Careers of Minimum Wage Workers

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Abstract

We characterize the careers of minimum wage workers by merging SIPP panels covering 1992-2016 into the LEHD. A long-run analysis shows strong earnings growth for these workers in subsequent decades, becoming indistinguishable from peers earning modestly more initially. Most of this growth is due to the steep earnings trajectories of young workers. Older workers earning minimum wages show a modest dip in earnings at that moment compared to earlier and later periods. Increases in state minimum wages do not significantly alter the future careers of workers who are on the minimum wage when the increases occur.

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1 Introduction

The minimum wage is an important policy lever, and a vast literature considers the impact of minimum wages on employment levels and other worker outcomes.[1] Most household datasets, like the Current Population Survey (CPS), follow individuals for a short period, often less than a year. Consequently, few studies consider future outcomes for workers, as further discussed below. This is a material shortcoming, as policy design would benefit from an accurate understanding of the role of minimum wages in careers, including how these spells might differ across the heterogeneous minimum wage population (e.g., teen employment vs. working poor adults). It is also important to know whether increases in state-level minimum wages boost the careers of workers earning minimum wages when increases happen.

To shed light on these dimensions, we develop a unique platform to characterize the long-run career trajectories of individuals employed in minimum wage jobs. We utilize six panels of the Survey of Income and Program Participation (SIPP) from 1993, 1996, 2001, 2004, 2008, and 2014. These panels have multiple waves that cover every year from 1992 to 2016, which we use to cross-sectionally identify individuals earning minimum wages by year. We merge these SIPP records into the Longitudinal Employer Household Dynamics (LEHD) database that runs from the early 1990s to 2021. Our project has access to 25 states, including 22 that start by 1998, for earnings analyses. This combined data platform captures the full LEHD career dynamics of individuals who were earning minimum wages at the time of their SIPP observation, looking at their careers before and after.

Our project emphasizes several aspects of the long-run careers of minimum wage workers.

- As a cohort, minimum wage workers display subsequent careers that achieve earnings levels comparable with peers who initially earned more than them. This convergence may take a decade or longer to achieve. The upward growth in earnings for a cohort of minimum wage workers is stable over SIPP panels, indicating a robustness to economic features like business cycles.

- The key factor behind the earnings growth of a cohort is that most minimum wage workers are young, less than 30 years old. These young workers display particularly

[1] Recent reviews include Clemens (2021), Manning (2021), Neumark and Shirley (2022), and Dube and Lindner (2024).

strong earnings growth. Earnings growth is strongest for young workers living in better-off families, but it is noticeable even for minimum wage workers in their mid-to-late 20s living in poor families.

- Older minimum wage workers experience less earnings growth than their young counterparts. Nevertheless, the minimum wage episode represents a nadir in their career earnings. Both earlier and later earnings for these workers are higher on average than their earnings when they are observed on the minimum wage.

- State-level increases in minimum wages have limited impact on the future careers of the workers who are earning minimum wages when increases are enacted, in large part because most minimum workers quickly transition out of earning minimum wages.

Our long-run portrait of the careers of minimum wage workers builds from two samples. The first sample follows 30,000 workers aged 15-49 during 1994-1998 who are observed working in the corresponding SIPPs and LEHD. Of these workers, 4,000 are earning at or near minimum wages in the SIPP files. By 2021, this cohort of minimum wage workers will more than triple their earnings in inflation-adjusted values, placing them near the median of the overall earnings distribution. This panel demonstrates the convergence of minimum wage workers to the earnings of initially better-paid peers, and extensions shows that rates of future employment (e.g., share of years in paid work or self-employment nationally) are also comparable. We use the panel to explore the long-run heterogeneity by age and family income, as well as other demographic features like sex and race.

Our second panel constructs a similar sample of 4,700 workers earning minimum wages during 2005-2009. The short- and medium-run career trajectories of this later cohort are very similar to the 1994-1998 cohort, demonstrating a robustness to time periods and economic cycles. The longer span of prior career information for this cohort also reveals modest dips in earnings for older individuals when they are observed earning minimum wages compared to earlier or later periods (Ashenfelter 1978).

This work culminates in a final sample of more than 13,000 minimum wage workers collected from all six SIPPs across 1992-2016. We utilize a stacked analysis framework that indexes time from the date of the minimum wage experience. This combined dataset continues to emphasize the upward employment and earnings growth of young workers, which account for 74% of our

sample of minimum wage workers. Individuals from better-off families earn more going forward than those from poor families, but the age of the worker is the strongest predictor of future earnings growth.

The final part of this paper explores whether increases in state minimum wages link to stronger future careers of workers earning minimum wages at the time of the increase. Our first cut at this employs the 1994-1998 long-run panel. State minimum wage mandates were quite rare during the 1990s, as seen in Figure 1, yet from 1998 onwards, six states in our sample (California, Connecticut, Delaware, Maine, Washington, and Wisconsin) established state-level minimum wages that ultimately exceeded the federal rate by at least $1.00 in 2006. When dividing our sample, the future earnings growth for past minimum wage workers in these six states is significantly higher than in our other 15 states. Yet, this is mostly a state-wide earnings phenomenon, with all incomes in these six states rising, and there are no material differences in the relative positions that minimum wage workers from the 1990s achieve within their state's earnings distributions compared to peers in states staying at or near the federal rate.

Second, we use our stacked analysis framework with all SIPP panels to evaluate whether increases in state minimum wages link to stronger career trajectories over a seven-year horizon during the 1992-2021 period. The stringent estimations control for many individual traits, and by including non-minimum-wage workers, we can model state-year fixed effects. We see some evidence for a short-run earnings boost during the first year after the policy change. A 10% relative increase in state minimum wages over a three-year period links to a 4.3% increase in cumulative earnings over the same period for minimum wage workers. We do not, however, detect a cumulative effect over a seven-year horizon for earnings nor quarters worked. This suggests the career impact was small and short-lived.

Our longitudinal portrait of careers is a useful complement to prior studies of minimum wages. We directly contribute to a small group of studies considering the careers of minimum wage workers, usually on time horizons of a year or less. The SIPP was used for some of the earliest work, captured by Smith and Vavrichek (1992), Schiller (1994), Long (1999), and Even and Macpherson (2003). In these studies, more than half of minimum wage workers are earning more than the minimum wage within one year. Carrington and Fallick (2001) use the National Longitudinal Study of Youth to show that most individuals quickly leave minimum

wage work as their career progresses, but a small share of young adults have multiple spells earning minimum wages early in their careers.[2]

More recent work extends and deepens these longitudinal profiles. Using the 2010-2019 CPS, Clemens and Strain (2023) show minimum wage workers are moderately more likely to receive raises within the first year after state increases (79% vs. 70%), but that other aspects of career progression and levels of labor demand are more important for worker income growth. Gopalan et al. (2021) use Equifax data to examine the impact of six large increases in state minimum wages during 2014-2015. The earnings of incumbent workers increase, especially those with longer time at the firm, and without a change in hours. Jardim et al. (2018, 2022) quantify that Seattle's 2015 and 2016 increases in the local minimum wage raised earnings for minimum wage workers with above-median experience levels compared to matched workers elsewhere in the state over two years.[3]

Several studies examine how high minimum wages in early life may alter education versus employment decisions of youth, potentially with negative long-term effects for careers (e.g., Neumark and Nizalova, 2007; Schanzenbach et al., 2024). While our study does not analyze these types of decisions regarding work versus human capital investment, the long-term patterns that we document (and the benchmarking of the future earnings of minimum wage workers relative to the earnings distribution overall) will include the net consequences of these choices.

More generally, many studies have used the SIPP to study minimum wage workers, enabling direct integration of our work to prior literature. Clemens and Wither (2019) emphasize the importance of macroeconomic context in shaping observed wage trajectories. Rinz and Voorheis (2018) use U.S. administrative data to explore the earnings responses through the income distribution from minimum wage changes. Their estimates at the lower end of the earning distribution are comparable to some of our work on state policy changes. Meer and West (2016) examine employment dynamics around minimum wage changes.[4]

[2] Schiller (2011) also uses the NLSY to characterize how many adult minimum wage earners are using the job for supplemental earnings. Currie and Fallick (1996) analyze employment responses to federal minimum wage increases in 1979 and 1980. Classic work considers the steep earnings profiles for young workers with skill development (Murphy and Welch 1990; Topel 1991; Topel and Ward 1992).

[3] Outside of the United States, Stewart (2004) provides evidence from a U.K. reform in 1999-2001, Cardoso (2009, 2019) considers career dynamics of youth cohorts in Portugal exposed to different minimum wage policies, and Paul-Delvaux (2024) explores career dynamics from a large policy change in Morocco.

[4] Classic and recent work on employment effects includes Card and Krueger (1994), Neumark and Wascher (2007), Dube et al. (2010), Cengiz et al. (2019), Harasztosi and Lindner (2019), Clemens et al. (2021),

Section 2 describes our data development. Section 3 presents our work on career profiles, and Section 4 analyzes profiles in light of minimum wage policy changes. The final section discusses the findings, with attention given to their interpretation for debates about segmented vs. unified labor markets.

2 Data Development

This section describes our data development process. While our career trajectories for workers are built upon confidential Census Bureau datasets, we often use the publicly available versions of the SIPP files to provide descriptive statistics about our sample and elucidate its features. We label this external resource as the "public SIPP" to distinguish these statistics from those disclosed with confidential matched SIPP-to-LEHD data.

The Survey of Income and Program Participation (SIPP) is a nationally representative longitudinal survey collecting monthly information on income dynamics, employment, government program participation, and many other topics related to the economic well-being of individuals in the United States. The SIPP is particularly helpful in studying minimum wage workers given its emphasis on poor families (with weights to be nationally representative).

