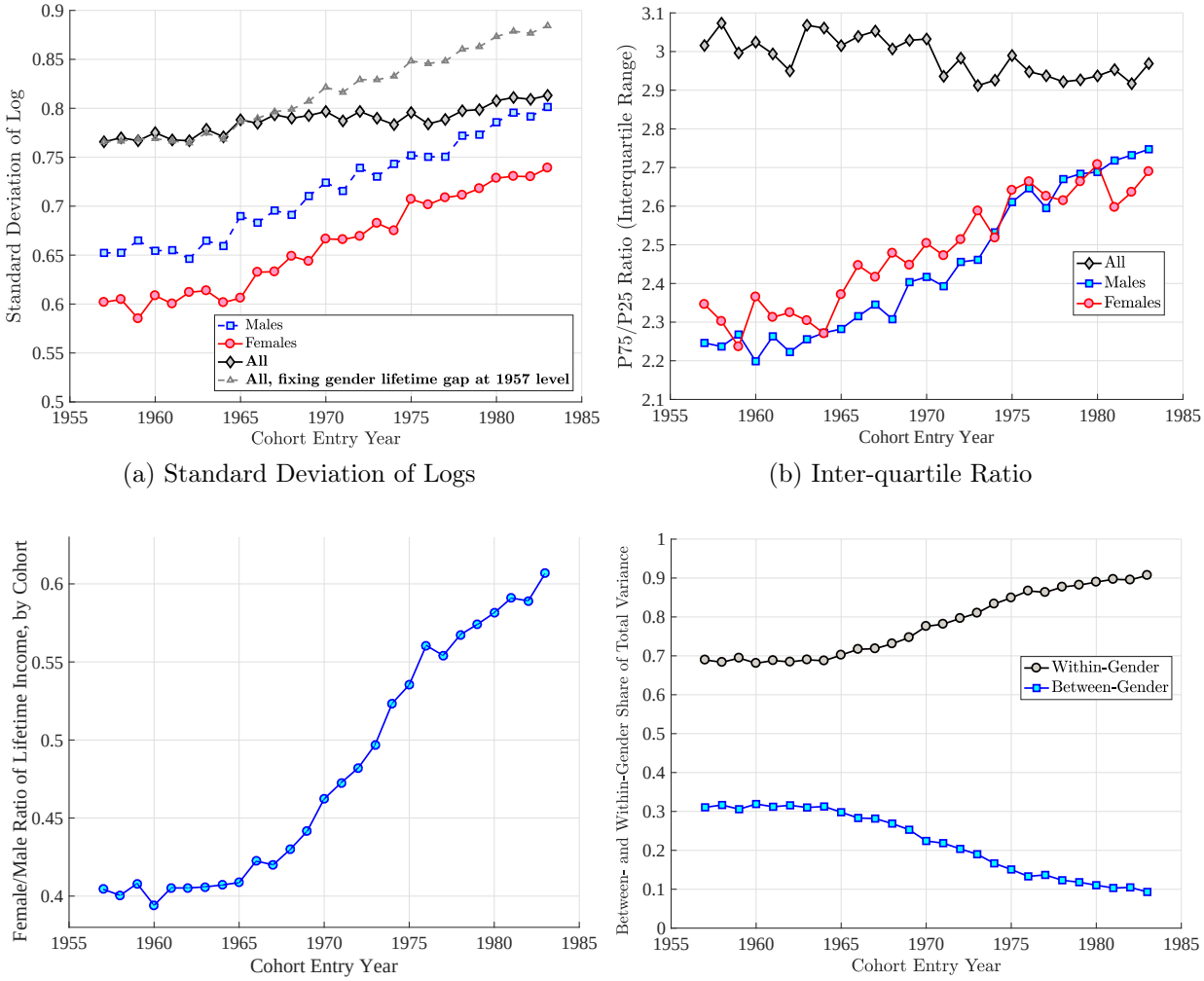
5 Trends in Lifetime Income Inequality

In this section, we examine trends in lifetime inequality across cohorts within gender groups and in the whole population.

5.1 Lifetime Inequality across and within Genders

The top two panels of Figure 11 plot two common measures of lifetime inequality: the standard deviation of log lifetime income (11a) and the interquartile ratio (i.e., P75/P25, hereafter IQR) of lifetime income (11b) for each of the 27 cohorts. The blue lines marked with squares correspond to lifetime inequality among men, the red lines (circles) correspond to lifetime inequality among women, and the black lines (diamonds) correspond to the combined population of men and women.

The first observation is that lifetime income inequality – as measured by these two statistics – showed little to no rise in the whole population despite rising significantly *within* each gender group. Specifically, for the whole population, the standard deviation of lifetime income increased modestly, from about 0.77 to about 0.81 from the 1957 cohort to the 1983 cohort, whereas the IQR was mostly flat at a value of around 3. In contrast, inequality rose strongly within each gender group (and by very similar magnitudes): the standard



(a) Standard Deviation of Logs

(b) Inter-quartile Ratio

(c) Mean Gender Lifetime Income Gap (Ratio)

(d) Between- vs. Within- Gender Variance Share

Figure 11: Cohort Lifetime Inequality, Overall and by Gender

deviation rose by about 15 log points within each gender group, and the IQR rose from about 2.3 to 2.7.

How do we reconcile these contrasting results? The answer lies in the closing of the gender gap *in lifetime income*. This can be seen in Figure 11c, which plots the ratio of the mean lifetime income of females to that of males for every cohort during this period. For entry cohorts before 1965, the gender gap was stable, with women in these cohorts earning on average 40% of the lifetime income of men. After 1965, the gap started to close quickly (showing an almost linear trend), and by the 1983 cohort, the lifetime income of women

reached more than 60% of their male counterparts.[27]

To quantify the contribution of this trend to mitigating the rise in overall lifetime inequality, a simple variance decomposition is helpful. Let $\overline{y}_t^{i,g} = \ln \overline{Y}_t^{i,g}$ denote the log lifetime income of individual i of gender $g = m$ or f, and π_t^g denote each gender's population share in cohort t. We have

$$\text{var}(\overline{y}_t^i) = [\sum_{g=m,f} \pi_t^g \times \text{var}(\overline{y}_t^{i,g})] + [\sum_{g=m,f} \pi_t^g \times ((E(\overline{y}_t^{i,g}) - \overline{\overline{y}}_t)^2],$$

where $\overline{\overline{y}}_t$ is the average of $\overline{y}_t^{i,g}$ taken over the two gender groups. The first term is the average variance of log lifetime income within each gender group. This component has grown strongly, as seen in Figure 11. The second term captures the dispersion in the mean log lifetime income across gender groups, which has shrunk over time, as seen in Figure 11c, thereby offsetting the increase in the (within-gender group variance) terms in the first set of brackets.

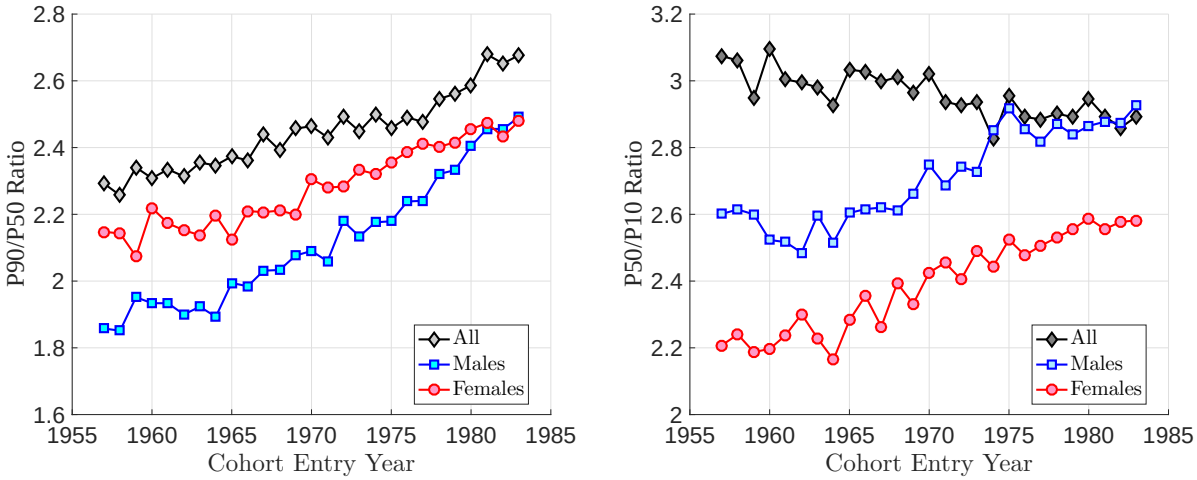
The share of each of the two terms in the overall variance is plotted in the bottom right panel (Figure 11d): the lifetime gender gap was responsible for 31% of the total variance in the population for cohorts before 1965, but this fraction dropped to 9% by the 1983 cohort. In the top left panel (Figure 11a), we plot the counterfactual standard deviation for the whole population (gray dashed line marked with triangles) if the gender gap had remained at its 1957 level throughout the sample period. As seen here, the standard deviation would have risen by 12 log points rather than 4.7 points observed in the data.[28]

5.2 Lifetime Inequality: A Tale of Two Tails

The two broad statistics that we have focused on so far (the standard deviation of log and the IQR) measure inequality over the entire distribution, which can mask interesting patterns within different parts of the population. To delve a bit deeper, Figure 12a plots the 90th to 50th percentile ratio, or P90-P50 ratio, which measures inequality above the median. Figure 12b plots the P50-P10 ratio, which measures inequality below the median.

[27] Recall that our baseline sample only includes men and women who work at least 15 years during their lifetime, so the extensive margin of female employment has a more limited impact.

[28] Loosely speaking, changes in the gender gap in lifetime income stem from two sources: from changes in the gender gap in annual incomes and from changes in the number of years worked. Recall from Figure 2a that the average number of years worked was flat at 26 years (and slightly declining) for men and increasing from 22 to 24 years (or by 9%) for women. Consequently, the gap in lifetime income declined by more than its cross-sectional counterpart, which in turn mitigated the rise in lifetime inequality more so than what we see in the cross section. We return to this point in the Section 5.3.



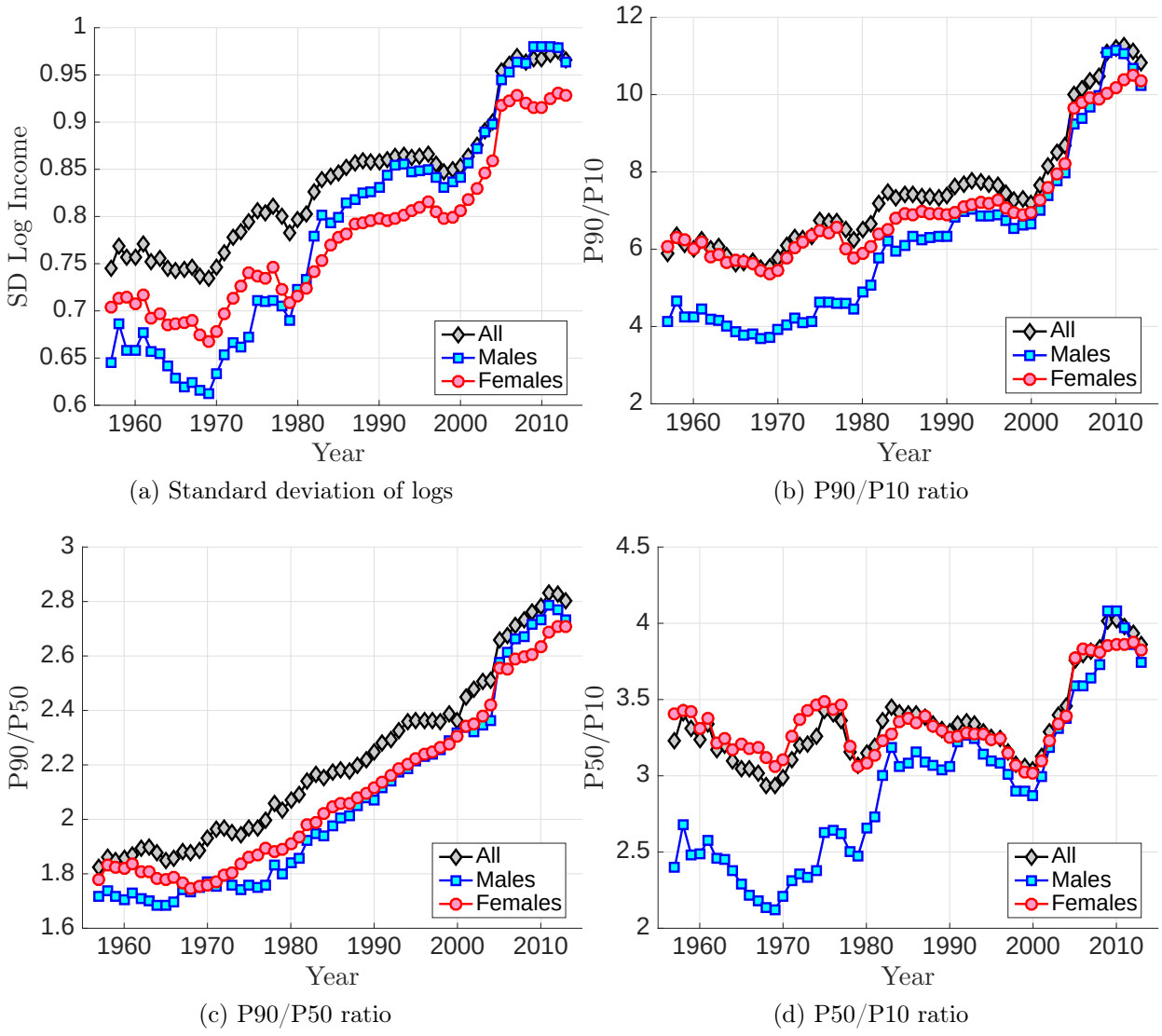
(a) P90/P50 ratio

(b) P50/P10 ratio

Figure 12: Lifetime Inequality by Cohort

Starting with the trends for the whole population (gray line with diamonds), the P90-P50 ratio of the lifetime income distribution increased throughout the period, rising from 2.3 for the 1957 cohort to 2.7 for the 1983 cohort. In contrast, the P50-P10 ratio fell throughout the period, from 3.1 to 2.9. Hence, the relatively stable overall inequality in the whole population we saw in Figure 11 resulted from falling inequality in the bottom half of the distribution offsetting rising inequality in the top half.

Turning to each gender group, the P90-P50 ratio was higher for women than for men in the early cohorts, but lifetime inequality rose more among men, so that by the 1983 cohort, the P90-P50 ratio was the same (around 2.5) for both genders. At the bottom end, the P50-P10 ratio *rose* for both genders (despite the *fall* in the same statistic for the combined population—the gray line) and did so by similar magnitudes, but arguably slightly more for women than for men (from 2.2 to 2.6 for women and from 2.6 to 2.9 for men). These last two results are yet another manifestation of the empirical finding from Figure 3: the gender gap in lifetime income closed most strongly below the median (of the combined population), which in turn kept the P50-P10 ratio from rising in the whole population despite the strong rise within each gender group. The gender gap closed to a smaller extent above the median, so the effect on the P90-P50 ratio of the whole population was smaller.



(a) Standard deviation of logs

(b) P90/P10 ratio

(c) P90/P50 ratio

(d) P50/P10 ratio

Figure 13: Cross-sectional Inequality by Cohort

5.3 Trends in Lifetime Inequality versus Cross-Sectional Inequality

Before concluding this discussion, we compare the statistics on lifetime inequality with cross-sectional inequality. This comparison also sheds further light on the closing gender gap and its effects on the lack of a rise in lifetime inequality in the whole population. To this end, Figure 13 plots the four measures of *cross-sectional* inequality analogous to those in Figure 11.

Two remarks are in order. First, notice that cross-sectional inequality in the whole

population rises strongly throughout this period, unlike the flat trend in lifetime inequality, which suggests that the closing of the gender gap in cross-sectional incomes has a smaller impact than its lifetime counterpart. Second, notice the remarkable convergence after 1990 of two of the inequality measures—P90-P10 ratio and P50-P10 ratio—between the male and female populations. Further, the P90-P50 ratio for men (which measures in inequality in the top half of the distribution) almost perfectly overlaps with the P90-P50 ratio for women, thought the entire sample period. The standard deviation of annual income is also similar for men and women, but has increased by about 10 log points more for men than for women. This larger increase for men could be due to the faster increase in the thickness of the right tail of the income distribution for men than for women.

To sum up our findings so far, the stability of lifetime inequality over this period is a powerful manifestation of the closing *lifetime* gender income gap, which is more clearly evident than is revealed by cross-sectional analysis. At the same time, all measures of lifetime inequality have been increasing within both gender groups. Some of these trends look quite different from their cross-sectional counterparts, which show rising overall inequality in the population.

5.4 Two Views of Increasing Lifetime Inequality

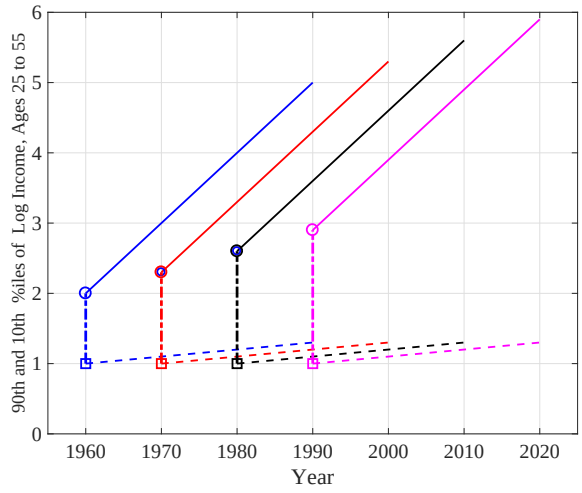
Why did lifetime inequality among men and among women increase across subsequent cohorts during this period? To shed light on this question, it is helpful to first examine the timing of the rise in within-cohort cross-sectional inequality over the life-cycle of a cohort. To illustrate some of the main ideas, consider the two possible scenarios shown in Figure 14.[29] In Figure 14a, starting with the 1960 cohort, we plot the 90th percentile (the solid, upwardly sloping blue line) and the 10th percentile (the dashed blue line, which the smaller slope) of the age-specific income distribution at every age as the cohort gets older. The P90-P10 ratio at age 25 is marked with a dashed line to highlight how much income inequality that cohort had when those workers entered the labor market.

The first scenario (illustrated in 14a) considers one possibility: each subsequent cohort enter the labor market with a higher initial inequality—shown with the larger P90-P10 ratio at age 25—but newer cohorts display the same rise in inequality over the life cycle as older cohorts, indicated by the fact that the P90 and P10 lines are parallel for every cohort. In this scenario, newer cohorts have higher lifetime inequality because they had

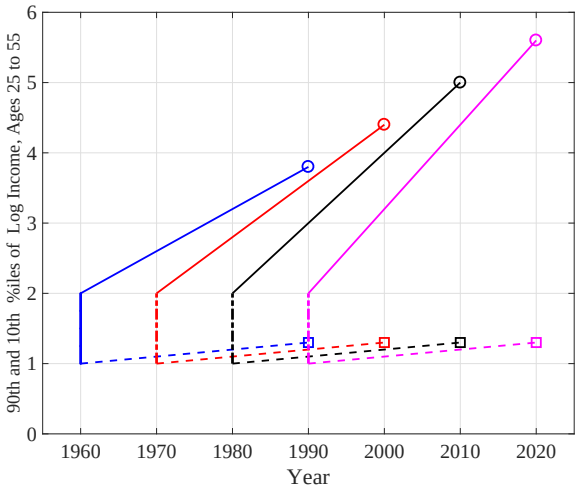
[29] Of course, these scenarios do not exhaust all the possible ways in which lifetime inequality can increase, but they do provide useful benchmarks and turn out to be the most relevant cases that we later document in the data.

Figure 14: Two Basic Ways Inequality Can Change from Cohort to Cohort

(a) New cohorts may be be entering with higher initial (age 25) income dispersion



(b) Newer cohorts may be experiencing faster rise in income dispersion with age



higher inequality at all ages, starting at age 25. The second scenario (illustrated in 14b) is that newer cohorts enter with the same initial inequality as older cohorts but display a faster rise in inequality with age, which in turn leads to higher level lifetime inequality.

These two scenarios can be examined through the lens of a simple stochastic process that underlies a lot of empirical work on income dynamics. Let the log income of individual i at age h, in year-of-birth cohort c be given by [30]

$$y_h^{i,c} = \alpha^{i,c} + z_h^{i,c}$$
$$z_h^{i,c} = z_{h-1}^{i,c} + \eta_h^{i,c},$$

where $\alpha^{i,c} \sim F(0, \sigma^2_{\alpha,c})$ is the individual-specific fixed effect, z_h is a random walk process with mean zero innovations $\eta^{i,c} \sim F(0, \sigma^2_{\eta,c})$, and $z_0^i \equiv 0$. Notice that the two variances are allowed to vary across cohorts but not with time (or age). Now define the lifetime average

[30] Year-of-birth cohort $c \equiv (t - 1957) - (h - 24)$. So the cohort that turned age 25 in year 1957 has $c = 1$ and each subsequent cohort is indexed sequentially. This process can be generalized by adding a purely transitory component or allowing for shocks that are less than permanent.

of log annual income[31] as

$$\overline{y}^{i,c} \equiv \frac{1}{31} \times \sum_{h=1}^{31} y_h^{i,c} = \alpha^{i,c} + \frac{1}{31} \times \sum_{h=1}^{31} \sum_{s=1}^{h} \eta_s^{i,c}.$$

With this income process, the variance of the lifetime average of log income is given by

$$\text{var}(\overline{y}^{i,c}) = \text{var}(\alpha^{i,c}) + \frac{1}{31^2} \times \sum_{h=1}^{31} \sum_{s=1}^{h} \text{var}\left(\eta_s^{i,c}\right) = \sigma_{\alpha,c}^2 + \frac{16}{31} \times \sigma_{\eta,c}^2. \tag{1}$$

This expression shows that in this simple framework, lifetime income inequality of a cohort is determined by the two components discussed in the scenarios of Figure 14: (i) initial inequality (at age 25) of the cohort, $\sigma_{\alpha,c}^2$, and (ii) the variance of income shocks, $\sigma_{\eta,c}^2$, which determines the rate at which inequality rises over the life-cycle of the cohort.

But how do we determine which one of these two components changed more from one cohort to the next and therefore contributed more to the rise in lifetime inequality in subsequent cohorts? To answer this question, notice that the same two variances in equation (1) also determine the *cross-sectional* variance of log income at different ages for a given cohort:

$$\text{var}(y_h^{i,c}) = \text{var}(\alpha^{i,c}) + \sum_{s=1}^{h} \text{var}(\eta_s^{i,c}) = \sigma_{\alpha,c}^2 + h \times \sigma_{\eta,c}^2. \tag{2}$$

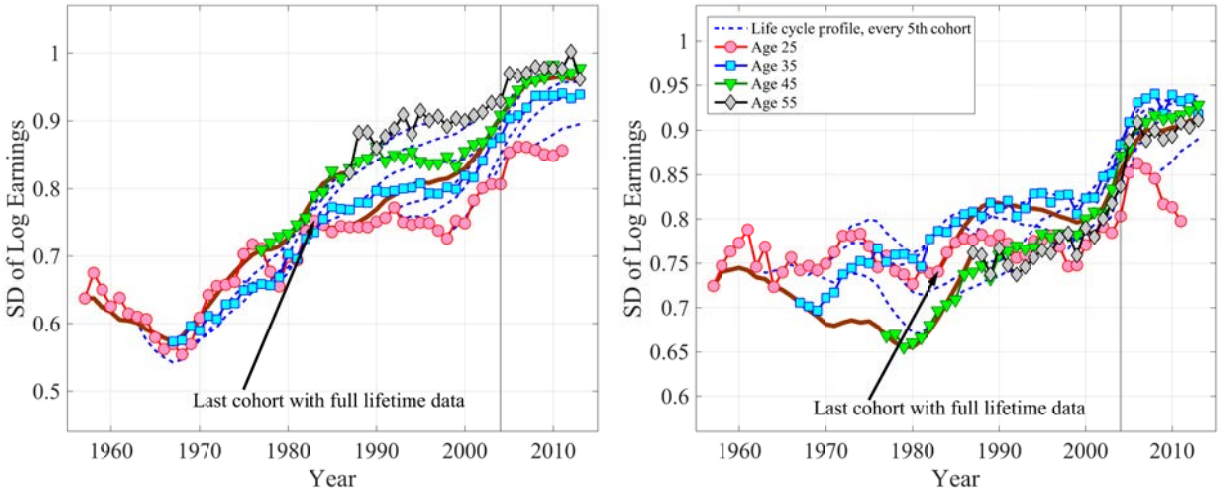
This relationship suggests that we can learn about the contribution of each component to rising lifetime inequality by analyzing the evolution of cross-sectional inequality *over the life cycle* of each of the 27 cohorts. This is what we do next.

5.5 Dissecting the Rise in Lifetime Inequality for Men

The top panels of Figure 15 plot the cross-sectional standard deviation of log income by age from the 1957 cohort to the 2013 cohort (for whom we only have data at age 25). The bottom panels plot the P90-P10 differential in log incomes.[32] Because plotting every data point would make the graph unreadable, the figure only shows values at ages 25 (red

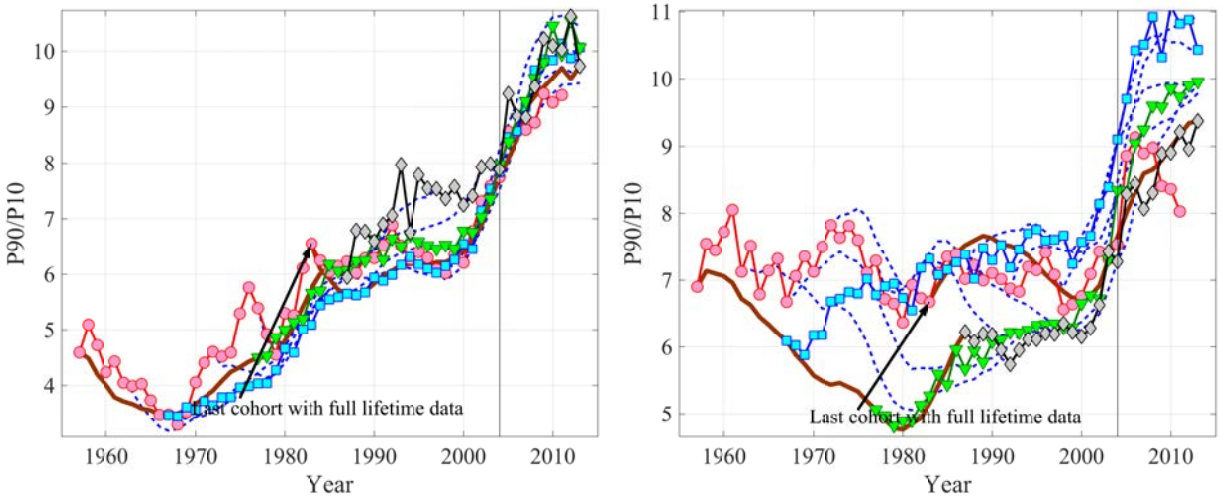
[31] This measure of lifetime income is related to the lifetime income measure we analyze in this paper but differs from it by a Jensen's inequality term. This measure is analytically more convenient for the purposes of this discussion.

[32] Although the simple additive decomposition applies only to the variance, percentile ratios have other advantages, such as allowing us to focus on different parts of the distribution and having interpretations that are easy to understand.



(a) Std Dev. of logs, Men

(b) Std Dev. of logs, Women



(c) P90-10 ratio, Men

(d) P90-10 ratio, Women

Figure 15: Age Profiles of Cross-Sectional Inequality, by Cohort

circles), 35 (blue squares), 45 (green triangles), and 55 (gray diamond) for each cohort. Cohorts that entered after 1983 have only partial life-cycle data, so not all data points are available for them. For every fifth cohort, the figure also plots the entire age profile.

Initial inequality for men (at age 25) has increased substantially – by about 30 log points – from a value of 0.55 for the 1968 cohort to 0.85 for the 2011 cohort. For comparison, recall from Figure 13a that the standard deviation of log income for men (of all ages) rose from 0.64 to 0.96 from the 1957 cross section to the 2011 cross section, for a total of 32 log points.

Viewed through the lens of the simple model of Section 5.4, the magnitude of the rise in $\sigma_{\alpha,c}$ appears very large.

Turning to inequality at age 35 (blue squares), we see that the graph overlaps almost perfectly with the initial inequality line (red circles) up to the 1983 cohort and then increases a bit faster, ending about 10 log points higher than age 25 inequality in 2011. Similarly, the age 45 and 55 inequality points are also aligned, a bit less precisely, with the previous values.

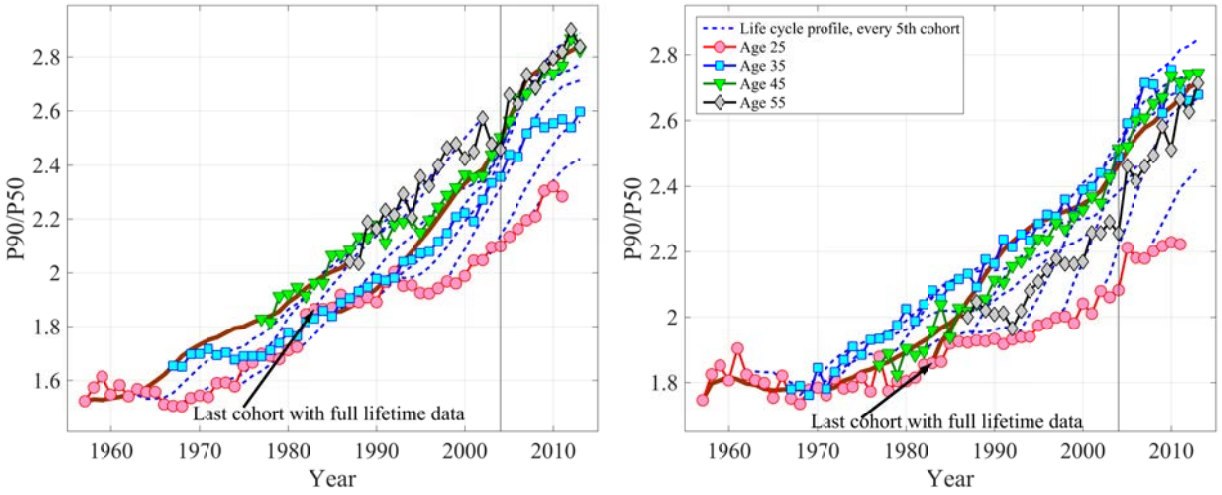
To understand what these patterns imply, observe that if the four lines that connected inequality points across cohorts (circles, squares, triangles, and diamonds) were parallel to each other throughout the period we analyze, this would imply that the rise in inequality *over the life* cycle did not change from cohort to cohort, that is, $\sigma^2_{\eta,c} \equiv \sigma^2_{\eta}$ for all c.[33] Consequently, equations (1) and (2) imply that the increases in both lifetime inequality across cohorts and cross-sectional inequality over time stem from the rise in initial dispersion, $\sigma_{\alpha,c}$ for newer cohorts. In other words, newer cohorts enter with much higher inequality than older cohorts, which is the main force behind rising income inequality.

Turning again to the top panels of Figure 15, we do not see a "full overlap" as we just described; there is certainly some steepening of the life-cycle profile, but it is somewhat modest. In the bottom panels, the P90–P10 ratio profiles reveal a similar pattern but do so even more strongly: now, all four lines align very closely, showing that the life-cycle profile of inequality has changed very little from cohort to cohort. In stark contrast, initial dispersion rose dramatically, from under about 3.3 for the 1968 cohort to over 9 for the 2011 cohort. This is a 2.7-fold rise in the P90-P10 ratio, which is similar to the total rise in the cross-sectional P90-P10 ratio for men, which rose from 4 to 10, a 2.5-fold rise.[34]

To summarize, in light of equations (1) and (2), the lifecycle profiles of inequality in Figure 15 suggest that the rise in initial inequality has been an important part of the rise in both lifetime and cross-sectional income inequality among men. To our knowledge, the fact that a substantial fraction of the rise in cross-sectional and lifetime inequality for men can be attributed to a rise in inequality at age 25 has not been emphasized in the previous work. We believe that this finding deserves more future work and a more central place in

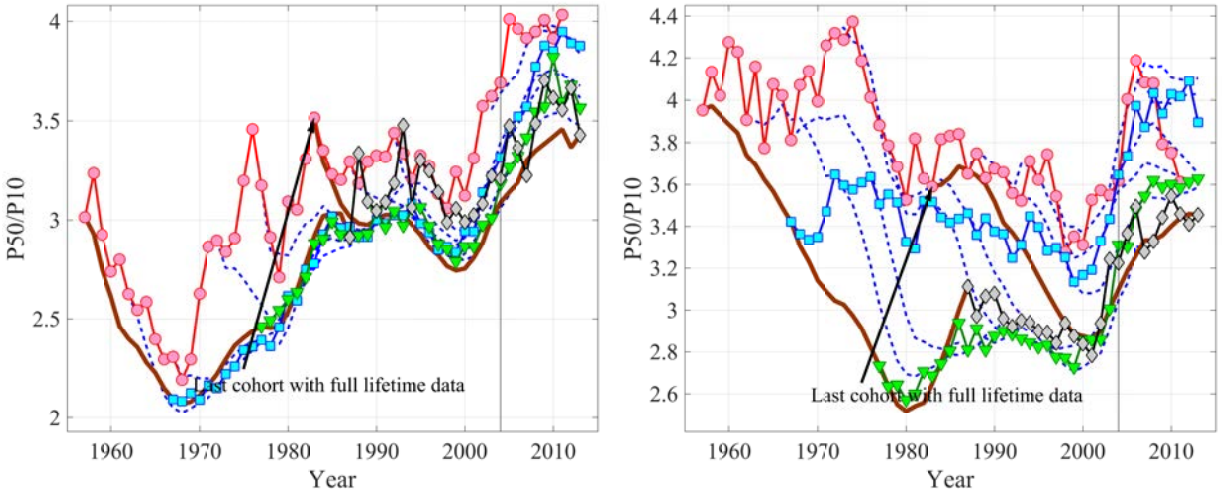
[33] We can further refine this statement and say that if two consecutive lines—say, ages 25 and 35 lines—were parallel, we could deduce that the innovation variances between ages 25 to 35 did not change over time.

[34] Clearly, the two numbers are not directly comparable as the cross-sectional dispersion is a mixture of 31 cohorts, so the P90-P10 ratio for all men in 2011 mixes up all cohorts from those who entered in 1981 to 2011.



(a) P90-50 ratio, Men

(b) P90-50 ratio, Women



(c) P50-10 ratio, Men

(d) P50-10 ratio, Women

Figure 16: Age Profiles of Inequality, by Cohort, Continued

discussions of rising inequality.

5.6 Dissecting the Rise in Lifetime Inequality for Women

Turning to women (the right panels of Figure 15), we see a very different pattern. Inequality at age 25 is completely flat from the 1957 cohort to the 2000 cohort, and then rises briefly and falls in the 2000s. Furthermore, for the early cohorts, inequality falls strongly with age for the first 20 years or so of the life-cycle, is U-shaped for middle cohorts

(falling for the first 10–15 years and then rising in the second half of the life-cycle), and only starts to rise after 2000 — and does so strongly for age groups 35 and older. Therefore, for women the main driver of rising lifetime inequality is not the rise in age 25 dispersion but a much more complex pattern of life-cycle inequality profiles, which twist and change shape for subsequent cohorts. These different drivers of rising inequality are surprising in light of Figure 12, which revealed very similar patterns (including magnitudes) of rising lifetime inequality for both genders.