2.1 1994-1998 and 2005-2009 Cohorts

Our long-run sample using the 1994-1998 cohort starts with individuals in the 1993 SIPP (waves 4-9) and the 1996 SIPP (waves 1-10) that cover calendar years 1994-1998. These years were chosen to balance long future career trajectories for workers with including a large number of states (as the start date for LEHD records differ by state and we seek a balanced panel for future earnings). By 1998, we have 22 states in our LEHD sample: Arizona, California, Colorado, Connecticut, Delaware, Kansas, Maryland, Maine, Missouri, Montana, North Dakota, New Mexico, Nevada, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, Washington, Wisconsin, and Wyoming.

In the public SIPP, just over 170,000 individuals were surveyed nationwide during 1994-1998, of whom 94,000 are 15-49 years old. We limit at age 49 to allow an extended future career from the late 1990s, but this restriction is not significant as the public SIPP data attest that the 15-49 age range captures most workers earning minimum wages. Once we further restrict to the

Derenoncourt and Montialoux (2021), Dustmann et al. (2022), Azar et al. (2024), Clemens and Strain (2025), and Clemens et al. (2025).

22 states, the public SIPP contains 39,140 individuals, of which 30,888 are observed working and with wage information. Appendix Table 1a documents the strong SIPP-LEHD match rate, linking 77% of the available SIPP records, inclusive of non-workers, to a corresponding LEHD worker. This match is quite similar regardless of age and family income levels. We require individuals to be recorded working in the LEHD during 1994-1998, dropping cases where the individual is in the SIPP but only appears in LEHD after 1998. Post SIPP-LEHD match, our primary sample includes 30,000 individuals. All observation counts with internal data are rounded per Census Bureau disclosure requirements.

We define a minimum wage worker in the 1994-1998 sample as those earning $5.50 or less per hour. Following prior literature, we include in the minimum wage group a small band of salaries slightly above the federal minimum wage, which was set at $4.25 in 1991, $4.75 in 1996, and $5.15 in 1997. The next increase of the federal minimum wage to $5.85 occurs in 2007. The measured wage is the average of all monthly SIPP observations for an individual during the years surveyed. In most cases, we observe a direct reporting of the hourly wage. We also calculate the implied wages of workers from their earnings, usual hours worked, and usual weeks worked. These implied wages are used for individuals where hourly wages are not directly reported.

In the 1994-1998 sample, approximately 4,000 individuals are earning minimum wages, representing 13% of the matched sample. We also define three other wage groups from the initial period: not working or no wage observation (e.g., self-employed), those earning $5.51-$7.00 per hour, and those earning more than $7.00 per hour. Appendix Figure 2 shows the hourly wage distribution with the public SIPP data for 1994-1998. In the public SIPP, a comparable 17.2% of workers with wages are found to be earning near the minimum wage during 1994-1998.

We define four groups based upon age and total family income during 1994-1998. The age split is young (15-29) vs. older (30-49). Extensions separate those 15-22 vs. 23-29 years old. By age 30, the prevalence of a cohort being close to the minimum wage reaches something close to long-term stability pre retirement years (Carrington and Fallick 2001; Neumark and Kala 2024). We also separate individuals based upon family income, defining "poor" families to be those with $3000 or less per month (nominal value) in total family income during 1994-1998. We label higher income families as "richer", although most of these families are middle class.

In the public SIPP, the median family income during 1994-1998 is slightly more than $4000 per month (nominal value).[5] Figure 2 plots the share of workers earning at or near minimum wages by age and family income profile.

With these demarcations, our full 15–49-year-old sample is comprised of 21% older-poor workers, 32% older-richer workers, 24% young-poor workers, and 22% young-richer workers. Our minimum wage sample skews younger and poorer, with 19% being older-poor workers, 6% older-richer workers, 40% young-poor workers, and 35% young-richer workers.

The LEHD contains person-level quarterly earnings information for individuals derived from state unemployment insurance filings. Our project has access to 25 states, with 22 starting by 1998.[6] The LEHD includes all private sector employers, as well as state and local public sector employees. For our matched individuals, we measure across our 22 states the quarters they work per year and, conditional on working, their annual earnings (across all jobs where applicable). Those not present could be working for the federal government, be self-employed, be unemployed, have moved out of the 22 states, or be deceased. An extension uses the LEHD National Employment Indicators file and the Integrated Longitudinal Business Database (ILBD) to examine total labor force participation (paid employment and self-employment) of all workers in all states and DC. The National Employment Indicators file identifies whether an individual is working in the LEHD in a given year, including in states outside of the 25 for which we have wage data. The ILBD, sourced from Schedule C tax filings, identifies nationally individuals who have self-employment earnings in a year.

Our minimum wage sample is similarly positioned in the earnings distributions of the two datasets. Our sample averages to the 17.2 percentile in terms of total personal earnings among those aged 15-49 in the SIPP data. In the LEHD earnings distribution, our sample averages to the 17.7 percentile. Appendix Table 2a further shows that the average percentiles of subgroups when parsing by age and family income are also very similar between the two data sources.

Appendix Table 3 provides a bottom-up comparison of public-SIPP-derived earning compared to the LEHD averages, to be discussed later. Earnings levels are quite close, and the

[5] We use nominal values for hourly wages and family incomes when using the SIPP records to define individuals for our sample. Once we move to the LEHD and future career trajectories, we use real, inflation-adjusted earnings estimates defined in 2021 dollars.

[6] Our 25 states account for about half of the U.S. population and is quite representative of the country. Of the five most populous states, our sample includes California and Pennsylvania but lacks Florida, Texas, and New York.

rank ordering of the subgroups defined by worker age and family income are the same. Workers defined through direct reporting of hourly wages represent 91.6% of the sample. These workers in the public SIPP earned an average wage of $4.80 and worked 29 hours per week. About 7% of them had a second job, where the mean wage was $5.26. For the small portion of the public sample with an implied minimum wage, the estimated wage is $4.03 with 39 hours per week.

We complement the 1994-1998 panel with a second SIPP-LEHD match that covers 4,700 minimum wage workers from 2005-2009. For these years, the minimum wage group includes those earning $7.50 or less per hour. We also use $4,000 in nominal monthly income in the SIPP to separate poorer from better-off households, resulting in a sample that is 18% older-poor workers, 7% older-richer workers, 41% young-poor workers, and 35% young-richer workers.[7]

2.2 Combined SIPP Panels, 1992-2016

Our final set of analyses use a dataset that combines LEHD records from 1992-2021 and SIPP records from 1992-2016 contained in the 1993, 1996, 2001, 2004, 2008, and 2014 panels (all waves). The merging process and match rates are similar to what has been described for the above panels. We define for individuals a primary year t that is the mid-point of their multi-year SIPP records, taking the earlier year in the case of even-numbered year spans. For example, a focal year of 2005 is assigned to individuals observed 2004-2007 in SIPP. Career progression is then measured in time since the focal year t.

While our two long-run panels use a single definition of the minimum wage nationally to define the samples, the many states and years incorporated into this panel require that we define relevant minimum wages for these workers to be the maximum of the state and federal rates applicable to the SIPP state (Vaghul and Zipperer, 2022).[8] This dataset contains more than 13,000 workers earning minimum wages at the time of SIPP observation.

The three panels of Figure 3 provide descriptive features of the matched sample. Panel A

[7] The later starting point allows us to incorporate Massachusetts, Oklahoma, and Utah for a total of 25 states. Appendix Tables 1b and 2b document the build of this sample. Appendix Tables 4 provide descriptive statistics on our two long-run panels.

[8] More precisely, the minimum wage group includes those with hourly wages less than the applicable minimum wage plus $1.00, rounded to nearest 0.25 cents. For example, a state minimum wage of $6.18 would correspond to a minimum wage group that includes those earning $7.25 or less. We do not consider city-level minimum wages. The next higher wage band will be those with hourly wages more than $1.00 higher than the state minimum wage but within $2.50.

Work at the Census Bureau also evaluated the robustness of using state minimum wage levels to define the sample for the for the two long-run panels, with us selecting to disclose the series based upon the simpler national definition for those two panels.

compares the share of minimum wage workers by age and family income background in the public SIPP data compared to what we match with the LEHD. The LEHD matched sample has modestly higher match rates for young workers from richer families than poor families, with the overall distributions being extremely close. Panel B showcases that for matched workers, we find almost identical average positions in the earnings distribution of the SIPP data and the LEHD data. Finally, Panel C provides the overall income distribution of the families of the minimum wage workers. We return later to additional preparation steps and descriptive statistics on this combined SIPP panel when launching our analysis.

3 Empirical Results - Career Trajectories

3.1 Analysis of Long-Run 1994-1998 Cohort

Panel A of Figure 4 shows the average annual earnings of the matched sample conditional on employment in a period. We use year groups for disclosure of our results from the Census Bureau: 1990-92, 1993-95, 1996-98, 1999-2001, 2002-04, 2005-08, 2009-12, 2013-16, and 2017-21. The youngest members of our sample will not be present in the pre-period of 1991-93. Dollar values are expressed in real 2021 dollars. We winsorize earnings at the 5th and 95th percentile values by year to focus on central tendencies of the data. We have also analyzed median values internally but prefer mean values given the more straightforward disclosure of confidence intervals.

Individuals initially earning the minimum wage during 1994-1998 see extensive growth in their subsequent earnings, from around $13,500 on average during the initial period to more than $45,000 (both figures in real 2021 dollars). As we will uncover, much of this growth is from the future trajectories of young workers. By 2017-2021, the earnings of the minimum wage group become indistinguishable from those who earned $5.51-$7.00 in the initial period, with the earnings of those earning more than $7.00 in the initial period remaining significantly higher than both.

Panel C of Figure 4 plots these series in relative terms to the overall earnings distribution (including all age groups within each year). Income levels in the United States grew during the last three decades, and this graph looks at the relative performance of workers compared to others. We convert each worker's annual earnings into a percentile of their state's earnings

distribution for that year.[9] The figure presents the averages, showing the minimum wage workers rise from around the 23rd percentile to be near to the median. Some of this growth is a natural consequence of the 1990s minimum wage cohort getting older, with incomes for workers typically rising with age.[10]

Table 1 provides a broader description. Panel A considers all SIPP workers using broad wage groups in 1994-98. Columns 1-3 consider average quarters employed in the LEHD in our 22 states during the years observed. This analysis does not include zero values if a worker is not present in a calendar year. We document values for the initial period, for the next ten years ending in 2008 just before the Great Recession, and for the subsequent 12 years through to 2021. The first ten years of 1999-2008 are particularly useful for age-based comparisons as our sample remains younger than 60 through 2008.[11] As the sample ages, its average quarters worked rises, with the initial gaps of the minimum wage sample diminishing.

Columns 4-6 similarly show average real earnings of individuals observed in the LEHD in 2021 dollars. The estimates do not infer a zero value if an individual is not present in the LEHD (with Columns 1-3 speaking to participation rates). Again, the minimum wage group substantially closes the gap to those who earned $5.51-$7.00 initially. Columns 6-9 document the state percentile tabulations.

3.2 Heterogeneity within Long-Run Cohort

Panels B and D of Figure 4 separate the minimum wage sample into our four age-income groups, with Panel B of Table 1 tabulating values.[12] The career dynamics of the four groups are quite heterogeneous. Older minimum wage workers who were living in poor families (20% of the core sample) show limited subsequent earnings growth. While there is some modest gain in the early 2000s, by 2021 they are in very similar positions to the 1990s relative to state earnings distributions.

[9] We mostly use five-percentile bands (e.g., giving a 7.5% value to those falling between the 5th and 10th percentiles). For the tails, we model 1%, 5%, 95%, and 99% percentiles. While Panel A of Figure 4 combines earnings from jobs of a worker across state lines, the state-indexed series only considers the earnings of individuals in their primary state (with same condition also applied to others to form the state earnings profile).

[10] It is important to note this figure captures an earnings distribution percentile, combining wage rates and time worked, and does not measure an hourly wage distribution percentile. It also does not include non-earners.

[11] With the staggered start of states in the LEHD, the panel is unbalanced for states before 1998. Measures for before 1998 are only for states already present in the LEHD. For 1998 and after, the panel is balanced.

[12] Appendix Tables 5a and 5b provide comprehensive tabulations, including comparable breakouts by age and initial family income for all workers.

By contrast, young minimum wage workers, especially those in better-off families, show significant earnings gains. Young workers from richer families rise from earning the least in the 1990s to the most by 2021.[13] There are permanent gaps based upon initial family income, but the age dynamic is the more striking feature. In many cases, the workers earning minimum wages during their youth will have accumulated additional education that contributed to their subsequent earnings. Quite interesting, we do not see large differences in long-run outcomes for those earning the minimum wage at ages 15-22 vs. 23-29, even among poor families. The main difference comes with the 30-49 year old group.[14]

Panel A of Table 2 provides for each minimum wage group the average LEHD earnings percentile during 1999-2021, and Panel B documents the average peak value achieved during the career. The mean peak value achieved for the minimum wage group is the 60.2 percentile. For context, the peak points are 61.5 and 74.7 for workers initially earning $5.51-$7.00 and more than $7.00 in 1994-1998. Thus, the minimum wage group on this metric also shows little gap to those initially paid $5.51-$7.00.

The columns of Table 2 continue by showing heterogeneity by race and sex (e.g., Neumark and Kala 2024). Within age-income groups, white and male workers who earned the minimum wage during the 1990s tend to have stronger future outcomes than peer minorities and females. Differences by sex are stronger than those by race. That said, differences on these two dimensions are smaller compared to the dimensions of age and initial family income that we emphasize with our primary groupings.

3.3 Additional Long-Run Analyses

Table 3 reports the cumulative career profiles across the LEHD for individuals in our 1994-1998 cohort. The minimum wage group averages $770,000 in LEHD earnings for 1999-2021, typically working 3.35 quarters per year. While Figure 4 documented the convergence of the minimum wage group with the $5.51-$7.00 group by the 2010s, over the whole period the $5.51-$7.00 group earns 6.2% more than the minimum wage group, while averaging 2.2% more quarters worked per year. Looking at heterogeneity among minimum wage workers in Panel B, young

[13] The public SIPP files confirm that the initial gaps in earnings for younger workers during 1994-1998 compared to older workers (i.e., the starting levels differences in Panels B and D of Figure 4) are fully accounted for by fewer hours and weeks worked, which is to be expected as they are all earning minimum wages.

[14] Appendix Figure 3 incorporates for each of the four age and family income groups the comparable career outcomes for those workers initially earning $5.51-$7.00 (and also $7.01+) during the 1990s. For young-richer individuals, there is no long-run earnings difference evident. The young-poor groups also track closely.

minimum wage workers from richer families earned 33% more in cumulative earnings by 2021 than those of similar age from poor families. The younger richer group also earned 89% more than the older poorer adults who were also earning minimum wages during 1994-1998.

Figure 5 provides an extended view on employment rates that covers all states. While we only observe earnings for approved states, we have access to two national datasets. The National Employment Indicators File for the LEHD documents whether someone is recorded working in the LEHD anywhere in the country (including states we do not directly observe). Likewise, the Integrated Longitudinal Business Database (ILBD) records annually whether an individual has self-employment income (e.g., Schedule C income).

We combine these measures, calculating for individuals the count of distinct years where there is evidence of them working in either the LEHD or ILBD. We can do this for all individuals in the SIPP that have a known PIK identifier. This measure is not influenced by cross-state mobility nor state coverage. Figure 5 shows that this metric behaves quite similarly to the quarters of work variable in Table 1, which is a good indication of the core LEHD sample being representative. The minimum wage group is present nationally in the administrative data 69.2% of years on average. The \$5.51-\$7.00 group is present in 72.5% of years, or a 4.7% relative differential. Appendix Table 6 provides additional tabulations.

3.4 Comparison to 2005-2009 Cohort

Figure 6 shows a remarkable consistency between the 1994-1998 and 2005-2009 minimum wage cohorts. For visual display, we center the two cohorts so that the grey area represents the five-year period of SIPP observation for both groups. Grouped years forward and backwards are mostly in three-year increments.[15]

The two cohort series have the same levels, and their common points of evolution are closely aligned. For older minimum wage workers, the time when they are observed earning minimum wages in the SIPP is linked to a modest downward dip in terms of their overall career trajectory in the LEHD. For younger workers, we treat with caution the earliest observations as a large part of the cohort is not yet in the labor market. Nevertheless, the trend is flat coming into

[15] To harmonize the two cohorts around their respective years in which we first observe them, we use t-indexed years. The 1994-1998 follows t = -1 ∼1991, t = 0 ∼1994, t = 1 ∼1997, t = 2 ∼2000, t = 3 ∼2003, t = 4 ∼2007, t = 5 ∼2011, t = 6 ∼2015, and t = 7 ∼2020. The 2005-2009 cohort follows t = -4 ∼1992, t = -3 ∼1996, t = -2 ∼1999, t = -1 ∼2002, t = 0 ∼2005, t = 1 ∼2008, t = 2 ∼2011, t = 3 ∼2014, t = 4 ∼2017, and t = 5 ∼2020.

the point of SIPP observation, after which the upward rise is substantial.[16]

3.5 Combined Analysis with All Panels

Building upon the 1994-1998 and 2005-2009 cohorts, we turn now to our full sample that combines the 1993, 1996, 2001, 2004, 2008, and 2014 SIPPs to provide coverage of minimum wage workers spanning 1992 to 2016. For the longer time span, we define minimum wage workers inclusive of state minimum wage policies, as noted in Section 2. We separate poor and richer families at the 40th percentile of the SIPP family income distribution for the year.

Figure 7 first shows that the composition of minimum wage workers is relatively stable over the SIPP panels. There is some decline in the share of the youngest workers among the minimum wage sample, but they continue to comprise more than half the sample in the 2014 SIPP. Appendix Figure 5 also confirms that the full sample looks similar to Figure 2 when considering the likelihood by age and family income level that a worker is earning minimum wages.

Table 4 provides descriptive traits spanning all of the public SIPP panels. White workers represent 81% of all minimum wage workers, with the share of minorities higher among minimum wage workers from poor families. Female workers are the majority of minimum wage workers, and immigrants are disproportionately represented. Both females and immigrants are higher shares of older minimum wage workers. Somewhat by definition, the poor families that have minimum wage workers are less likely to own their home and are more likely to receive welfare. Most minimum wage workers have a high school education or less at the time they are observed earning minimum wages. These shares are higher for those from poor families, with two-thirds of minimum wage workers aged 30-49 from poor families having not attended college.

Figure 8 provides t-indexed career profiles for all minimum wage workers observed in the six SIPP panels. Panel A considers average inflation-adjusted earnings, Panel B the average quarters worked conditional on being in the LEHD in a given year, Panel C the state-indexed earnings percentiles, and Panel D the share of the cohort earning at or below the 25th percentile of the state earning distribution.[17]

[16] Even and Macpherson (2003) also observe stability of short-run growth patterns. Appendix Table 7 provides career earnings tabulation for the 2005-2009 cohort.