To dig a bit further, in Figure 16, we plot measures of top- and bottom-end inequality (P90-P50 and P50-P10, respectively), which add up to the P90-P10 profile just analyzed. In the top panel, we see that the rise in inequality above the median, P90-P50, is actually quite similar for men and women. What is different are the changes in inequality below the median (P50-P10 ratio): the changes rise for men of all ages 35 and above, but they display a more complicated pattern— a shrinking P50-P10 ratio over the life cycle — for almost all cohorts.

These differences between men and women in their life-cycle profiles of inequality, as well as how the differences vary from cohort to cohort, deserve a fuller analysis that is beyond the scope of this paper. We leave these topics for future research.

6 Trends in the Share of the Pie

In this section, we offer an alternative perspective on trends in lifetime income inequality by examining how the aggregate lifetime income of each cohort—the pie, so to speak—is divided between males and females, and between individuals in different parts of the lifetime income distribution. So far, our analysis has documented very different trends in lifetime incomes for different groups in the population—men versus women, early versus late cohorts, low versus high earners. This section offers a way to quantify the differences in these trends by analyzing changes in how the lifetime income pie is shared across these groups.

6.1 Share of the Pie by Gender

We begin with a comparison between men and women and ask how much of the pie was earned by each gender group in each cohort. In Figure 17, each black square marker shows the share of the pie that accrued to the men in that cohort, and each red circle shows the same for women; so, the two lines always add up to 1 for each cohort. For the 1957 cohort, men collectively earned about 83.5% of the cohort's aggregate income, but this share has

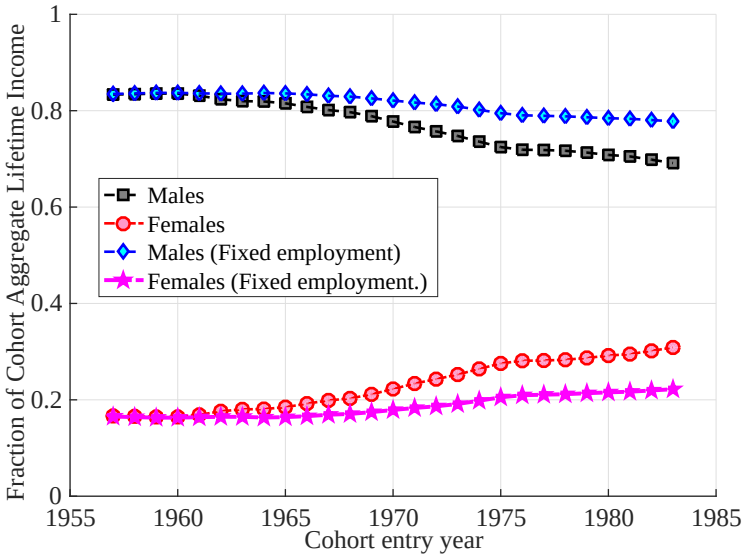


Figure 17: Share of Cohort Aggregate Income Going to Each Gender Group

declined monotonically, at first slowly and then more rapidly, so that by the 1983 cohort, men's share had fallen to 69.1%, for a total decline of 14.4% percentage points. Of course, the mirror image has been experienced by women, whose share has almost doubled across these same cohorts, from 16.5% to 30.9% of the 1983 cohort's aggregate income.

An important point to note is that this rising share for women (and decline for men) is due to the closing gender gap in: (i) annual income, (ii) the number of years worked (conditional on having worked at least 15 years), and (iii) the fraction of the population (women vs. men) that satisfies the baseline sample criteria, which depends on the rising attachment of women to the labor force relative to that of men (as well as changing population ratios, which is a smaller concern). To see how much each channel contributes to these shifting shares, we construct an alternative statistic that isolates the first trend by controlling for (ii) and (iii). We do this by fixing the lifetime employment share of each gender (aggregate lifetime years worked for all women as a fraction of cohort total) at its value for the first cohort (1957) and tracking the shares that would have resulted if women's years of work (above 15 years) relative to men remained the same over time. These adjusted shares are shown with blue diamond markers for men and magenta star markers for women.[35] As expected, the employment-adjusted share of cohort income accruing to men declines more

[35] An alternative approach is to limit attention to only males and females that worked for the entire 31 years of their lifetime. With this approach, the increase in the share of lifetime income for females is much more muted, only rising to about 22% by the 1984 cohort.

slowly than the unadjusted share (from 83.5% to 78%, compared with 83.5% to 69%). For women, the employment-adjusted share increases from 16.5% to 22.2% (compared with 16.5% to 30.5%). [36]

Thus, over the course of a generation (27 cohorts), the share of aggregate lifetime income accruing to women nearly doubled, and a large part of the increase is attributed to women becoming more strongly attached to the labor force.

6.2 Share of the Pie by Gender and Lifetime Income Percentiles

We now delve one level deeper and ask within each gender group, which lifetime income percentile group has seen its share of the pie rise or fall, and by how much? To answer this question, Figure 18 plots the share of each cohort's aggregate lifetime income accruing to men (black line with square markers) and women (red line with circles) in different parts of their gender-specific lifetime income distributions. For example, the 1957 point for men in the top left panel represents the fraction of the pie produced by the 1957 cohort that accrues to men in the 11th to 20th percentiles of the male lifetime income distribution in that cohort. The figures show both the raw shares and the employment-adjusted shares. We focus our discussion on the employment-adjusted shares, with the understanding that the raw income shares show even steeper declines for men and steeper increases for women.

One of the immediate findings revealed in this figure is the steadily declining fortunes (share of the pie) of the bottom 90% of men in each cohort. Even for men between the 91st and 95th percentiles, the share of the pie has been more or less flat. In fact, only men in the top 5% (of their lifetime income distribution) have seen a noticeable increase in their share of the pie, and this increase is really only significant for the top 1% of men: their share has almost doubled, from 4% to nearly 8% from the 1957 to 1983 cohorts. Women, on the other hand, have experienced an increase in their share of aggregate cohort income in all parts of the distribution. Noticeably, the shares accruing to women in the bottom percentiles of the lifetime income distribution have grown more slowly than the shares accruing to women in the top percentiles.[37]

[36] Because our selection criteria omits those who work less than 15 years, our measure of income shares misses income accruing to those that work few hours. For example, if there was an increase in the average number of years worked by females who only worked for between 1 and 10 years, this should result in an increase in the income share accruing to women. Given our sample selection, this would be missed. Figure C.2 in Appendix C shows a version of Figure 17 in which income shares are calculated without imposing any minimum income or years worked selection criterion. The results are similar to those in Figure 17.

[37] Figure C.3 in Appendix C is a version of Figure 18 in which income shares are calculated without imposing any minimum income or years worked selection criterion. The results are similar to those in Figure 18.

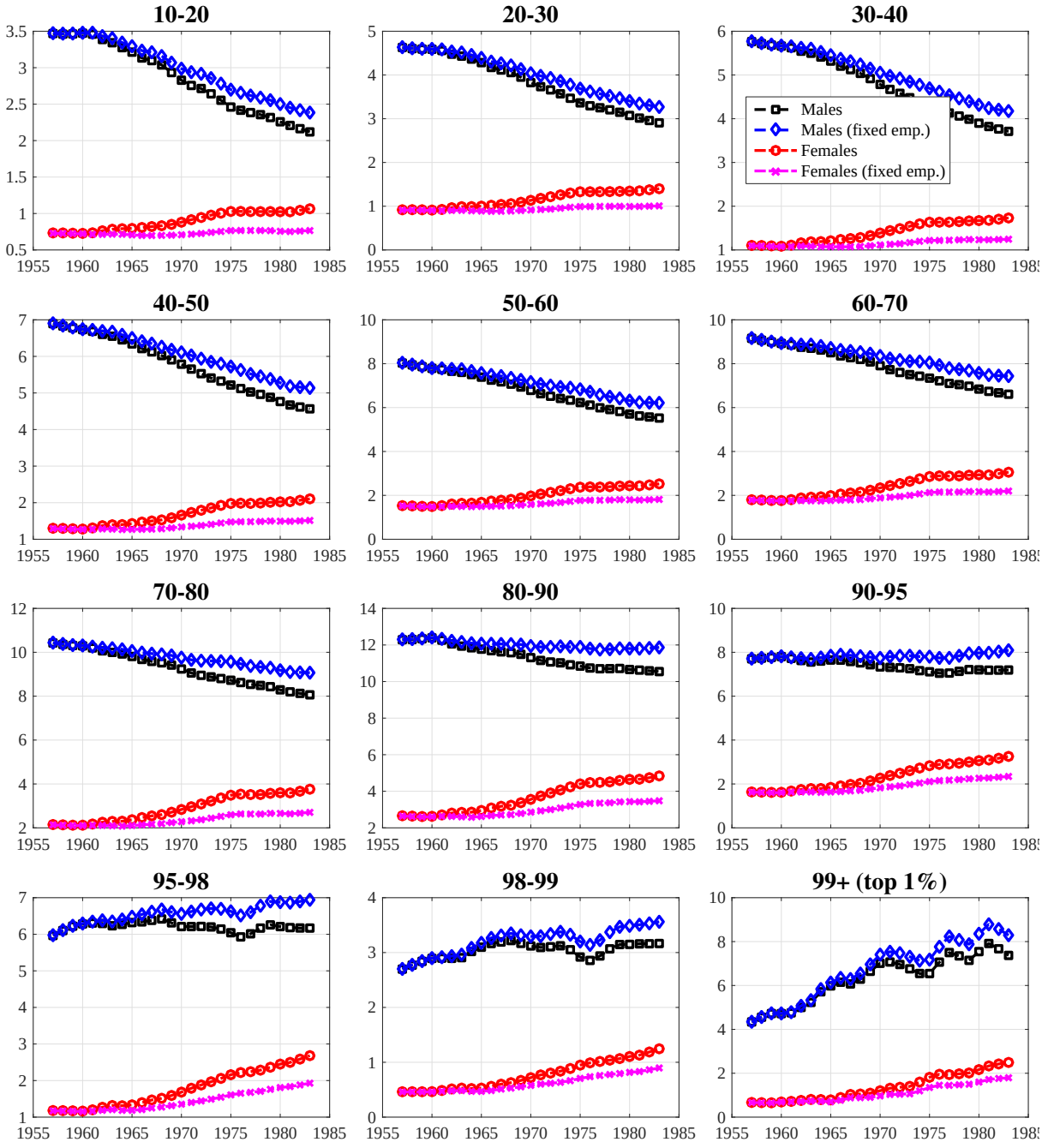


Figure 18: Share of Cohort Lifetime Income Going to Each Gender / Percentile Groups (indicated by the lower and upper end of percentile thresholds)

7 Conclusions

In this paper, we have studied how the distribution of lifetime income has evolved in the United States over six decades: 1957 to 2013. This analysis reached two broad conclusions. First, we found stagnation of lifetime incomes for men and growing lifetime income for women. From the cohort that entered the labor market in 1967 to the cohort that entered in 1983, median lifetime income of men declined by 10%–19%, and median lifetime income of women increased by 22%–33%. We find little-to-no rise in the lower three-quarters of the percentiles of the male lifetime income distribution during this period. Because the lifetime income gains for women were relative to very low lifetime income for the earliest cohort, the closing of the lifetime gender gap was not enough to offset the stagnation of lifetime incomes of men. Accounting for rising employer-provided health and retirement benefits partly mitigates these findings but does not overturn them. Much of these changes across cohorts come from the substantial changes in income at age 25, particularly for men. In light of this finding, and based on partial life-cycle income observed for cohorts that are currently in the labor market, the stagnation of median lifetime income seems likely to continue.

Second, we found that inequality in lifetime incomes increased significantly within each gender group, but the closing lifetime gender gap has kept overall lifetime inequality virtually flat. A major source of the increase in lifetime inequality within gender groups is attributed to newer cohorts entering the labor market with larger initial dispersion in incomes, and based on partial life-cycle income data for very recent cohorts (those that turned age 25 in the 2000s), the increase in inequality is also likely to continue.

Overall, our findings suggest that both the stagnation of median lifetime income for men, and the increase in lifetime income inequality for men and women, can be traced to changes that newer cohorts have experienced before age 25. Once in the labor market, the income distribution for these newer cohorts has evolved similarly to how the distribution evolved for older cohorts. This finding is especially true for men, which is interesting, given that income inequality among males has been extensively studied, yet this finding does not seem to have been previously emphasized. Our findings thus suggest that in order to understand why the U.S. income distribution has changed dramatically over the past 50 years, we need to better understand the experiences of newer cohorts during their youth (and possibly earlier), and how those experiences differ from those of older cohorts.

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A Additional Tables and Figures for Sections 3

Table A.1: Distribution of Lifetime Incomes by Cohort for Males ($ '000)

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	42.21	37.71	10.58	14.50	23.50	52.79	56.90	70.06	88.28	156.75
1958	43.40	38.71	10.84	14.81	23.90	53.46	57.39	71.67	89.20	164.79
1959	43.86	38.07	10.65	14.64	23.74	53.83	58.16	74.29	94.19	179.16
1960	44.96	39.17	11.04	15.52	25.11	55.21	60.44	75.74	93.89	179.76
1961	45.33	39.17	11.64	15.56	24.59	55.66	60.13	75.74	96.94	184.10
1962	46.03	40.02	12.10	16.10	25.15	55.91	60.33	76.04	98.91	182.93
1963	47.41	40.74	11.66	15.68	25.62	57.79	62.49	78.35	100.36	196.22
1964	47.18	40.65	11.74	16.15	25.34	57.57	61.75	76.96	101.00	197.83
1965	49.22	40.53	11.32	15.57	25.65	58.54	63.46	80.85	108.00	230.73
1966	48.98	41.25	11.46	15.77	25.46	58.96	63.85	81.85	107.79	220.73
1967	51.47	42.34	12.08	16.16	26.07	61.15	66.71	86.00	113.65	246.98
1968	50.94	41.80	11.91	16.01	26.35	60.80	65.81	84.99	113.99	236.71
1969	51.08	41.19	11.53	15.48	25.41	61.08	66.45	85.52	112.13	249.65
1970	51.44	41.26	11.00	15.02	25.12	60.71	66.50	86.26	112.33	263.86
1971	52.27	42.15	11.48	15.69	25.68	61.46	67.13	86.81	116.77	260.52
1972	52.40	41.21	10.71	15.03	25.12	61.68	67.74	89.80	119.42	261.78
1973	51.50	40.79	11.00	14.95	24.78	60.99	67.08	87.03	116.46	270.30
1974	50.59	39.92	10.61	14.00	23.84	60.36	66.67	86.88	116.32	257.37
1975	50.22	39.81	10.17	13.65	23.14	60.42	66.30	86.76	115.90	238.90
1976	50.85	39.53	10.34	13.84	23.14	61.24	68.03	88.48	115.76	234.39
1977	51.85	39.49	10.42	14.02	23.32	60.52	66.86	88.49	118.50	249.74
1978	51.90	38.82	10.00	13.52	22.95	61.29	68.25	90.09	122.82	264.46
1979	51.56	39.01	9.89	13.74	22.85	61.33	67.88	91.01	124.27	271.17
1980	52.82	38.73	9.93	13.52	22.86	61.46	68.44	93.09	126.77	281.16
1981	53.17	38.36	9.70	13.33	22.50	61.16	68.77	94.24	127.75	294.04
1982	52.78	38.49	9.92	13.39	22.46	61.35	69.04	94.50	127.84	293.90
1983	52.22	37.96	9.62	12.96	21.96	60.33	68.24	94.58	128.68	290.16

Table A.2: Distribution of Lifetime Incomes by Cohort for Females ($ '000)

	Averages			Selected Percentiles							
Cohort	Mean	Median		p5	p10	p25	p75	p80	p90	p95	p99
1957	16.71	14.09	0.37	5.00	6.38	9.20	21.58	23.66	30.25	35.88	50.44
1958	16.93	14.39	0.37	5.28	6.42	9.44	21.73	24.12	30.82	37.18	51.00
1959	17.09	14.60	0.38	5.43	6.68	9.71	21.71	24.27	30.28	36.32	50.33
1960	17.33	14.36	0.37	5.25	6.54	9.54	22.57	24.82	31.86	38.02	51.65
1961	17.81	14.95	0.38	5.63	6.68	9.76	22.58	25.39	32.50	38.11	56.21
1962	18.22	15.36	0.38	5.36	6.68	10.03	23.32	25.75	33.06	40.55	57.57
1963	18.60	15.53	0.38	5.52	6.97	10.20	23.51	25.97	33.19	40.76	59.09
1964	18.56	15.31	0.38	5.75	7.08	10.27	23.32	25.87	33.64	41.67	59.41
1965	18.74	16.06	0.40	5.64	7.04	10.20	24.18	26.59	34.12	41.02	55.31
1966	19.88	16.50	0.40	5.57	7.00	10.49	25.67	28.45	36.46	43.96	62.80
1967	20.62	16.84	0.40	5.97	7.44	10.80	26.09	29.12	37.17	45.32	69.18
1968	21.09	17.32	0.41	5.82	7.24	10.93	27.10	29.97	38.29	47.43	73.96
1969	21.23	17.46	0.42	5.93	7.49	11.17	27.33	30.32	38.41	47.90	73.46
1970	22.52	18.20	0.44	5.96	7.50	11.36	28.45	31.94	41.94	51.52	83.66
1971	23.46	19.05	0.45	6.20	7.76	11.99	29.63	32.83	43.43	53.24	86.45
1972	23.70	19.03	0.46	6.31	7.91	11.92	29.97	33.74	43.44	54.29	90.08
1973	24.33	19.49	0.48	6.19	7.82	11.99	31.03	34.77	45.46	56.68	88.54
1974	24.87	19.94	0.50	6.38	8.16	12.57	31.64	35.27	46.29	57.93	96.75
1975	25.95	20.25	0.51	6.16	8.02	12.33	32.56	36.35	47.72	59.96	101.07
1976	27.15	21.11	0.53	6.59	8.52	13.00	34.63	38.25	50.39	63.63	112.28
1977	27.11	20.88	0.53	6.54	8.33	12.89	33.86	38.06	50.36	64.16	118.53
1978	27.59	21.43	0.55	6.47	8.47	13.05	34.11	38.59	51.49	64.94	121.29
1979	28.14	21.70	0.56	6.49	8.49	13.10	34.89	39.37	52.43	67.62	119.76
1980	28.76	21.91	0.57	6.55	8.47	13.22	35.81	40.24	53.80	69.32	124.78
1981	29.35	22.05	0.57	6.69	8.63	13.53	35.14	39.65	54.54	71.39	134.93
1982	29.27	22.05	0.57	6.57	8.56	13.48	35.54	39.92	53.64	71.55	128.08
1983	29.85	22.35	0.59	6.69	8.66	13.50	36.31	40.87	55.40	74.02	143.61