[17] Appendix Tables 8a-8e tabulate values, standard errors, and sample counts for Figure 8. The 25th percentile benchmark is commonly used in social mobility studies. See, for example, Chetty et al. (2014, 2018) and Handy

We plot the data by six periods, spanning from $[t-7, t-5]$ to $[t+8, t+10]$. As our minimum wage workers have focal t years from 1992 to 2016, the three time periods $[t-1, t+1]$, $[t+2, t+4]$, and $[t+5, t+7]$ have complete data coverage. The starting and ending periods of $[t-7, t-5]$, $[t-4, t-2]$, and $[t+8, t+10]$ contain a subset of SIPP panels based upon the SIPP timing relative to LEHD (e.g., the 2014 panel is not included in the $[t+8, t+10]$ values). Caution should also be used for interpreting values for young workers in pre-periods as those who are engaged in work are a subset of the full cohort.

The patterns confirm our earlier results with the longer panels. All groups maintain participation levels above 80% through $[t+5, t+7]$, with the exception of older-poor minimum wage workers (71%). By then, there is limited variance in quarters worked, and the earnings of the youngest have caught up to their older-poor peers (but still lag those of the older-richer workers, as in the long-run analyses at the same point in time). The rapid upward trajectories of the youngest minimum wage workers continues to $[t+8, t+10]$ period. For older workers on the minimum wage, the focal period is a dip from earlier and future values.

4 Empirical Results - Policy Changes

4.1 State Heterogeneity in Long-Run Panel

To consider the impact of policy changes, we first use state heterogeneity in the long-run panel. Figure 1 showed the evolution of the federal minimum wage and states that have higher minimum wages within our sample. During the 1990s, the federal rate was the binding policy in virtually all states. In 1992 and 1993, no state had a minimum rate higher than the federal rate of $4.25. Washington set a higher rate in 1994 of $4.90, with a couple of very minor increases also occurring in places like Delaware (1996, $4.56) and California (1997, $5.01), as the federal rate grew to $4.38 in 1996 and $4.88 in 1997. With the federal increase to $5.15 in 1998, there is again another remarkable point of convergence—all states at or very near the federal rate again except for California that also in 1998 increased its minimum wage to $5.65.

From 1999 onwards, however, there is remarkable divergence. The federal rate stays at $5.15 until 2007. Six of our 22 states—California, Connecticut, Delaware, Maine, Washington, and Wisconsin—set state minimum wages that exceed the federal rate by at least $1.00 by 2006, ranging from $6.15 in Delaware to $7.63 in Washington. The other 15 states mostly

and Shester (2022).

remain at $5.15. While there is another wave of convergence and divergence after 2007, we use these six states to establish a time-consistent group representative of those pursuing stronger state minimum wage policies. As a whole, the six states averaged state minimum wages 22.7% higher than the federal rate during 1999-2022, whereas the other 15 states averaged 5.3% higher.

We examine whether the future careers of the minimum wage workers look different in the states that aggressively raise their state minimums. The picture reflected in Figure 9 is nuanced. Minimum wage workers initially in the six focal states experienced higher subsequent earnings than peers in the other 15 states, but that is mostly a state-level earnings phenomenon that applied to all workers in these states. In the lower panel, the relative income positions of minimum wages workers in the future are not different by state group.[18]

The recent minimum wage literature is mixed on the degree to which minimum wage increases spillover into higher parts of the income distribution.[19] One interpretation of Figure 9 is that states with higher incomes (and cost of living) like Connecticut and Washington can set higher state minimum wages but not have them affect local career trajectories in a relative sense. It might also be true that spillovers from higher state minimum wages push up the overall earnings distribution. Our mapping of careers from the 1990s cannot resolve this question, but our evidence on the parallel and flat movements of the older poor workers on the minimum wage across the two state groups does suggest the policy is not greatly reshaping their relative career profiles.

4.2 Short- and Medium-Run Impact of State Minimum Wage Increases

Our final analysis measures whether state minimum wage increases link to changes in short- and medium-run earnings and quarters worked in the LEHD for workers earning minimum wages at time of the policy change. We utilize the dataset with all six SIPP panels for this analysis.

We restrict the sample to individuals aged 23-49 years old in year t, thus dropping teenagers and the youngest adults. We also require included individuals have an identified SIPP wage, have LEHD earnings in $t-1$ and t, and be in a SIPP state with full LEHD records that

[18] Appendix Figure 6 adds into these graphs the future outcomes for those higher earners in the 1990s.

[19] See, for example, DiNardo et al. (1996), Lee (1999), Neumark et al. (2004), Autor et al. (2016), Cengiz et al. (2019), Gopalan et al. (2020), and Vogel (2025).

commence by year $t-1$. The total sample is 54,500 observations, of which slightly more than 10% are earning minimum wages in year t.

Regressions take the form for person i, state s, and focal year t:

$$\begin{aligned} Y_{i,t-1\rightarrow t+x} &= \beta_1(0/1)\text{MW-Earner}_{i,t} \\ &\quad +\beta_2(0/1)\text{MW-Earner}_{i,t}\cdot\text{MW-Change}_{s,t-1\rightarrow t+x} \\ &\quad +\gamma X_{i,t}+\eta_{s,t}+\epsilon_{i,t\rightarrow t+x}. \end{aligned} \tag{1}$$

The outcome variables $Y_{i,t\rightarrow t+x}$ model cumulative work history in the LEHD from period $t-1$ to $t+1$, $t+4$, and $t+7$, respectively. To illustrate, a time span of 2004-2009 is used for $t-1\rightarrow t+4$ when $t=2005$. We aggregate the cumulative LEHD earnings and quarters worked over years and transform to log values.

The first explanatory variable is $(0/1)\text{MW-Earner}_{i,t}$, an indicator for an individual having earned minimum wages in period t. This metric does not vary for an individual as we lengthen the time horizon of study, always being fixed at its value in focal year t.

The second metric, and our primary interest, is the interaction of $(0/1)\text{MW-Earner}_{i,t}$ with $\text{MW-Change}_{s,t-1\rightarrow t+x}$. The latter metric measures the change in the minimum wage for the SIPP state s (inclusive of federal rates) from period $t-1$ to the end of the indicated period. For example, it measures the change from 2004 to 2009 for a focal SIPP year of 2005 in the $t+4$ analysis. We consider nominal changes (e.g., an increase of 40 cents) and relative changes (e.g., an 8% increase if the increase of 40 cents was on an initial value of \$5.00).

The $X_{i,t}$ vector of controls includes the individual's LEHD earnings in $t-1$ and the age, education, race, sex, and family income status of an individual in year t as measured by the SIPP. A vector of $\eta_{s,t}$ of state-year fixed effects control for the main effects of $\text{MW-Change}_{s,t-1\rightarrow t+x}$. The β_2 coefficient thus measures whether workers who earned minimum wages at the time of state-level increases show greater growth in future earnings or quarters worked compared to others not experiencing increases, after partially out individual traits and the aggregate movements of state earnings as captured in the non-minimum wages workers from focal year t.

Panel A of Table 5 reports the models using nominal changes, and Panel B considers relative changes. The first analysis of $[t-1,t+1]$ shows minimum wage workers have higher short-run earnings in states with policy increases. The relative model in Panel B is precisely

estimated with a t-stat of 2.06. It measures a 10% relative increase in state minimum wages, from $t-1$ to $t+1$, links to a 4.3% increase in cumulative earnings over the period. The smaller earnings effect relative to the policy change will combine partial period implementation with other economic factors like potential job loss or reduction in hours (Jardim et al., 2022). While we do not observe hours for workers, there is directional evidence of fewer quarters worked in Column 4.

Looking out to the seven-year horizon, which would further incorporate additional policy changes should they occur, we do not see evidence of medium-run shifts in worker career profiles. A 10% relative increase in state minimum wages over this horizon links to an imprecisely estimated 0.8% higher earnings profile.

These findings are quite robust. We have considered alternative empirical designs that allow more cross-state variation and samples that focus just on workers in the bottom half of the SIPP wage distribution. We have also tested other covariate and worker matching strategies. We tested empirical approaches that model large changes in state policies, ultimately focusing on continuous metrics for disclosure. We do not find evidence that state minimum wage increases altered career earnings at a seven-year horizon.

Additionally, an analysis of LEHD earnings in prior years, $[t-4, t-1]$, further confirms the earnings increase is localized on the state policy change $[t-1, t+1]$ for the minimum wage workers in period t. Using the same explanatory variables as Column 1, we model the outcome variable of log LEHD earnings during $[t-4, t-1]$. An individual's minimum wage status in t and the policy changes during $[t-1, t+1]$ do not predict higher earnings during $[t-4, t-1]$. For Panel A's format using nominal policy changes, the coefficient is 0.013 (0.056); the coefficient is 0.076 (0.307) for Panel B's relative changes. This lack of pre-period impact complements the decay of earnings premiums to longer time horizons.

5 Discussion

This paper has analyzed the careers of minimum wage workers. Most minimum wage workers over the last three decades have been young adults, and the careers of these workers quickly move them up the earnings distribution. By mid-life, their earnings profiles and work patterns closely resemble those who were initially earning a couple of dollars per hour more than them. This is true even for young adults aged 23-29 living in poor families. Older workers earning

minimum wages show a modest dip in earnings at that moment compared to earlier and later periods. The typical career prospects of these older workers, in absolute and relative terms, will also be better going forward, if only modestly so.

What do these patterns say about the structure of the job market? And what do we gain by seeing these long-term profiles compared to the short panels captured in household surveys?