Table A.3: Distribution of Lifetime Incomes by Cohort for Males ($ '000), Deflated with CPI

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	51.38	46.08	12.99	17.91	28.83	64.24	69.06	85.16	106.94	188.93
1958	52.59	47.17	13.45	18.16	29.26	64.91	69.55	86.85	108.00	193.95
1959	52.92	46.12	13.05	17.93	28.97	65.02	70.25	89.40	112.81	210.88
1960	54.00	47.34	13.46	18.89	30.55	66.32	72.61	90.66	112.28	209.89
1961	54.20	47.13	14.13	18.88	29.76	66.61	71.93	90.47	115.07	218.15
1962	54.77	47.87	14.63	19.51	30.46	66.56	72.06	90.23	117.24	214.62
1963	56.10	48.50	14.09	18.84	30.79	68.43	73.85	92.58	117.65	226.43
1964	55.59	48.17	14.09	19.39	30.31	67.89	72.63	90.32	117.45	228.05
1965	57.60	47.87	13.65	18.44	30.44	68.52	74.28	94.40	124.70	266.21
1966	57.04	48.38	13.66	18.71	30.20	68.66	74.41	95.34	124.42	254.00
1967	59.54	49.40	14.25	19.04	30.56	70.83	77.21	99.56	130.00	281.47
1968	58.61	48.39	13.96	18.74	30.71	70.09	75.85	97.51	129.43	267.51
1969	58.36	47.46	13.34	17.96	29.59	69.91	75.94	97.37	127.17	278.48
1970	58.36	47.31	12.64	17.30	28.89	69.12	75.56	97.79	126.26	292.87
1971	58.94	47.89	13.14	17.98	29.33	69.52	75.72	97.67	130.59	290.96
1972	58.70	46.64	12.32	17.10	28.51	69.29	76.07	100.56	132.58	287.89
1973	57.35	45.81	12.44	16.95	27.82	68.17	74.83	96.66	128.30	300.02
1974	56.02	44.53	11.86	15.73	26.72	66.93	73.95	95.98	128.11	279.78
1975	55.26	44.06	11.33	15.18	25.79	66.65	73.14	95.31	126.76	256.09
1976	55.60	43.52	11.42	15.41	25.67	67.19	74.32	96.37	126.10	251.53
1977	56.30	43.25	11.55	15.38	25.56	65.91	72.73	95.88	128.51	265.19
1978	56.06	42.24	10.90	14.74	25.12	66.43	73.75	96.81	131.78	279.78
1979	55.40	42.19	10.76	14.89	24.76	66.22	73.07	97.89	132.50	285.64
1980	56.44	41.68	10.67	14.65	24.71	65.85	73.31	99.33	134.63	294.02
1981	56.52	41.05	10.52	14.32	24.10	65.16	73.29	100.20	135.31	307.08
1982	55.85	41.03	10.65	14.40	23.92	65.26	73.26	99.79	134.61	305.62
1983	55.05	40.25	10.34	13.92	23.35	63.86	72.10	99.62	134.64	301.15

Table A.4: Distribution of Lifetime Incomes by Cohort for Females ($ '000), Deflated with CPI

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	20.20	16.96	6.12	7.71	11.08	26.12	28.63	36.59	43.40	60.53
1958	20.38	17.23	6.36	7.71	11.29	26.22	29.08	37.09	44.61	61.84
1959	20.48	17.51	6.55	7.99	11.62	25.92	29.01	36.22	43.61	61.22
1960	20.66	17.08	6.25	7.85	11.37	26.96	29.60	38.01	45.65	61.67
1961	21.12	17.68	6.68	7.98	11.60	26.84	30.17	38.74	45.39	66.09
1962	21.49	18.04	6.36	7.90	11.80	27.50	30.36	39.09	47.69	67.06
1963	21.82	18.29	6.51	8.20	11.91	27.59	30.27	39.03	47.88	69.36
1964	21.66	17.81	6.77	8.27	12.01	27.15	30.27	39.26	48.40	69.15
1965	21.78	18.66	6.54	8.17	11.90	28.03	30.95	39.68	47.72	64.31
1966	22.97	19.09	6.45	8.13	12.17	29.67	32.88	42.22	51.12	72.94
1967	23.71	19.37	6.91	8.56	12.39	30.04	33.48	42.80	52.15	79.82
1968	24.09	19.74	6.68	8.32	12.54	30.85	34.15	43.90	53.90	84.25
1969	24.13	19.85	6.73	8.56	12.67	31.09	34.35	43.77	54.43	82.68
1970	25.43	20.53	6.81	8.53	12.87	32.14	36.03	47.28	57.91	93.47
1971	26.34	21.45	7.03	8.75	13.44	33.33	36.87	48.94	59.93	96.72
1972	26.47	21.24	7.09	8.85	13.41	33.47	37.60	48.46	60.73	98.53
1973	27.01	21.72	6.92	8.72	13.31	34.51	38.70	50.57	62.68	97.25
1974	27.47	22.06	7.04	9.03	13.91	35.03	39.08	50.99	63.67	105.71
1975	28.48	22.28	6.82	8.83	13.58	35.82	39.96	52.33	65.79	109.32
1976	29.63	23.12	7.23	9.29	14.24	37.74	41.80	55.26	69.30	121.97
1977	29.43	22.76	7.12	9.10	14.03	36.81	41.43	54.54	69.56	128.16
1978	29.77	23.22	7.05	9.17	14.13	36.81	41.72	55.63	69.75	128.39
1979	30.21	23.38	7.06	9.22	14.12	37.63	42.27	56.35	72.24	127.22
1980	30.73	23.47	7.09	9.09	14.23	38.30	43.17	57.54	74.02	131.99
1981	31.19	23.50	7.22	9.23	14.43	37.42	42.08	57.95	75.58	144.23
1982	30.97	23.39	7.01	9.13	14.35	37.55	42.34	56.89	75.70	133.99
1983	31.49	23.63	7.07	9.16	14.32	38.39	43.12	58.47	77.60	150.17

Table A.5: Growth Rates of Cohort Lifetime Income, Intensive Margin

Cohorts		Averages		Selected Percentiles							
		Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
Males – PCE											
57–68	Cumulative	21.46	12.80	11.59	9.70	9.31	16.89	17.97	24.35	32.86	55.20
	Annualized	1.78	1.10	1.00	0.85	0.81	1.43	1.51	2.00	2.62	4.08
68–83	Cumulative	3.61	–7.16	–17.37	–16.84	–14.07	3.42	7.20	11.54	12.91	17.41
	Annualized	0.24	–0.49	–1.26	–1.22	–1.01	0.22	0.46	0.73	0.81	1.08
57–83	Cumulative	25.84	4.73	–7.79	–8.77	–6.07	20.89	26.47	38.71	50.00	82.23
	Annualized	0.89	0.18	–0.31	–0.35	–0.24	0.73	0.91	1.27	1.57	2.33
Males – CPI											
57–68	Cumulative	14.83	7.12	6.12	3.76	3.66	10.88	11.62	17.25	25.27	43.18
	Annualized	1.26	0.63	0.54	0.34	0.33	0.94	1.00	1.46	2.07	3.32
68–83	Cumulative	–5.11	–15.13	–24.60	–24.32	–21.35	–5.55	–1.95	2.22	3.58	8.12
	Annualized	–0.35	–1.09	–1.86	–1.84	–1.59	–0.38	–0.13	0.15	0.23	0.52
57–83	Cumulative	8.96	–9.08	–19.98	–21.48	–18.48	4.73	9.45	19.85	29.75	54.80
	Annualized	0.33	–0.37	–0.85	–0.93	–0.78	0.18	0.35	0.70	1.01	1.69
Females – PCE											
57–68	Cumulative	24.02	18.02	11.43	11.26	14.80	23.11	24.28	27.76	37.48	35.51
	Annualized	1.98	1.52	0.99	0.97	1.26	1.91	2.00	2.25	2.94	2.80
68–83	Cumulative	33.56	19.97	12.29	12.54	16.70	28.34	32.21	44.40	51.60	92.81
	Annualized	1.95	1.22	0.78	0.79	1.03	1.68	1.88	2.48	2.81	4.47
57–83	Cumulative	65.63	41.58	25.12	25.22	33.97	57.99	64.31	84.49	108.42	161.27
	Annualized	1.96	1.35	0.87	0.87	1.13	1.77	1.93	2.38	2.86	3.76
Females – CPI											
57–68	Cumulative	17.16	11.78	5.13	4.83	8.40	16.71	17.63	20.97	29.35	30.03
	Annualized	1.45	1.02	0.46	0.43	0.74	1.41	1.49	1.75	2.37	2.42
68–83	Cumulative	23.45	10.92	3.61	4.28	8.05	18.61	21.95	32.96	40.26	73.75
	Annualized	1.41	0.69	0.24	0.28	0.52	1.14	1.33	1.92	2.28	3.75
57–83	Cumulative	44.64	23.98	8.92	9.32	17.13	38.43	43.45	60.85	81.42	125.91
	Annualized	1.43	0.83	0.33	0.34	0.61	1.26	1.40	1.84	2.32	3.18

Table A.6: Distribution of Lifetime Incomes by Cohort, Adjusted for Years Worked ($ '000)

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	39.87	34.19	11.37	14.24	21.50	49.76	53.66	66.78	83.64	157.19
1958	40.59	34.38	11.41	14.50	21.50	50.60	54.67	66.68	84.05	164.34
1959	41.04	34.33	11.77	14.56	21.56	50.22	54.66	68.85	88.17	175.91
1960	42.22	35.74	11.83	14.68	22.25	51.89	56.47	71.27	89.72	176.38
1961	42.59	35.41	12.04	14.92	22.31	52.18	56.94	71.72	92.51	176.71
1962	43.01	35.80	12.23	15.25	22.82	52.78	56.99	71.89	90.64	180.17
1963	43.88	35.95	12.23	15.34	22.41	53.54	58.36	73.58	94.25	186.19
1964	44.06	36.09	12.27	15.25	22.88	53.94	58.50	73.26	93.42	196.08
1965	45.42	36.15	12.17	15.10	22.86	54.23	59.27	75.38	100.19	216.48
1966	45.27	36.50	12.08	15.22	22.86	54.65	59.54	75.85	98.70	210.42
1967	47.28	37.32	12.60	15.63	23.27	56.36	61.63	79.16	104.84	243.38
1968	47.18	37.62	12.42	15.67	23.67	56.40	62.03	79.81	104.46	228.76
1969	47.04	36.92	12.45	15.72	23.39	55.98	61.62	79.68	102.62	231.33
1970	47.77	37.09	12.42	15.66	23.29	56.59	62.02	80.64	106.14	236.64
1971	48.41	37.69	12.76	16.11	24.03	56.96	62.39	81.01	107.08	227.62
1972	48.43	37.26	12.62	15.85	23.69	56.82	62.61	81.60	110.17	244.52
1973	48.24	37.32	12.69	15.97	23.75	56.43	62.54	81.57	107.86	245.61
1974	47.63	37.01	12.90	16.03	23.74	55.73	61.62	81.31	107.09	231.55
1975	47.89	36.75	12.53	15.79	23.47	56.64	62.43	81.12	107.63	227.84
1976	48.42	37.30	12.85	16.21	23.91	57.06	63.09	83.32	109.81	225.08
1977	48.93	37.06	12.84	16.14	23.91	57.11	63.47	83.39	110.39	238.23
1978	49.51	37.25	12.86	16.01	23.97	57.16	63.57	84.51	113.67	255.77
1979	49.55	37.25	12.97	16.15	24.01	57.59	64.18	85.86	114.91	258.92
1980	50.56	37.38	12.65	15.94	23.96	57.79	64.74	87.64	117.13	256.90
1981	51.06	37.10	12.78	16.06	23.88	57.79	64.63	88.57	119.07	266.42
1982	50.68	37.18	12.86	16.10	23.80	57.84	64.89	88.14	118.52	274.71
1983	50.48	36.70	12.66	15.97	23.49	57.72	64.64	89.33	120.49	264.22

Table A.7: Distribution of Lifetime Incomes by Cohort ($ '000)

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	33.70	27.34	6.77	8.89	14.97	45.14	49.82	62.65	78.26	135.71
1958	34.40	27.68	6.86	9.04	15.12	46.46	50.59	62.48	78.39	137.50
1959	34.80	27.52	6.99	9.33	15.22	45.61	50.35	64.40	82.14	149.87
1960	35.83	28.93	6.99	9.35	15.57	47.10	51.93	66.78	83.40	152.91
1961	35.89	28.47	7.25	9.48	15.67	46.91	52.02	66.48	84.00	160.22
1962	36.28	28.96	7.16	9.67	16.08	47.43	52.29	67.01	83.68	158.54
1963	36.95	28.76	7.40	9.65	15.81	48.50	53.25	67.73	86.13	162.67
1964	36.88	28.76	7.41	9.82	15.88	48.59	53.45	67.49	85.10	164.11
1965	38.10	29.16	7.38	9.61	16.01	48.27	53.59	69.22	90.73	188.18
1966	37.97	29.47	7.34	9.73	16.11	48.95	54.06	69.60	90.03	179.25
1967	39.73	29.80	7.69	9.94	16.50	50.36	55.93	72.66	94.95	206.15
1968	39.62	30.32	7.46	10.07	16.72	50.26	55.66	72.52	93.94	196.80
1969	39.42	29.57	7.58	9.97	16.48	49.91	55.55	72.66	92.36	194.33
1970	39.97	29.77	7.48	9.85	16.53	50.14	55.80	73.36	94.40	193.71
1971	40.58	30.29	7.74	10.31	17.13	50.30	56.02	73.63	95.18	198.50
1972	40.46	29.83	7.70	10.19	16.75	49.97	55.90	74.30	99.00	207.48
1973	40.25	30.09	7.72	10.25	17.06	49.68	55.60	73.68	95.10	199.67
1974	39.71	29.39	7.83	10.40	16.83	49.24	54.85	73.48	95.22	193.76
1975	39.90	29.72	7.57	10.05	16.60	49.62	55.72	73.03	95.58	192.54
1976	40.68	30.39	7.89	10.51	17.03	50.19	56.18	75.68	98.24	192.24
1977	40.96	30.15	7.86	10.45	16.98	49.88	56.09	74.67	97.45	204.65
1978	41.50	30.09	7.81	10.37	17.22	50.33	56.72	76.59	101.32	216.74
1979	41.54	30.18	7.91	10.44	17.24	50.45	56.71	77.29	102.85	222.90
1980	42.50	30.37	7.71	10.31	17.28	50.76	57.04	78.56	105.67	226.71
1981	42.80	29.93	7.85	10.34	17.11	50.53	56.87	80.17	106.64	226.90
1982	42.58	29.88	7.82	10.45	17.28	50.40	56.74	79.24	106.48	234.37
1983	42.33	29.84	7.85	10.31	16.84	50.00	56.66	79.87	108.29	228.15

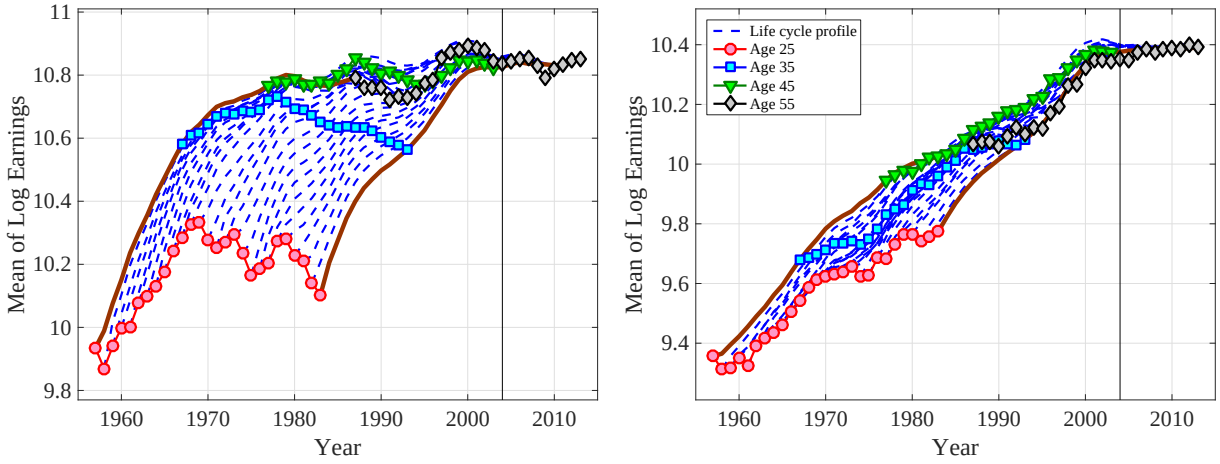
Table A.8: Distribution of Lifetime Incomes by cohort ($ '000), Deflated with CPI