Labor economics has long considered the distinction between "good jobs" and "bad jobs." Dual labor market theory posits a segmented labor market where a primary sector of stable, upwardly mobile jobs coexists with a secondary sector characterized by low wages, high turnover, and limited advancement (Doeringer and Piore, 1971; Dickens and Lang, 1985). By contrast, the human capital model conceptualizes a unified labor market in which wage differentials and mobility reflect differences in individual skills, education, and on-the-job learning, implying that workers naturally rise in the earnings distribution as they accumulate experience. The human capital framework can also yield stagnating careers if workers are not accumulating productive skills over time (Becker, 1964; Ben-Porath, 1967). Both perspectives have long shaped views on wage growth and employment trajectories, with recent research considering career stagnation and segmentation through the lens of technological change, globalization, and contingent work (e.g., Autor et al., 2013; Hershbein and Kahn, 2018; Katz and Krueger, 2019; Dworczak et al., 2021).[20]

Within these two conceptual models, the patterns documented in our work are likely, as a whole, more closely connected to the unified labor market model. This certainly the case for young workers earning minimum wages, who show promising career growth over the following two decades. This would not have been evident immediately after the minimum wage spell, and even five years later these workers are still typically only at the 25th percentile or thereabouts of the earnings distribution. But, long-term, they will peak at the 60th percentile or higher. The convergence of their careers with those earning initially higher wages suggest that the minimum wage jobs held by youth, which are the majority of minimum wage jobs, are best characterized as a launching pad integrated with the full labor market.

[20] These discussions are not confined to academia. In 2023, McDonald's launched its "1-in-8" campaign around the theme that one in eight US adults have worked at McDonald's. Its website (https://mcdonalds1in8.com/) celebrates skills learned at McDonalds and provides examples of past workers. Previously, in 2005, McDonald's also launched the "My First Jobs" campaign to celebrate famous individuals who began their career as a member of the "Crew." The organization thus positions its jobs, which have often paid at or near minimum wages, as part of many careers and no cap on upward mobility.

The results for older minimum wage workers could be consistent with either model, but perhaps again lean towards the unified labor market view. Older minimum wage workers typically show better future careers after their minimum wage spell, rebounding to prior levels evident in their own past earnings histories. While their careers are more subdued than those of young workers, they will typically move five percentiles or more up the earnings distribution in the next five years. They also achieve peak values at or near the midpoint of the earnings distribution. As these workers are often employed at the same minimum wage businesses as young workers, the simpler human capital model with stagnant skills seems the most straightforward explanation.[21]

Given the stability of the patterns when examining cohorts throughout the 1990s to 2010s, our results are useful for forward projections. The composition of minimum wage workers is becoming older. In the 2022 Current Population Survey, 15-22 year olds account for 45% of the minimum wage workers aged 15-49, down from 58% in the 1993 SIPP. Across these periods, 23-29 and 30-49 year olds grew 16%→24% and 26%→30%, respectively. This older age profile suggests today's minimum wage workers will experience somewhat less career earnings growth as a cohort compared to earlier decades. Perhaps offsetting this, they appear to be increasingly from higher income households, although this demarcation is more ambiguous across long time horizons.

Our analysis also suggests that increasing state-level minimum wages, at least within the range of policy increases observed during the study's time period, has limited impact for the future careers of workers currently earning the minimum wage. There is no question that minimum wage workers in states that adopt aggressive minimum wage policies—such as California, Washington, and Connecticut—earn more than their peers elsewhere and have stronger future earnings. This appears mostly a state-wide earnings outcome, however, as the careers of the minimum wage workers are rising in tandem with the overall wage structure, rather than experiencing disproportionate gains. This pattern is consistent with the interpretation that states with stronger labor markets and faster wage growth are better positioned—politically and economically—to implement higher wage floors, rather than minimum wage increases themselves serving as the primary catalyst for broader income growth. This literature front is quite active (e.g., Autor et al., 2016; Cengiz et al., 2019; Vogel, 2025), however, and we do analyze

[21] High rates of upward mobility out of minimum wage jobs would not preclude monopsony power from occurring, but it may place some limits on its extent.

potential upward spillovers with these career assessments. The simpler conclusion from our work is that the long-run earnings mobility for minimum wage workers is more closely aligned with individual and regional characteristics than with contemporaneous minimum wage increases. And, importantly, an increase in the state minimum wage does not disproportionately lead some minimum wage workers to escape from a poverty trap that has otherwise stifled career advancement.

These outcomes represent only one part of the factors to be considered in optimal policy design. The minimum wage appears an important floor for the labor market, and there is evidence of a decline from prior earnings for older workers who are earning the minimum wage. The strength of minimum wages also undergirds the overall bargaining power of labor (Stansbury and Summers, 2020) and closes racial income gaps (Derenoncourt and Montialoux, 2021). In this context, our work suggests that the composition of the minimum wage workforce and the transient nature of minimum wage episodes make it challenging to lift the relative earnings of the working poor through increases in minimum wages.

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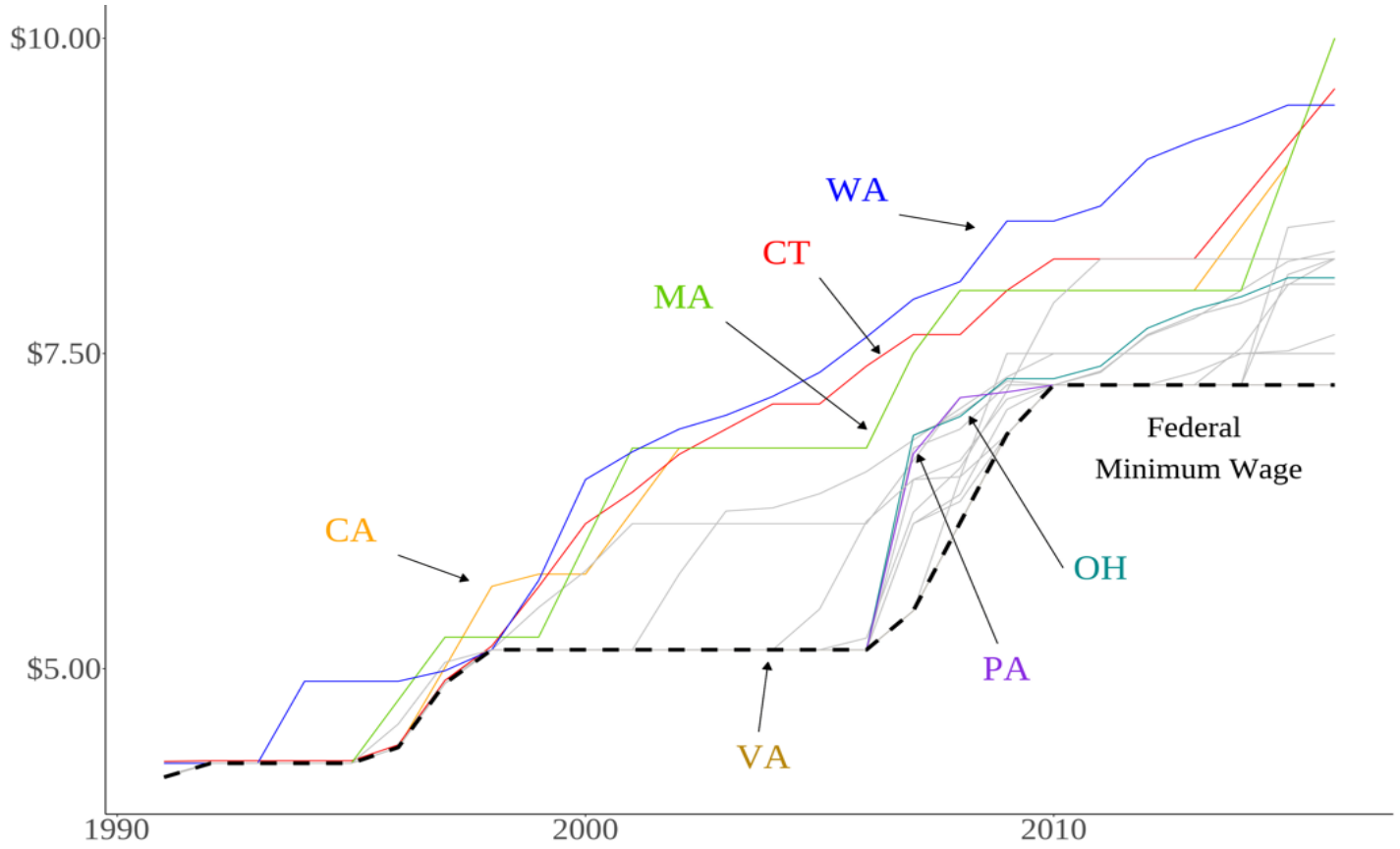
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Figures and Tables

F1 Federal and state minimum wages, 1991-2016
F2 Share of workers earning at or near minimum wages by age and family income level, 1994-1998
F3 Distribution and percentile comparisons of combined SIPP panels, 1992-2016
F4 Long-run career trajectories of workers earning minimum wages in 1994-1998
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F7 Composition of minimum wage workforce over public SIPP panels, 1992-2016
F8 Career trajectories for minimum wage workers 1992-2016 indexed to year when individuals are observed
F9 Long-run career trajectories by state policy environment