	Averages		Selected Percentiles							
Cohort	Mean	Median	p5	p10	p25	p75	p80	p90	p95	p99
1957	40.98	33.49	8.25	10.81	18.29	55.08	60.74	76.20	94.67	163.50
1958	41.64	33.70	8.34	10.99	18.35	56.24	61.50	75.66	94.80	164.15
1959	41.95	33.29	8.51	11.25	18.42	55.20	60.88	77.49	98.39	178.19
1960	42.99	34.94	8.43	11.13	18.76	56.56	62.37	80.06	99.77	182.27
1961	42.84	34.13	8.67	11.34	18.77	56.27	62.26	79.13	100.20	187.86
1962	43.11	34.53	8.47	11.46	19.18	56.59	62.32	79.39	98.83	184.54
1963	43.65	34.26	8.77	11.38	18.74	57.47	63.02	80.08	101.10	190.47
1964	43.38	34.09	8.70	11.60	18.75	57.32	63.09	79.33	99.90	191.10
1965	44.53	34.35	8.64	11.30	18.84	56.74	62.94	81.10	105.50	214.90
1966	44.15	34.50	8.60	11.35	18.90	57.19	63.18	80.80	104.06	203.75
1967	45.91	34.74	8.95	11.48	19.15	58.57	64.85	84.12	109.37	236.24
1968	45.52	35.11	8.64	11.61	19.31	58.05	64.37	83.22	107.05	221.26
1969	44.99	34.00	8.68	11.45	18.92	57.28	63.76	82.90	104.72	217.94
1970	45.30	33.84	8.53	11.27	18.84	57.15	63.47	83.21	106.74	215.71
1971	45.71	34.30	8.75	11.65	19.43	56.93	63.45	83.07	106.67	222.02
1972	45.29	33.59	8.61	11.47	18.86	56.14	62.81	83.17	110.08	229.35
1973	44.79	33.73	8.59	11.50	19.04	55.68	62.09	82.05	105.52	216.37
1974	43.94	32.75	8.68	11.53	18.70	54.66	60.94	81.17	105.02	211.29
1975	43.87	32.85	8.36	11.10	18.37	54.77	61.33	80.28	104.78	209.50
1976	44.46	33.34	8.70	11.56	18.73	55.07	61.65	82.64	106.85	207.69
1977	44.49	32.93	8.60	11.47	18.54	54.42	61.11	81.20	105.32	219.64
1978	44.81	32.72	8.50	11.28	18.69	54.62	61.40	82.73	109.20	231.77
1979	44.63	32.53	8.54	11.30	18.63	54.46	61.17	82.99	110.37	237.47
1980	45.41	32.67	8.34	11.10	18.60	54.44	61.07	83.89	112.74	239.34
1981	45.50	31.99	8.40	11.10	18.31	53.91	60.68	85.26	112.85	239.38
1982	45.06	31.74	8.34	11.18	18.42	53.50	60.32	83.91	112.72	245.03
1983	44.63	31.63	8.37	11.00	17.93	52.82	59.81	84.19	113.69	237.59

Table B.1: Cumulative percent change in age specific median income, by cohort

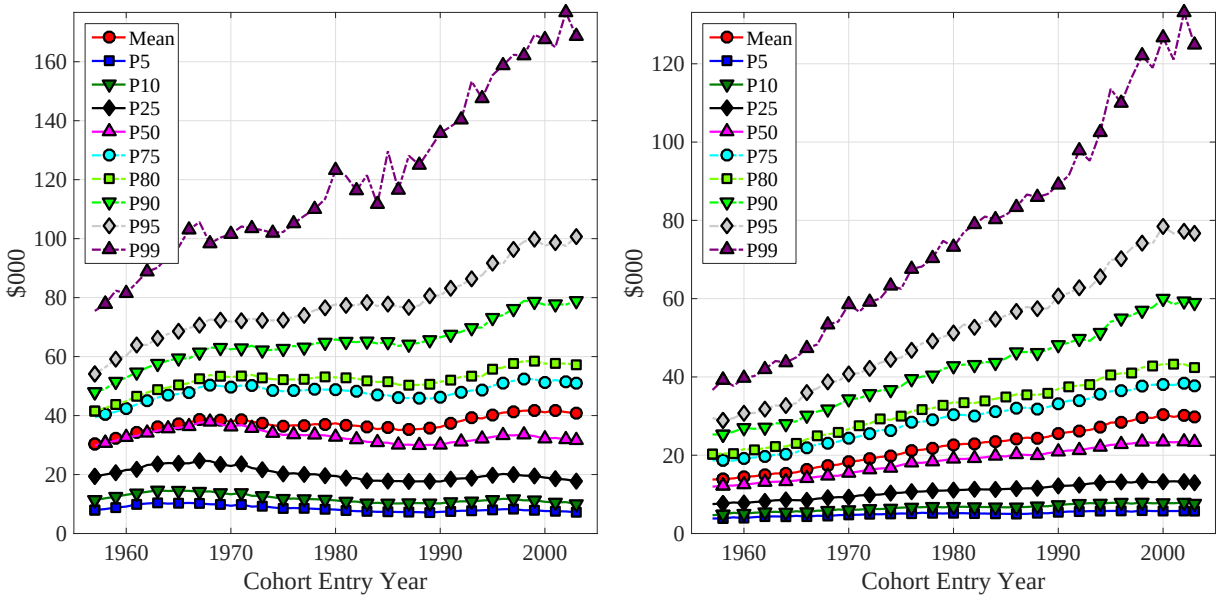
	Male			Female			All		
	25-35	35-45	45-55	25-35	35-45	45-55	25-35	35-45	45-55
1957	71.37	23.65	3.13	28.27	24.82	15.06	63.10	14.15	3.51
1958	86.26	22.65	0.61	45.20	21.65	12.48	77.03	13.34	0.80
1959	84.35	17.13	-3.37	42.68	24.42	8.80	71.41	9.10	-0.79
1960	71.58	17.70	-2.17	32.29	22.31	13.05	61.72	9.68	-0.59
1961	75.91	13.23	-4.70	46.65	19.99	12.45	65.02	7.05	-0.99
1962	71.40	7.71	-1.99	38.30	21.95	13.66	62.99	0.23	2.34
1963	72.89	8.44	-3.66	36.14	19.02	9.82	63.27	-0.35	-1.90
1964	65.39	12.84	-6.53	28.17	28.92	10.17	52.50	6.44	-2.32
1965	56.84	16.36	-4.51	23.00	31.66	7.00	42.95	11.60	-1.44
1966	51.42	13.77	-5.03	22.84	31.61	5.46	39.50	10.06	-1.60
1967	51.82	13.22	-2.41	25.63	28.11	4.47	39.38	8.42	-1.42
1968	49.55	8.45	-0.29	23.35	24.00	12.01	37.44	5.61	3.73
1969	46.16	8.21	1.35	25.05	22.03	11.79	35.11	4.60	5.40
1970	44.90	9.31	6.03	22.94	24.50	14.95	33.87	8.61	9.64
1971	45.06	9.99	4.94	22.57	22.81	16.50	35.16	7.61	9.22
1972	39.38	13.20	3.74	22.83	22.68	16.95	31.37	10.71	10.13
1973	34.36	11.56	3.82	23.45	19.38	16.26	28.20	10.65	8.78
1974	45.19	7.70	4.70	32.27	18.09	16.37	39.85	8.15	8.62
1975	53.31	8.60	5.44	35.74	16.21	13.45	44.80	9.57	8.73
1976	47.09	9.90	5.75	35.05	17.08	12.36	42.93	10.80	8.57
1977	46.86	10.15	5.49	36.49	17.60	11.88	44.05	11.04	7.08
1978	39.75	13.31	1.79	32.22	21.01	5.76	37.37	15.63	1.69
1979	38.53	17.83	-3.69	27.66	25.84	3.95	35.10	17.86	-0.78
1980	38.32	21.42	-2.50	28.87	27.17	3.00	37.04	22.12	-1.29
1981	38.31	23.04	-1.40	28.14	31.64	-0.38	35.15	26.31	-1.17
1982	49.52	21.69	0.40	29.11	30.07	1.97	41.93	23.58	1.64
1983	46.07	25.10	1.98	28.67	28.53	0.74	39.79	26.49	0.54

B Additional Tables and Figures for Sections 4



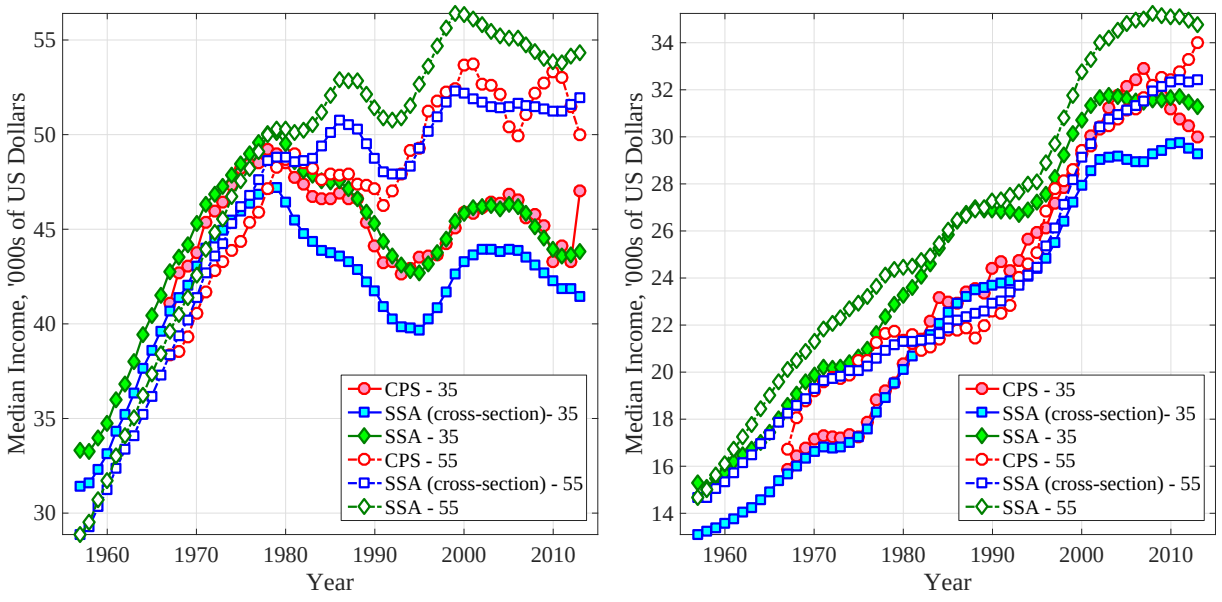
(a) Males (b) Females

Figure B.1: Age profiles of mean log income by cohort



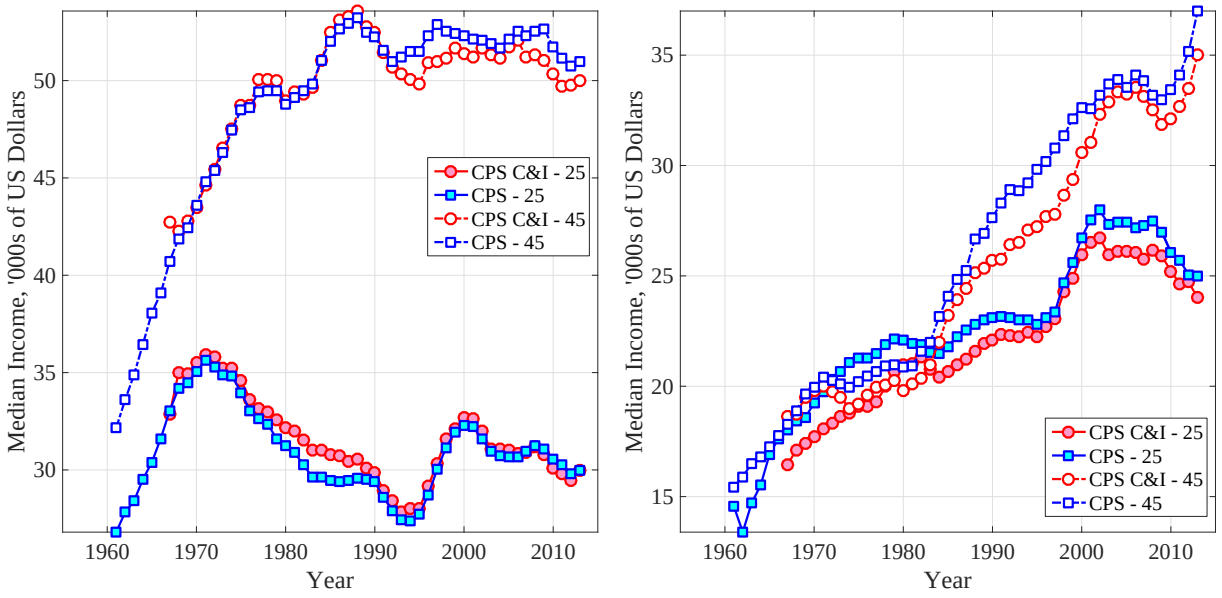
(a) Males (b) Females

Figure B.2: Distribution of Age 25–35 Total Incomes by cohort



(a) Males (b) Females

Figure B.3: Median income by age and cohort, SSA vs CPS



(a) Males (b) Females

Figure B.4: Median income by age and cohort, CPS – Commerce and Industry vs all workers

Table C.1: Fraction of cohort's total lifetime income accruing to each percentile, 1pc sample, selection 0

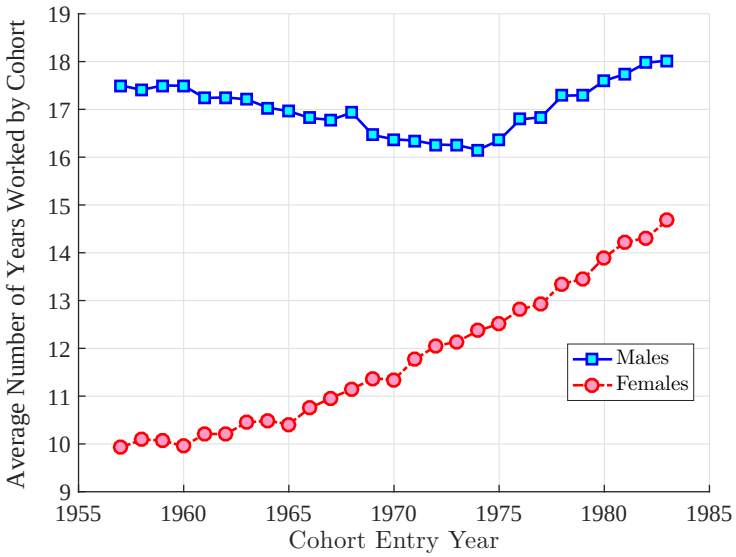
Selection	Cohort	p0p20	p21p40	p41p60	p61p80	p81p90	p91p95	p96p97	p98p99	rest
0	1957	0.1	2.0	8.2	23.6	23.3	16.0	7.8	9.9	9.0
0	1958	0.1	2.1	8.4	23.5	23.2	15.8	7.6	9.8	9.5
0	1959	0.1	2.0	8.4	23.4	22.7	15.7	7.8	10.1	9.8
0	1960	0.1	2.0	8.3	23.7	22.8	15.8	7.8	10.0	9.5
0	1961	0.1	2.0	8.5	23.4	22.5	15.7	7.7	10.1	10.1
0	1962	0.1	2.0	8.4	23.6	22.7	15.6	7.7	10.0	9.9
0	1963	0.1	2.0	8.4	23.1	22.5	15.6	7.7	10.0	10.6
0	1964	0.1	2.1	8.6	23.2	22.5	15.6	7.6	9.9	10.5
0	1965	0.1	2.0	8.2	22.6	21.9	15.3	7.6	10.3	11.9
0	1966	0.1	2.1	8.4	22.9	22.1	15.4	7.7	10.2	11.1
0	1967	0.1	2.0	8.4	22.6	21.7	15.3	7.7	10.3	12.1
0	1968	0.1	2.1	8.6	23.1	21.6	15.1	7.6	10.1	11.6
0	1969	0.1	2.2	8.7	22.7	21.4	15.2	7.6	10.0	12.1
0	1970	0.1	2.1	8.5	22.4	21.4	15.1	7.6	10.2	12.6
0	1971	0.1	2.2	8.7	22.7	21.2	14.9	7.5	10.1	12.7
0	1972	0.1	2.3	8.9	22.5	20.8	14.8	7.6	10.3	12.6
0	1973	0.1	2.4	8.9	22.8	20.9	14.8	7.5	10.1	12.5
0	1974	0.1	2.5	9.2	22.8	20.8	14.8	7.6	10.2	12.1
0	1975	0.2	2.7	9.2	22.7	20.8	14.7	7.4	10.1	12.3
0	1976	0.2	2.9	9.7	23.0	20.5	14.6	7.4	9.9	11.9
0	1977	0.2	3.0	9.8	22.7	20.2	14.3	7.3	9.9	12.7
0	1978	0.2	3.2	10.1	22.7	19.8	14.1	7.2	10.0	12.6
0	1979	0.3	3.3	10.2	22.7	19.8	14.1	7.3	10.1	12.2
0	1980	0.3	3.5	10.3	22.5	19.3	13.8	7.2	9.9	13.1
0	1981	0.3	3.6	10.4	22.2	19.0	13.7	7.2	9.9	13.6
0	1982	0.3	3.6	10.6	22.3	19.0	13.7	7.2	9.9	13.3
0	1983	0.4	3.8	10.7	22.4	18.9	13.6	7.2	10.1	12.9

C Additional Tables and Figures for Section 5

Table C.2: Fraction of cohort's total lifetime income accruing to each percentile, 1pc sample, selection 3

Selection	Cohort	p0p20	p21p40	p41p60	p61p80	p81p90	p91p95	p96p97	p98p99	rest
3	1957	5.2	10.2	16.3	24.6	16.4	10.2	5.0	6.4	5.7
3	1958	5.1	10.1	16.2	24.6	16.2	10.1	4.9	6.5	6.2
3	1959	5.2	10.0	15.9	24.0	16.2	10.3	5.1	6.8	6.3
3	1960	5.1	10.1	16.3	24.1	16.3	10.3	5.0	6.7	6.0
3	1961	5.2	10.0	15.9	23.9	16.2	10.3	5.1	6.9	6.5
3	1962	5.2	10.1	16.0	24.0	16.1	10.2	5.0	6.9	6.4
3	1963	5.1	9.8	15.7	23.9	16.2	10.2	5.1	6.9	7.2
3	1964	5.2	9.9	15.7	24.0	16.2	10.1	5.1	6.9	7.1
3	1965	4.9	9.6	15.3	23.1	15.9	10.2	5.2	7.2	8.4
3	1966	5.0	9.8	15.5	23.5	16.0	10.3	5.2	7.0	7.7
3	1967	4.9	9.5	15.1	23.1	15.9	10.3	5.2	7.5	8.4
3	1968	4.9	9.7	15.3	23.1	15.9	10.2	5.2	7.5	8.1
3	1969	4.9	9.6	15.1	22.9	16.0	10.3	5.1	7.3	8.8
3	1970	4.9	9.5	15.0	22.8	15.8	10.3	5.2	7.2	9.4
3	1971	5.0	9.6	15.0	22.7	15.7	10.2	5.2	7.3	9.4
3	1972	4.9	9.5	14.8	22.4	15.8	10.5	5.4	7.5	9.3
3	1973	4.9	9.6	15.0	22.5	15.8	10.2	5.2	7.3	9.3
3	1974	5.1	9.6	14.9	22.5	15.9	10.4	5.3	7.5	8.8
3	1975	4.9	9.5	15.0	22.6	15.8	10.3	5.3	7.4	9.1
3	1976	5.0	9.6	15.0	22.4	15.9	10.4	5.3	7.2	9.0
3	1977	5.0	9.5	14.8	22.2	15.7	10.3	5.3	7.4	9.8
3	1978	4.9	9.4	14.6	22.0	15.8	10.4	5.4	7.8	9.6
3	1979	4.9	9.4	14.6	22.0	15.8	10.6	5.5	7.8	9.4
3	1980	4.7	9.3	14.4	21.6	15.6	10.6	5.5	7.8	10.5
3	1981	4.7	9.1	14.1	21.3	15.6	10.7	5.5	7.8	11.1
3	1982	4.8	9.2	14.1	21.5	15.7	10.7	5.5	7.9	10.7
3	1983	4.8	9.1	14.2	21.5	15.7	10.8	5.7	8.0	10.3

Figure C.1: Average Lifetime Years Worked by Cohort, *Sample 0*



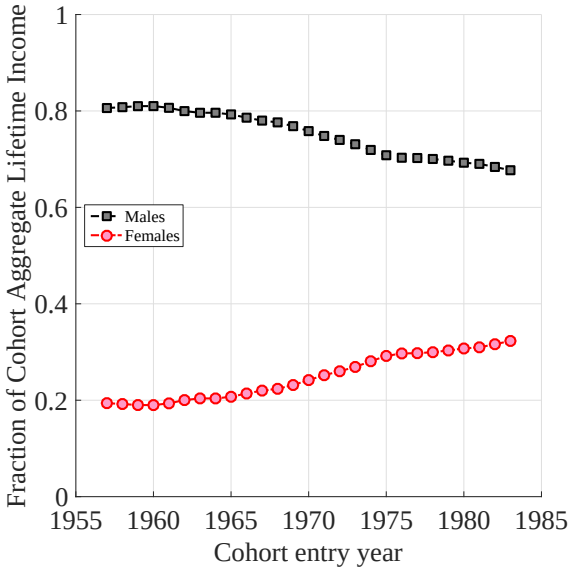


Figure C.2: Share of Cohort Aggregate Income Going to Each Gender Group, no income or years worked selection

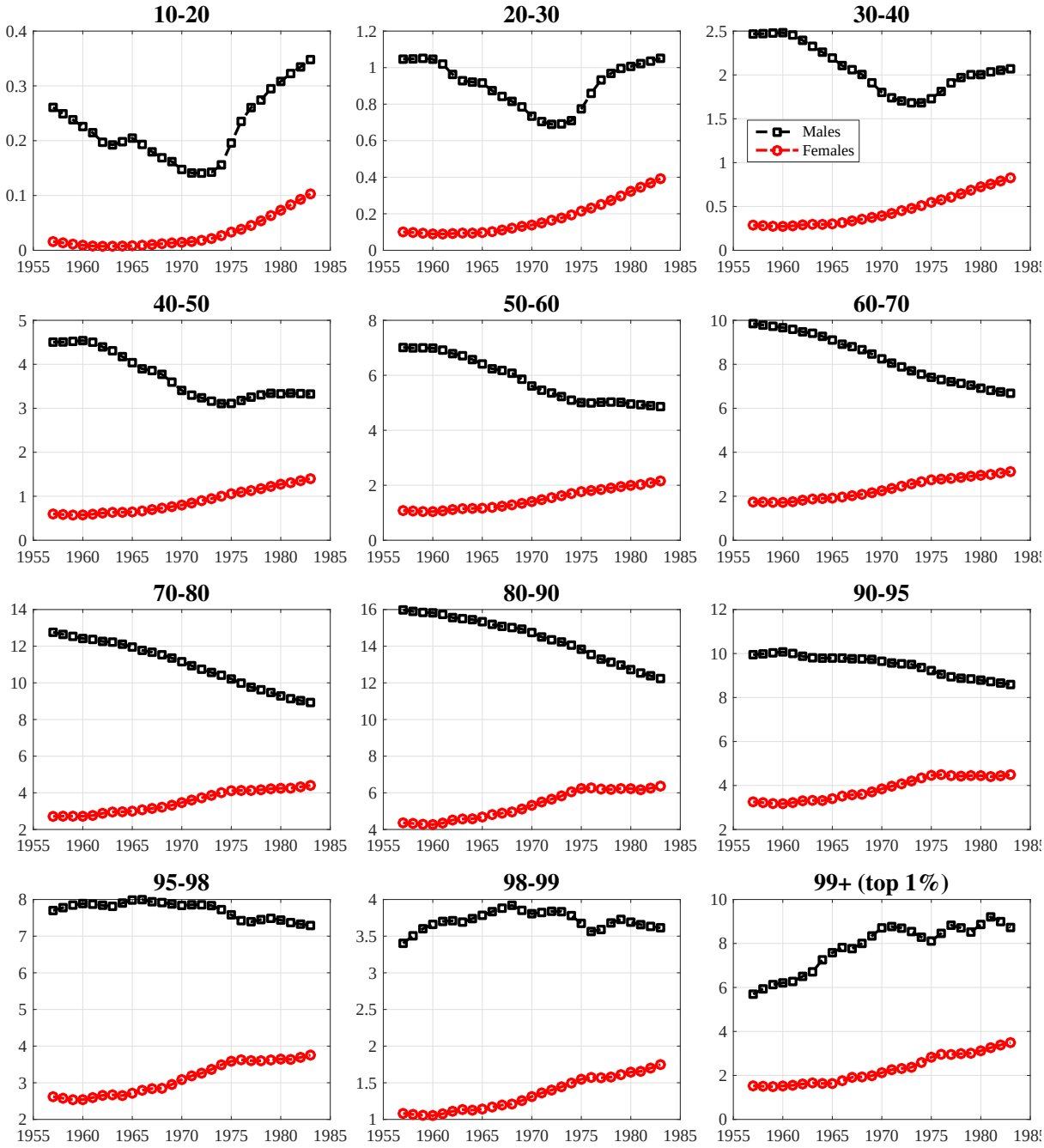


Figure C.3: Share of Cohort Lifetime Income Going to Each Gender / Percentile Groups (indicated by the lower and upper end of percentile thresholds), no income or years worked selection

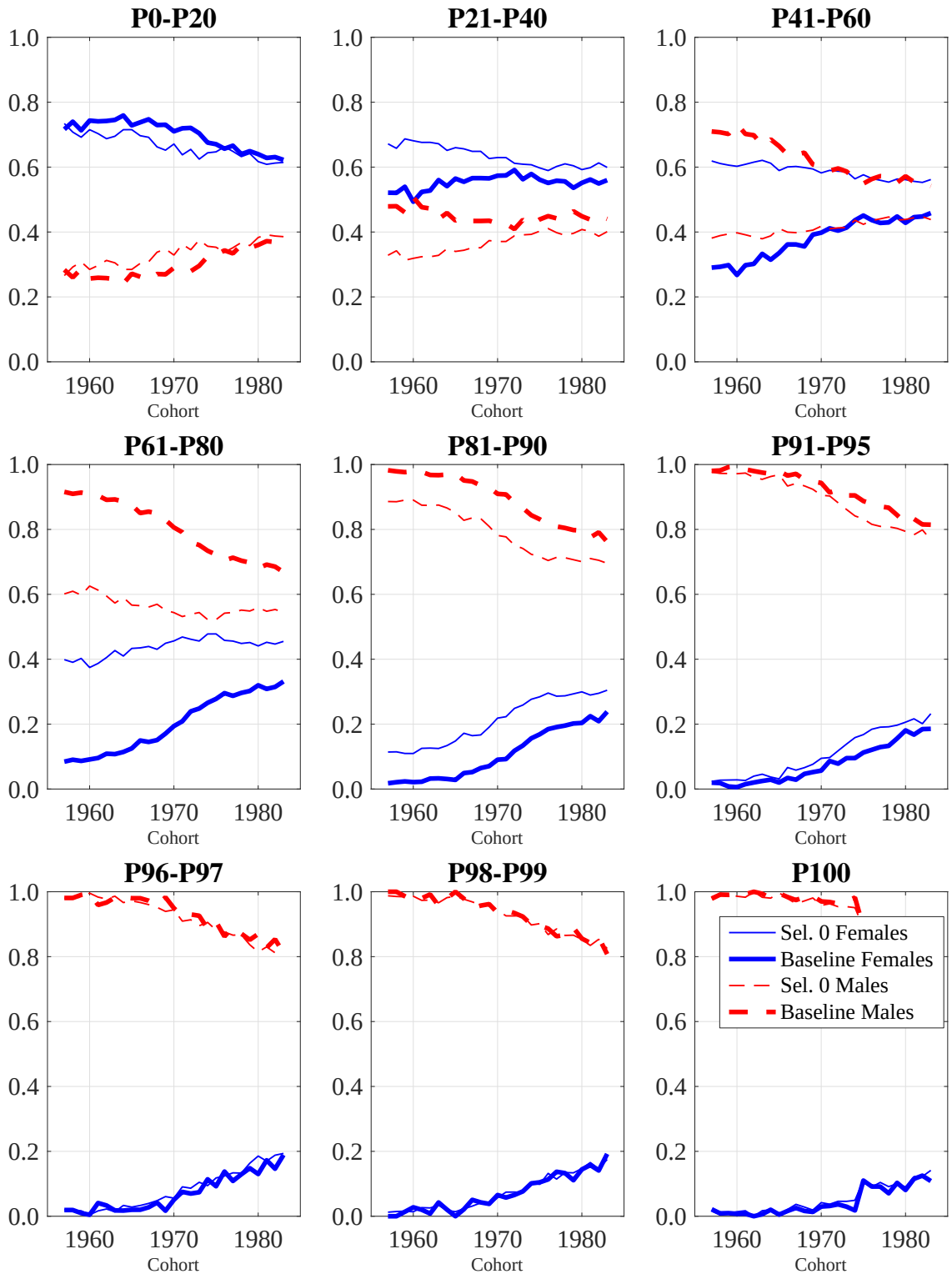


Figure C.4: Fraction of percentile's total lifetime income accruing to each gender in that percentile group, 1pc sample

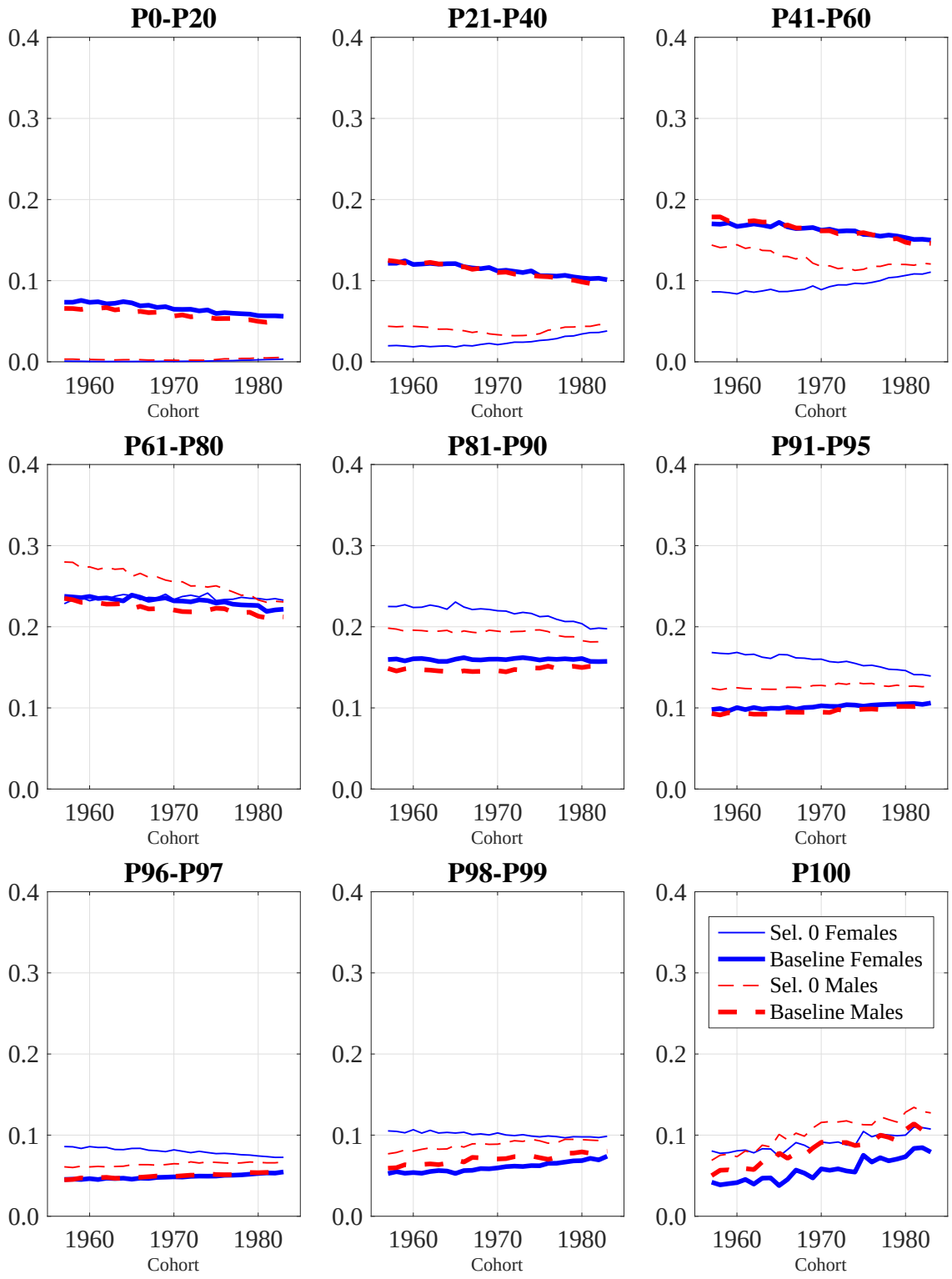


Figure C.5: Fraction of gender's total lifetime income accruing to each gender-specific percentile group, 1pc sample