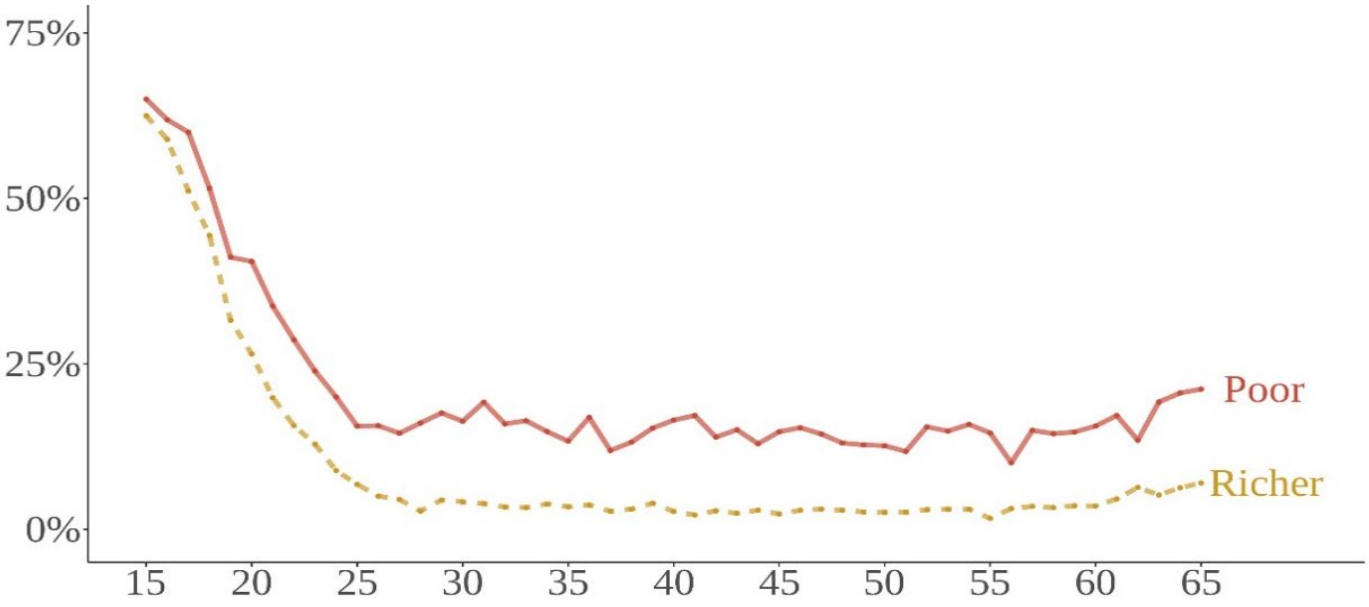
T1 Career trajectories in 1999-2021 LEHD for individuals earning minimum wages in 1994-1998 SIPP
T2 Career heterogeneity by race and sex for individuals earning minimum wages in 1994-1998 SIPP
T3 LEHD cumulative earnings for 1994-1998 sample
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Figure 1: Federal and state minimum wages, 1991-2016



Notes: Figure reports federal and state minimum wage levels during the core sample period for states included in the LEHD sample. Appendix Figure 1 extends to 1980-2022.

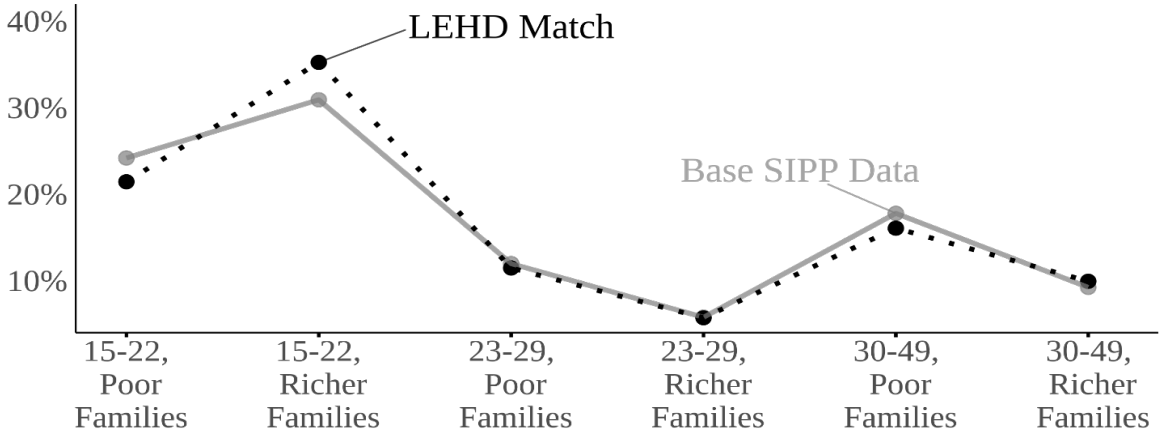
Figure 2: Share of workers earning at or near minimum wages by age and family income level, 1994-1998



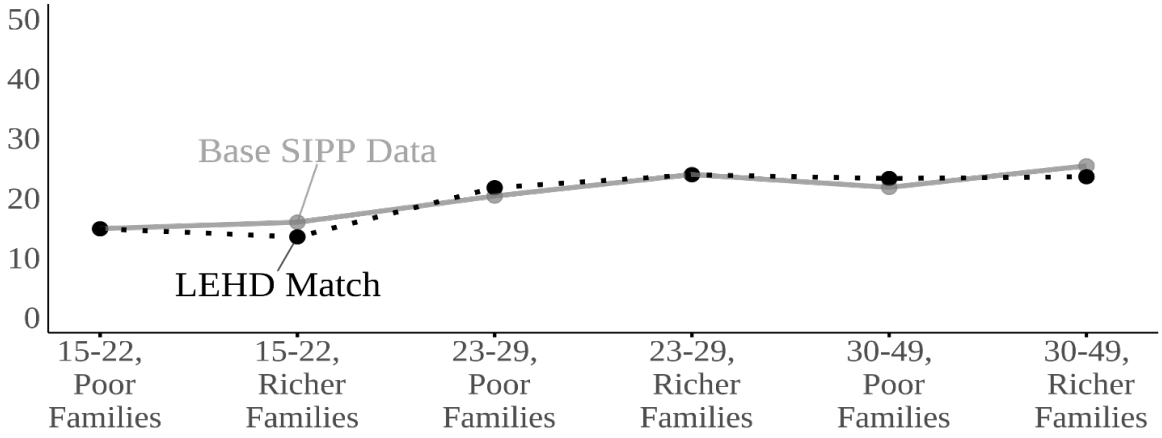
Notes: Figure reports share of workers by age and family income levels during the 1994-98 period earning at or near minimum wages.

Figure 3: Distribution and percentile comparisons of combined SIPP panels, 1992-2016

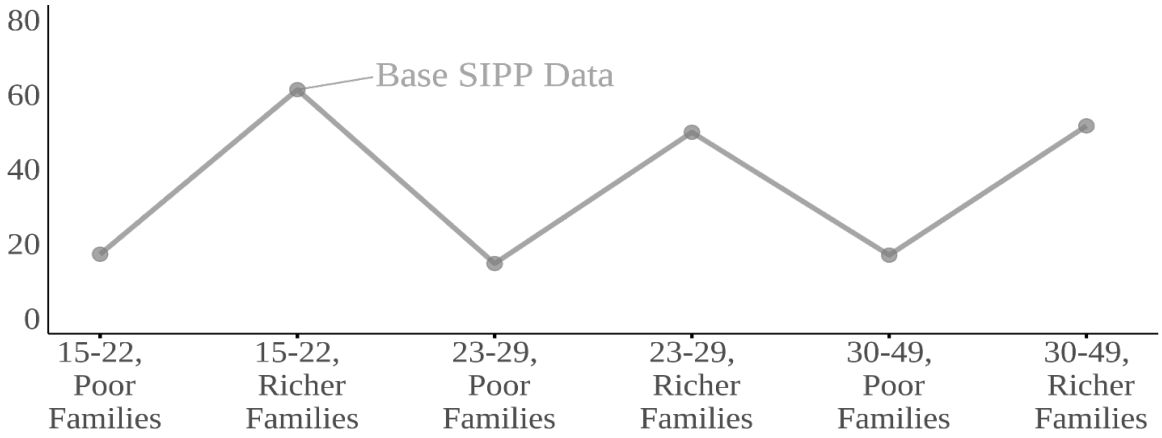
A. Shares of minimum wage workers by age and family income level



B. Average percentiles of minimum wage workers in SIPP and LEHD earnings distributions

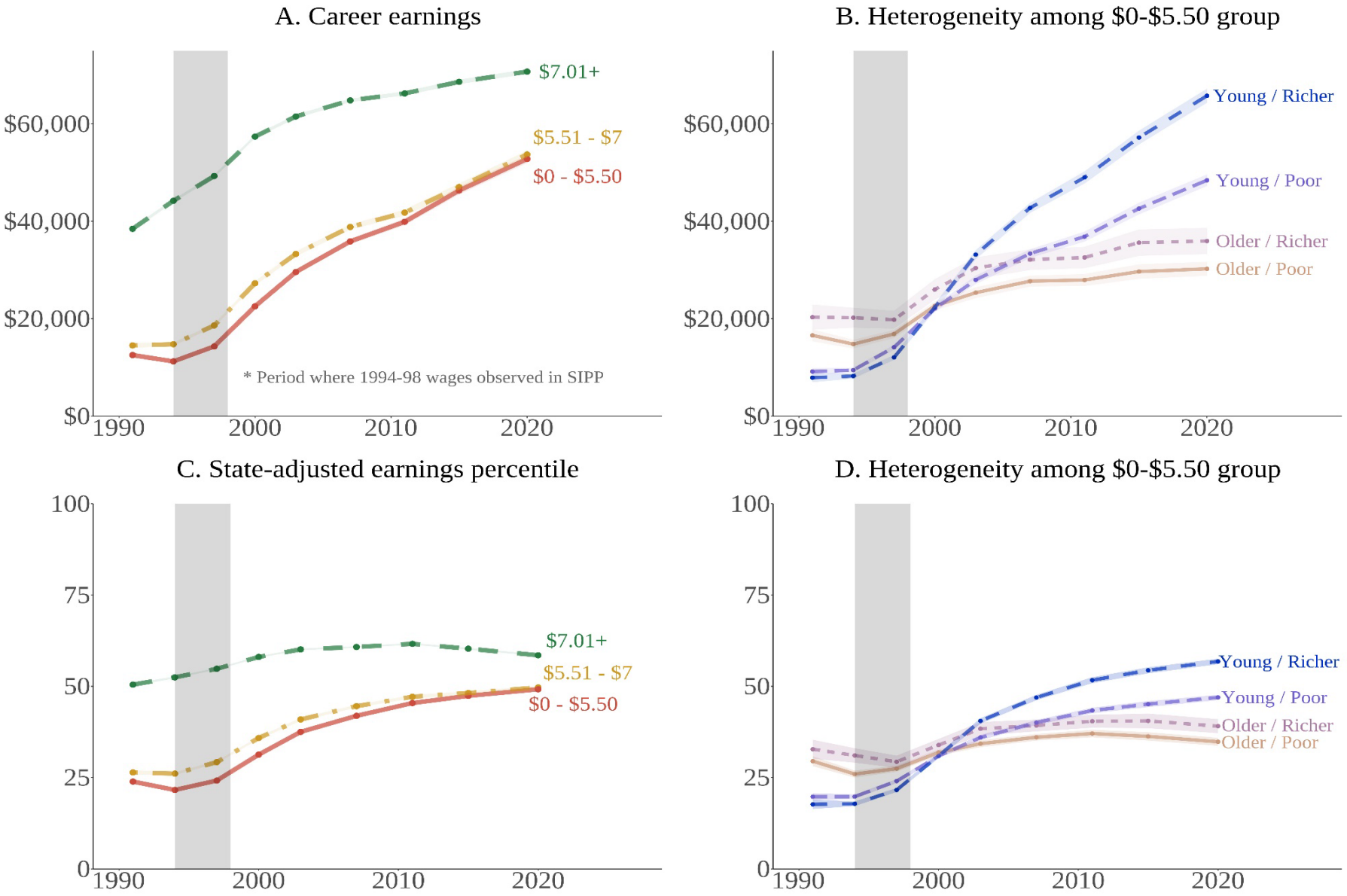


C. Average family income percentiles of minimum wage workers in SIPP distribution



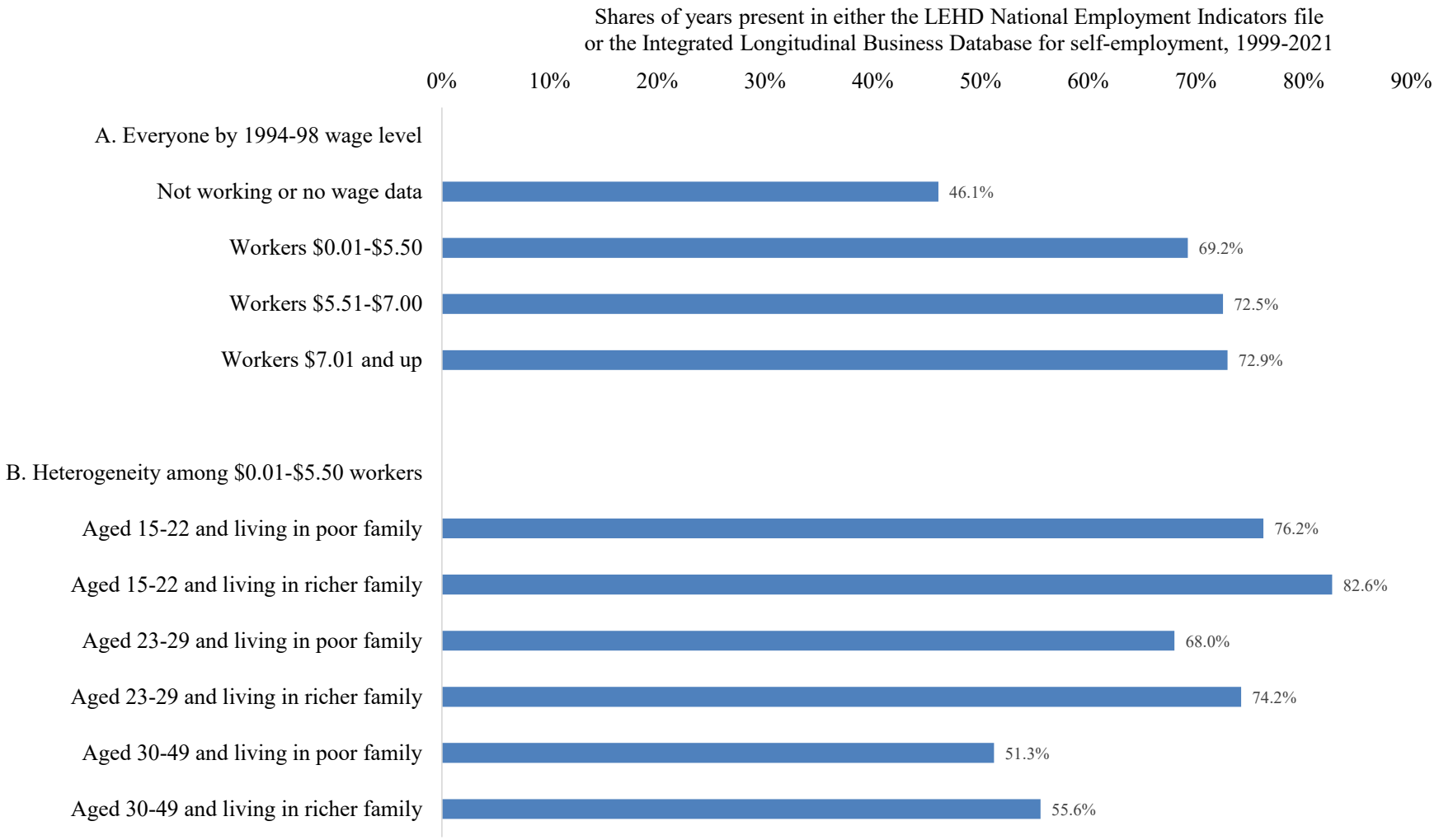
Notes: Panel A describes the composition of SIPP minimum wage workers during 1992-2016 in the public SIPP and LEHD-matched samples. Panel B compares for LEHD-matched individuals where their earnings fall in the earnings distributions of the SIPP data and LEHD data. Panel C provides the average of the family's position in the SIPP family income distribution for minimum wage workers. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520, R11627.

Figure 4: Long-run career trajectories of workers earning minimum wages in 1994-1998



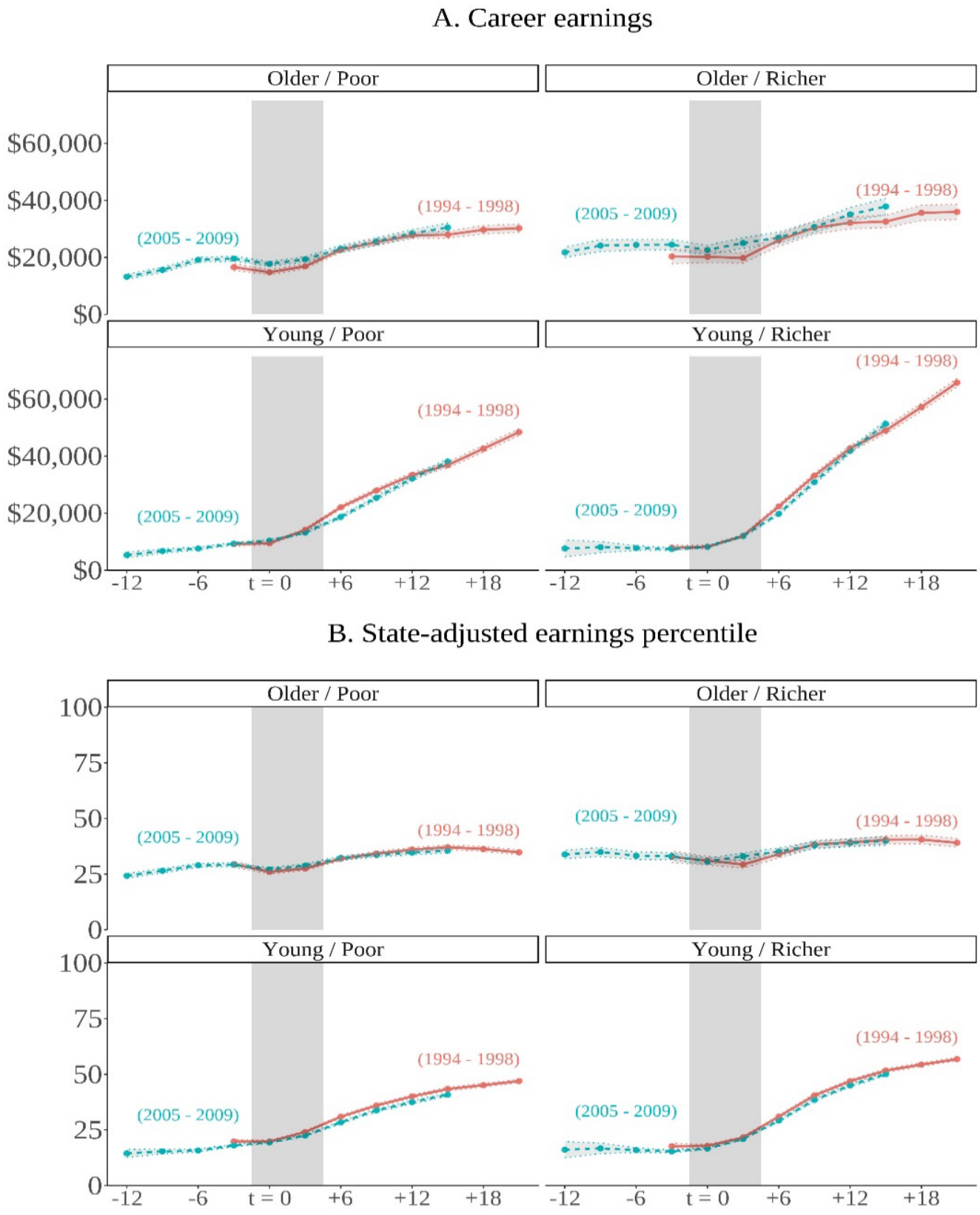
Notes: Figure reports the 1990-2021 LEHD earnings and state-indexed earnings percentiles of individuals who earned minimum wages during the 1994-1998 period as measured by the SIPP. Values for LEHD earnings are in 2021 dollars and winsorized at 5% and 95% levels per year. The left-side panels describe career profiles for those earning $0-5.50, $5.51-$7.00, and $7.01+ per hour in 1994-1998 (nominal values). The right-side panels separate the future career trajectories of workers earning $0-5.50 in 1994-1998 by age (15-29, 30-49) and family income levels (separated at $3000 per month). The 22 states present in the LEHD sample: AZ, CA, CO, CT, DE, KS, MD, ME, MO, MT, ND, NM, NV, OH, PA, SC, SD, TN, VA, WA, WI, and WY. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Figure 5: Employment rates nationally during 1999-2021 for individuals aged 15-49 in 1994-1998 SIPP