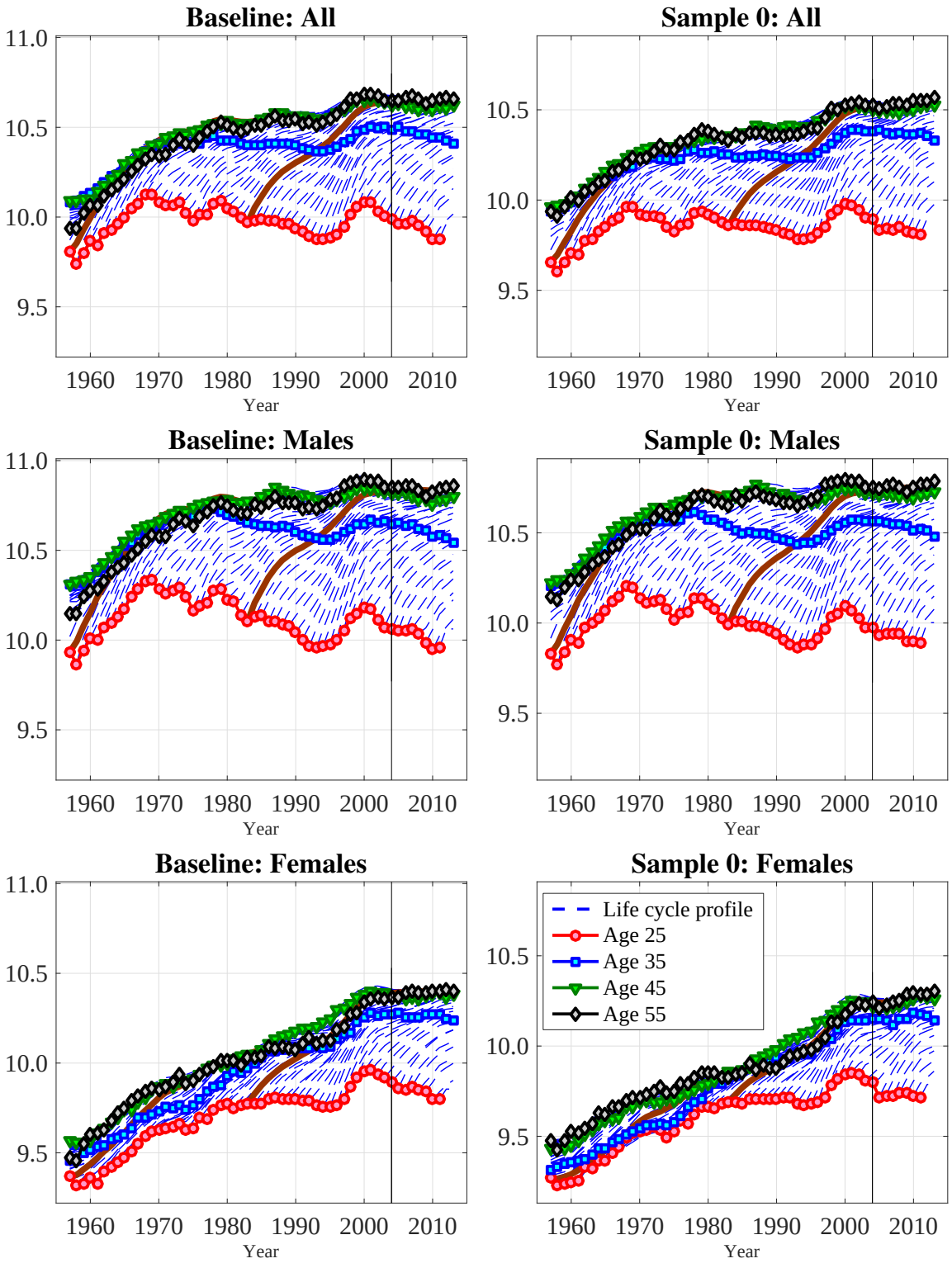


Figure C.6: Mean log earnings, 1pc sample

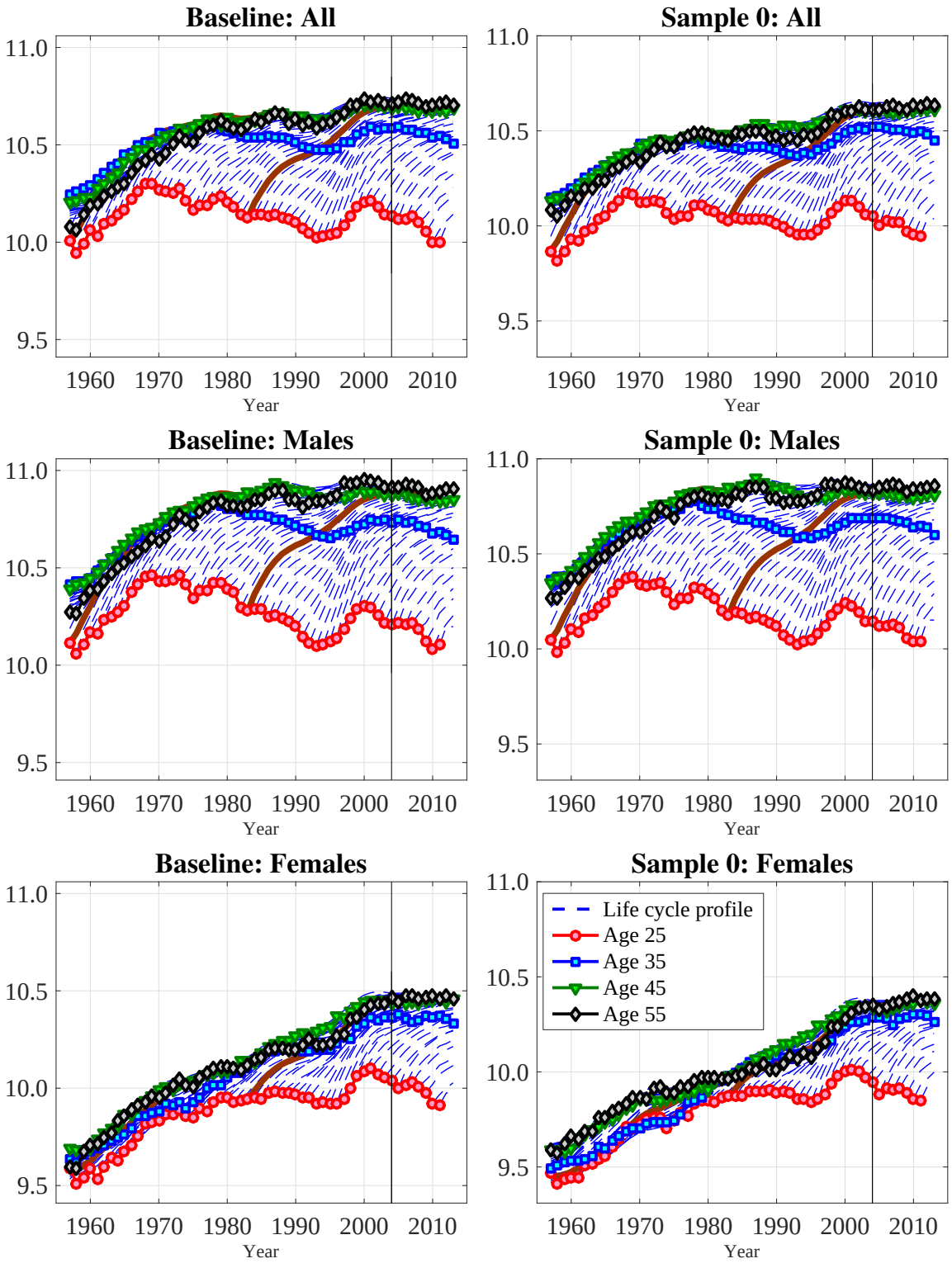


Figure C.7: P50 log earnings, 1pc sample

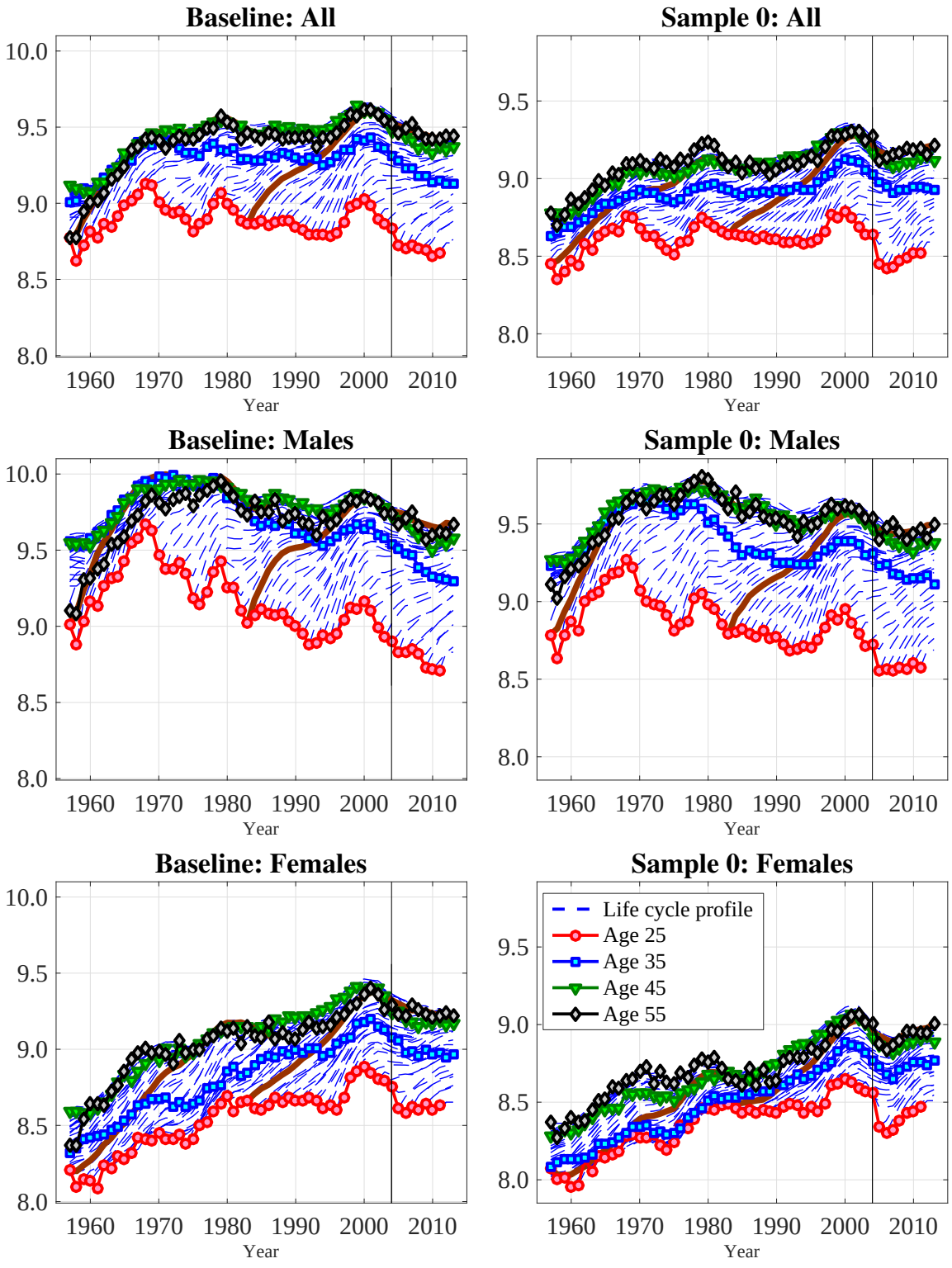


Figure C.8: P10 log earnings, 1pc sample

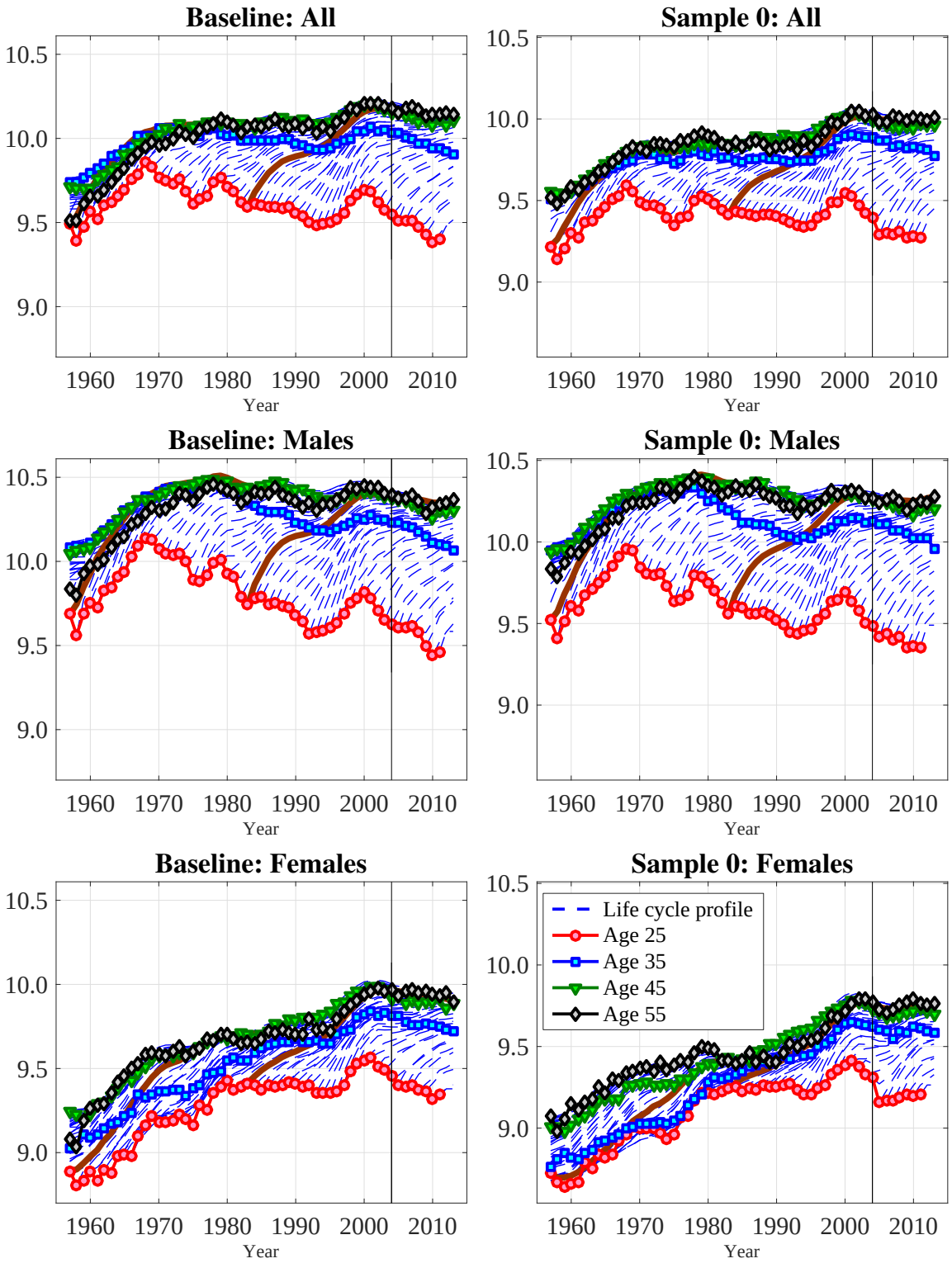


Figure C.9: P25 log earnings, 1pc sample

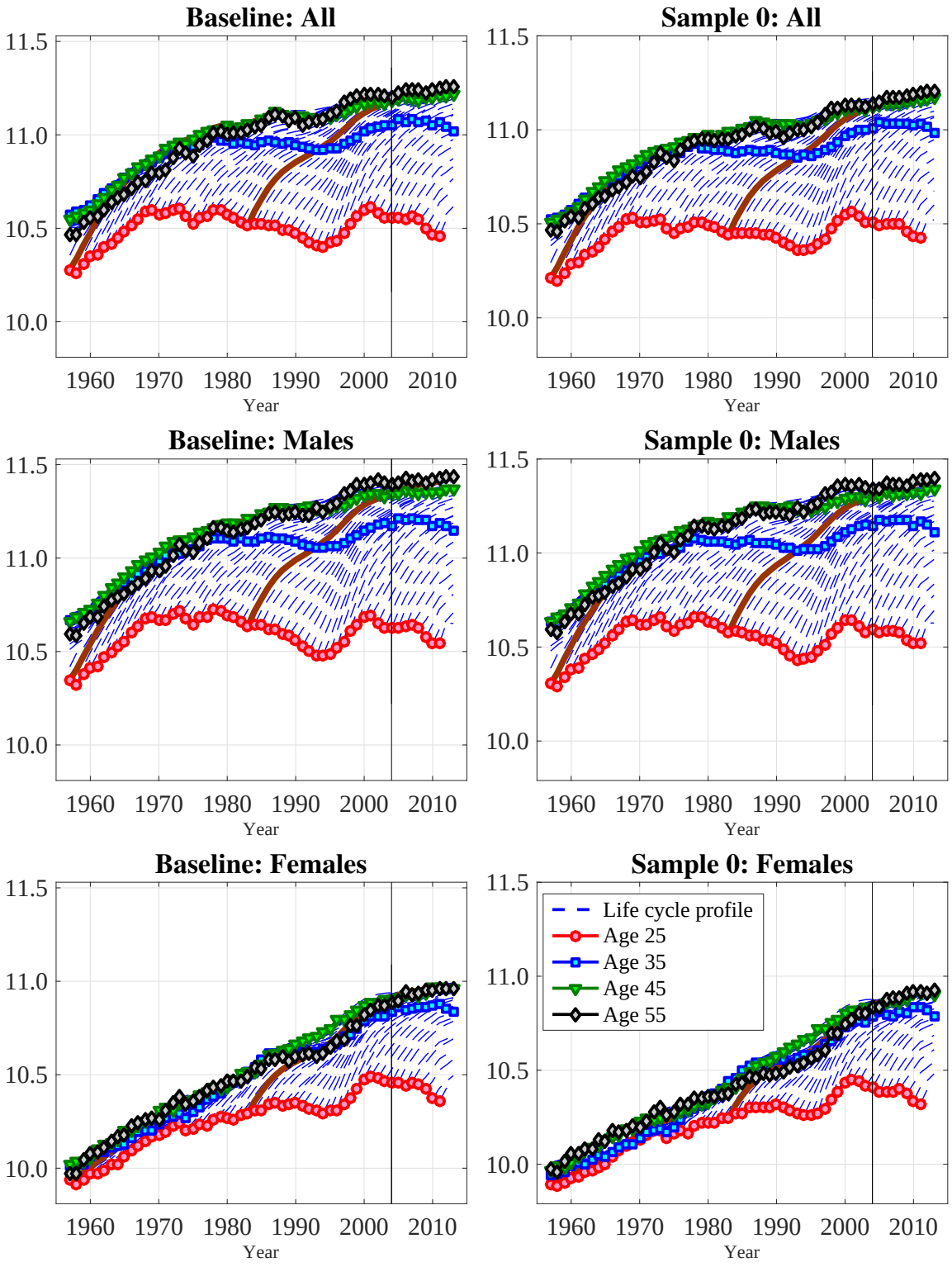


Figure C.10: P75 log earnings, 1pc sample

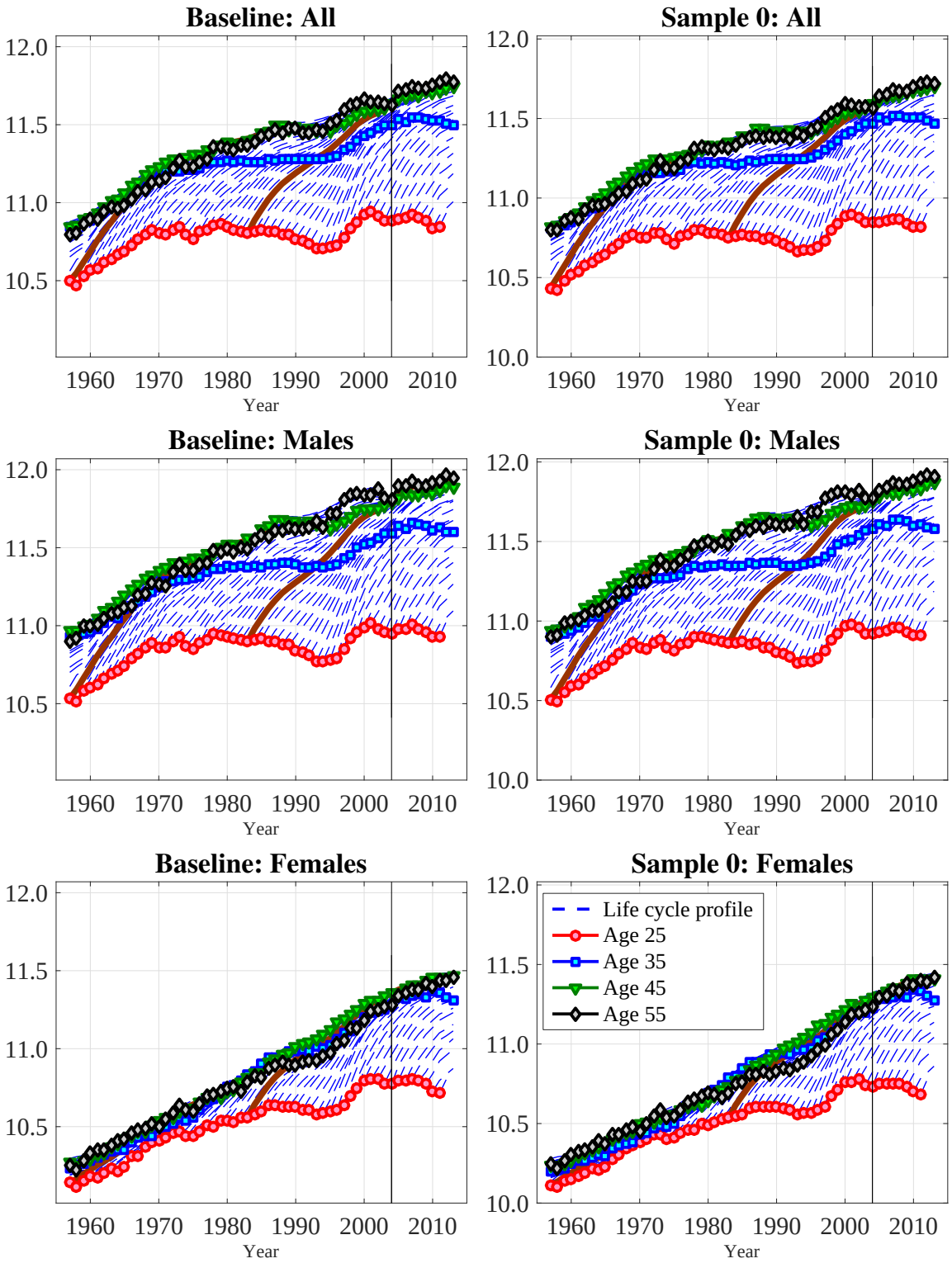


Figure C.11: P90 log earnings, 1pc sample

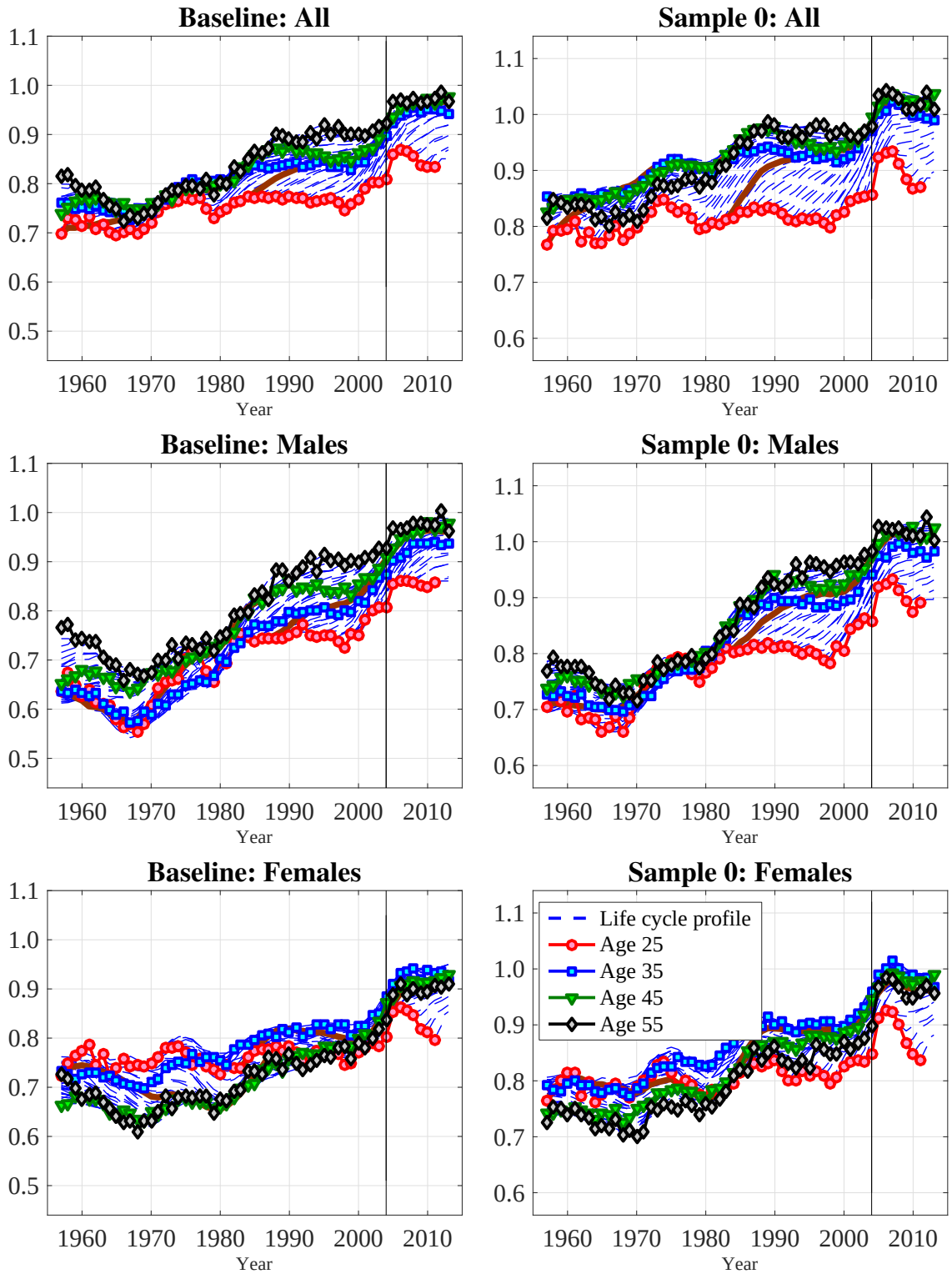


Figure C.12: SD log earnings, 1pc sample

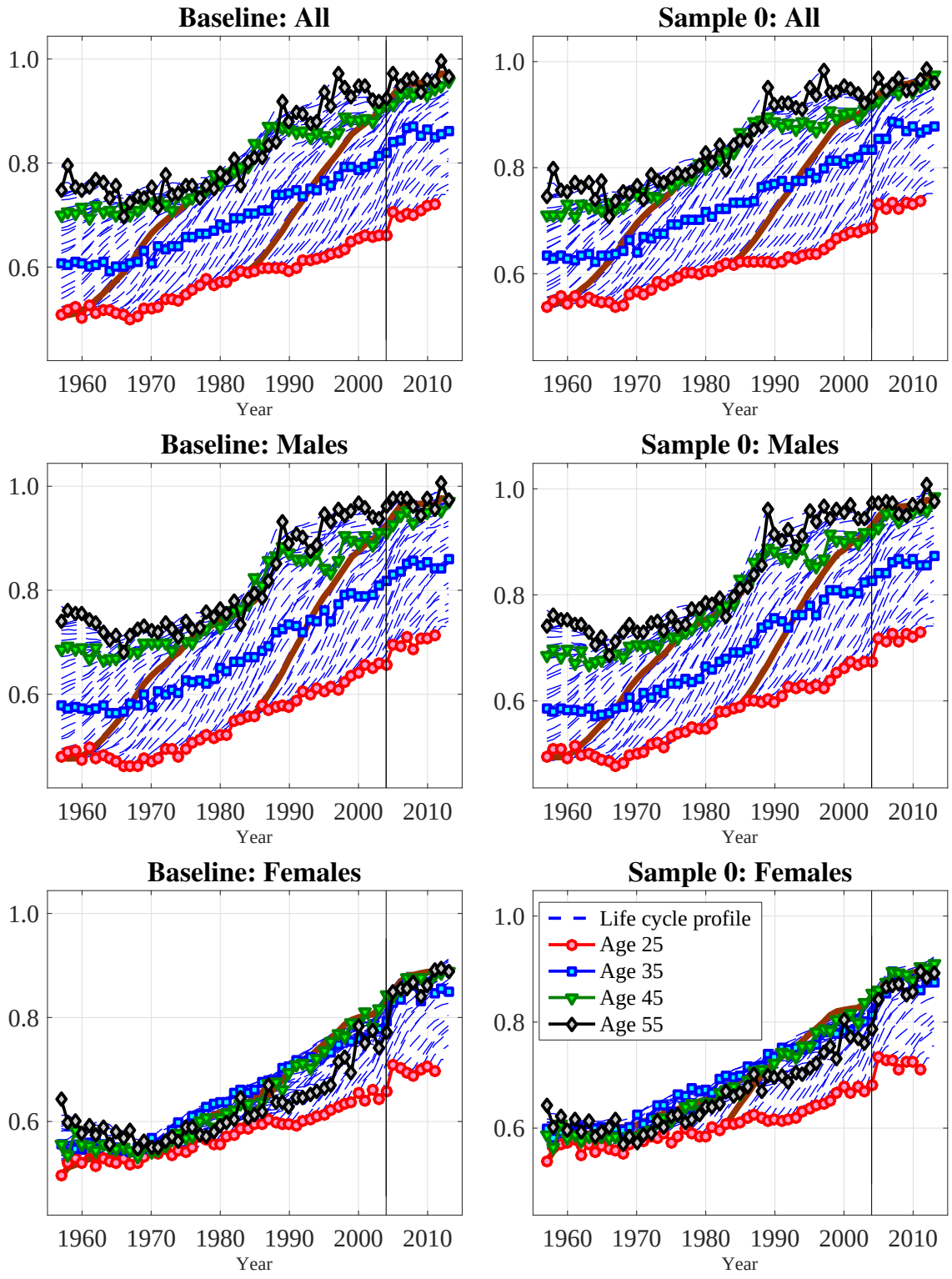


Figure C.13: P98–P50 log earnings, 1pc sample

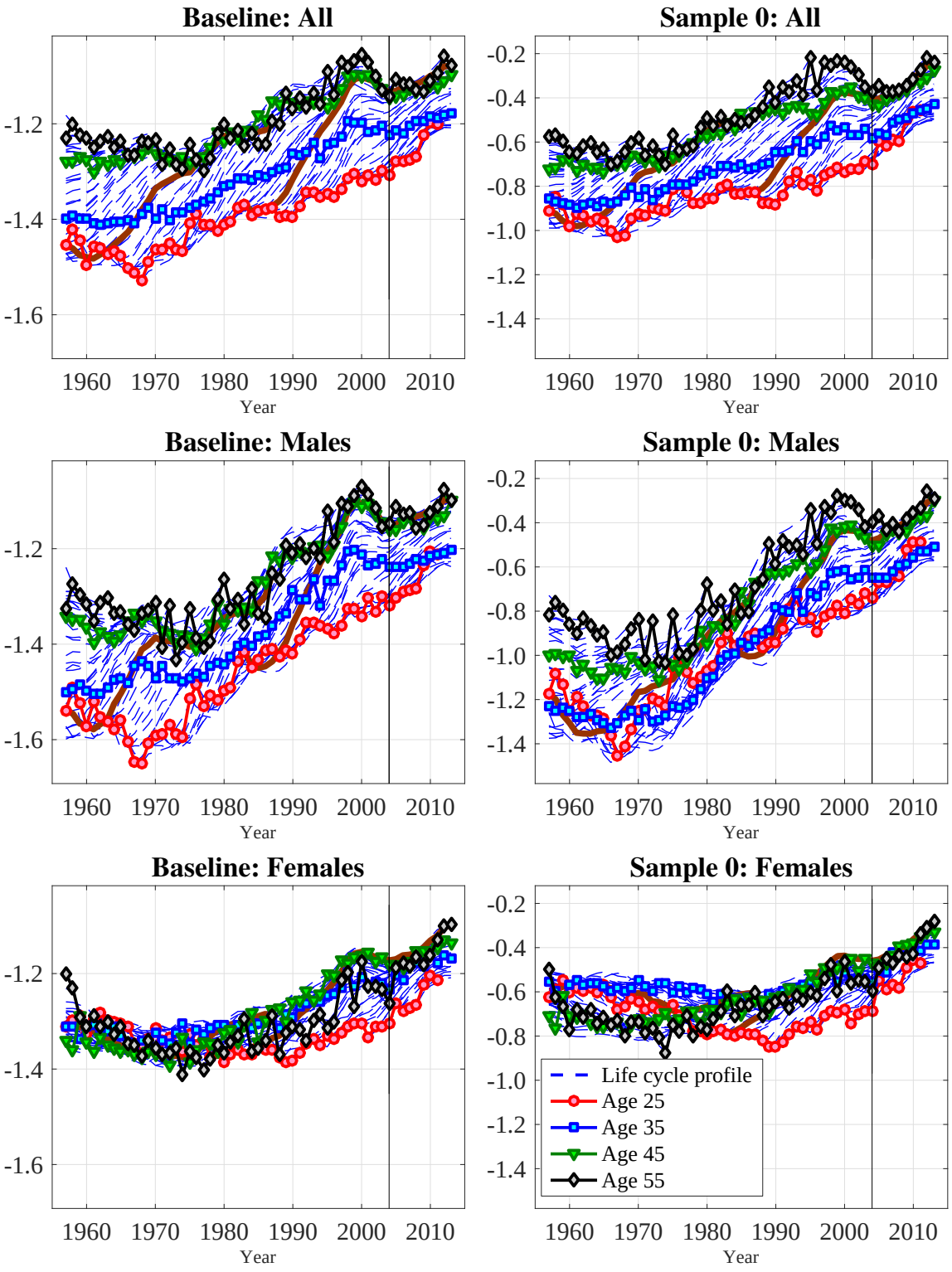


Figure C.14: Skew of log earnings, 1pc sample

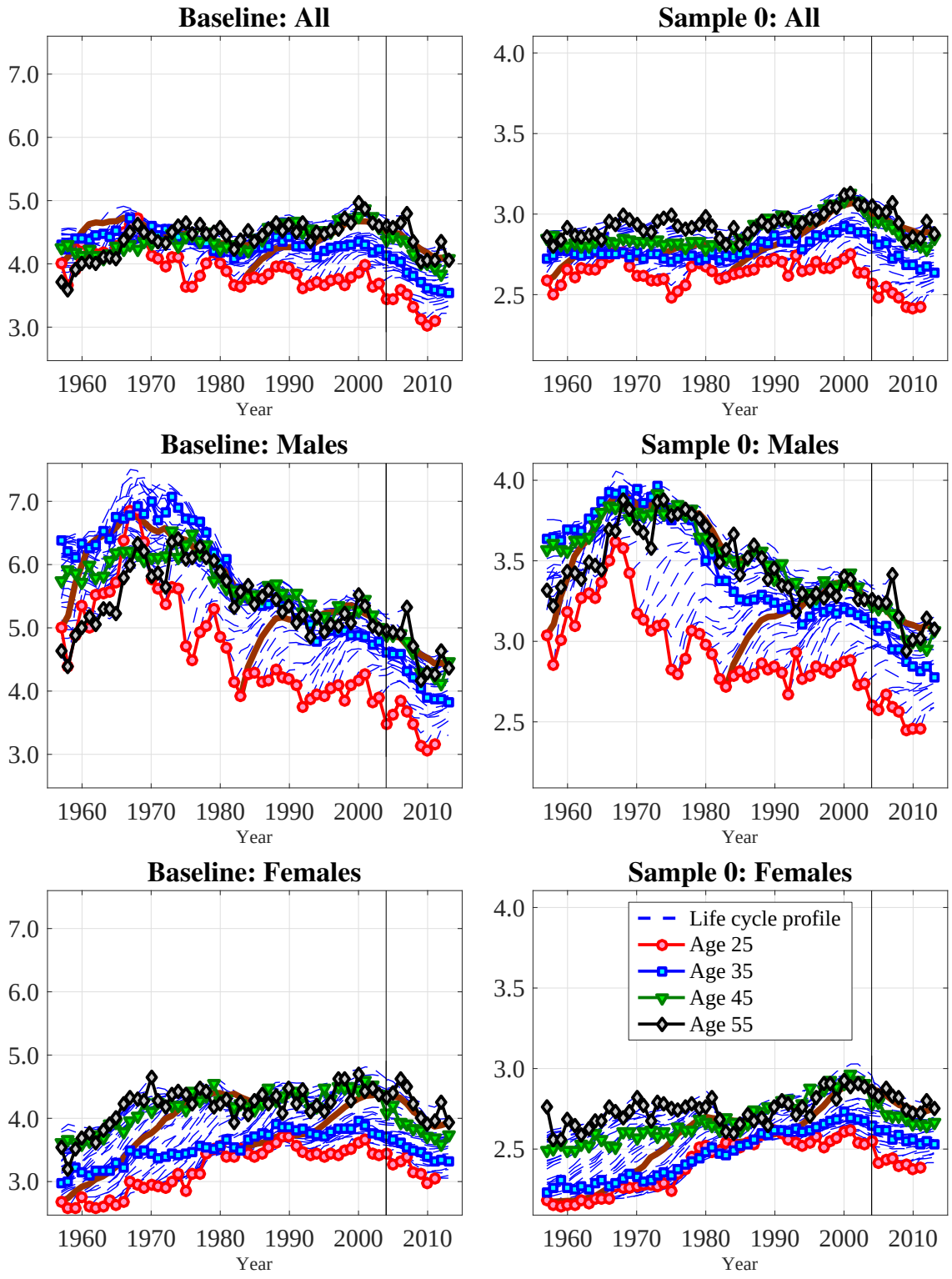


Figure C.15: Kurtosis of log earnings, 1pc sample