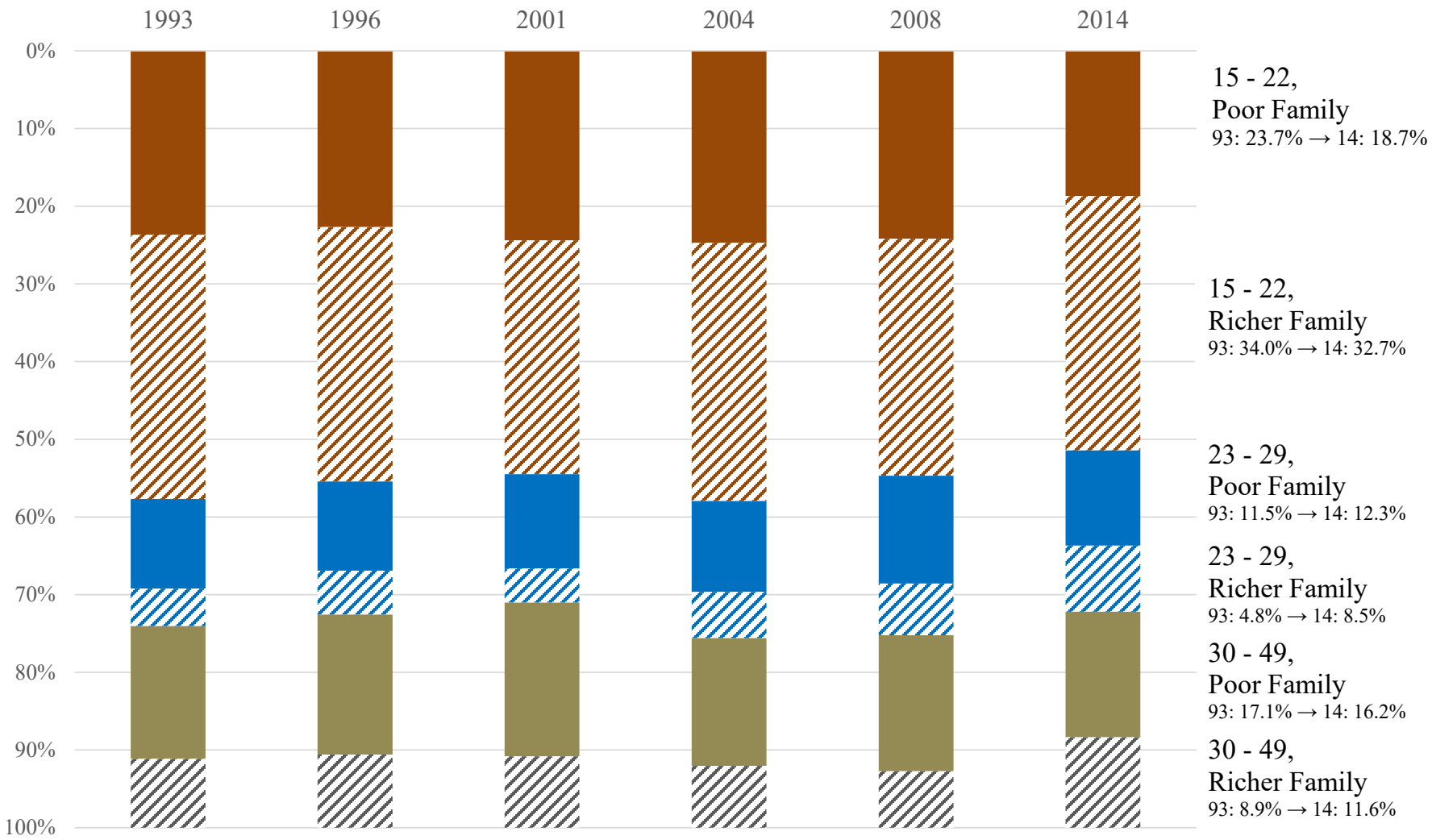
Notes: Figure displays shares of years workers are present during 1999-2021 in either the LEHD National Employment Indicators file for paid work or the Integrated Longitudinal Business Database for self-employment. This employment analysis is national in scope, covering all SIPP workers during 1994-98 in all 50 states and DC. Appendix Tables 5a-6 provide additional tabulations. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R11999.

Figure 6: Comparison of 1994-1998 and 2005-2009 cohorts



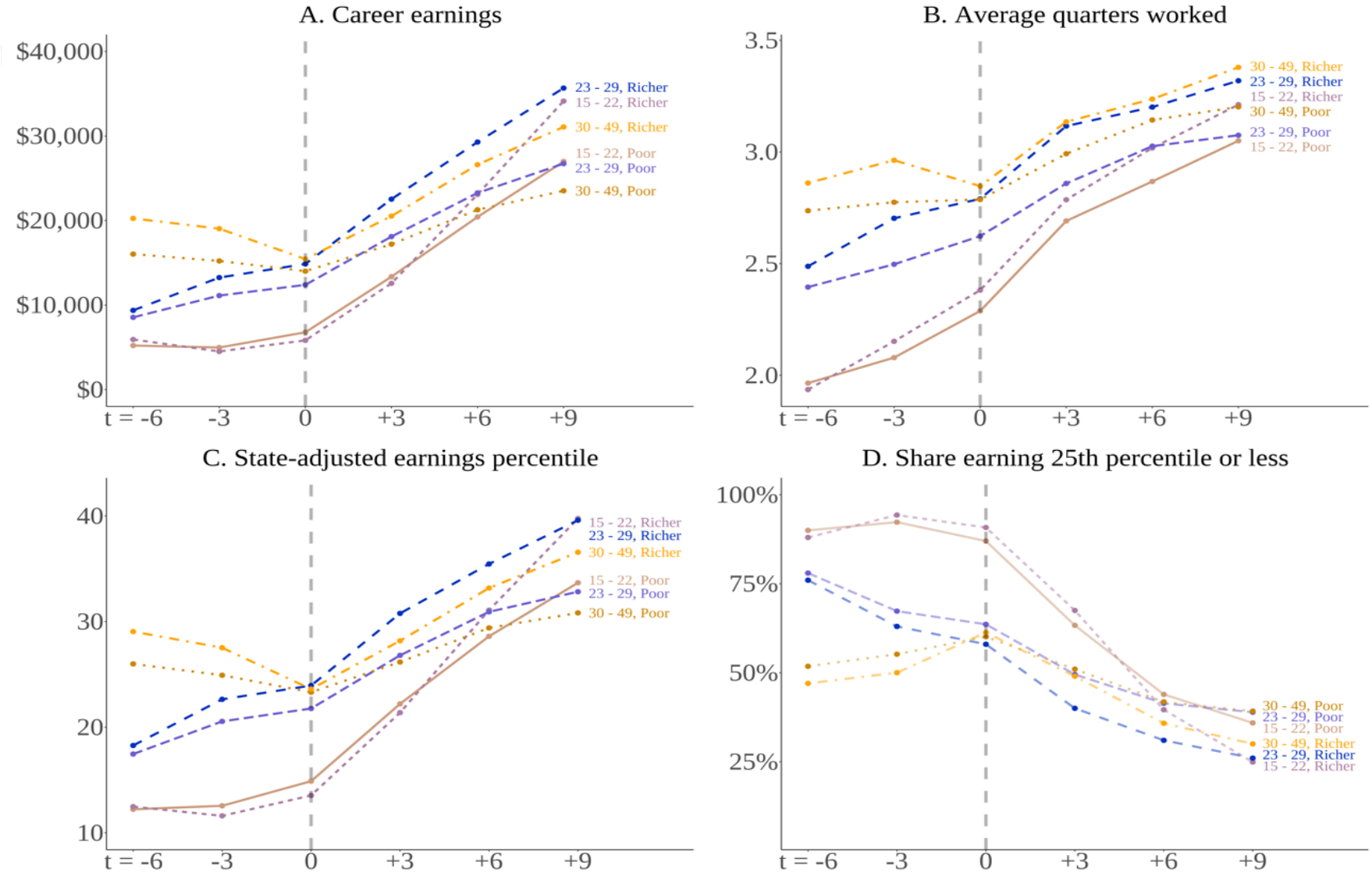
Notes: See Figure 4. Figure compares career trajectories of workers earning minimum wages in 1994-1998 to workers earning minimum wages during 2005-2009. Both cohorts are centered so that the grey area represents their observation period in the SIPP. Future and past years are grouped into three-year periods {..., [-4,-2], [-1,+1], [+2,+4], [+5,+7], ...} with markers labeled at midpoints (+6 designates [t+5, t+7]). Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520, R11627.

Figure 7: Composition of minimum wage workforce over public SIPP panels, 1992-2016



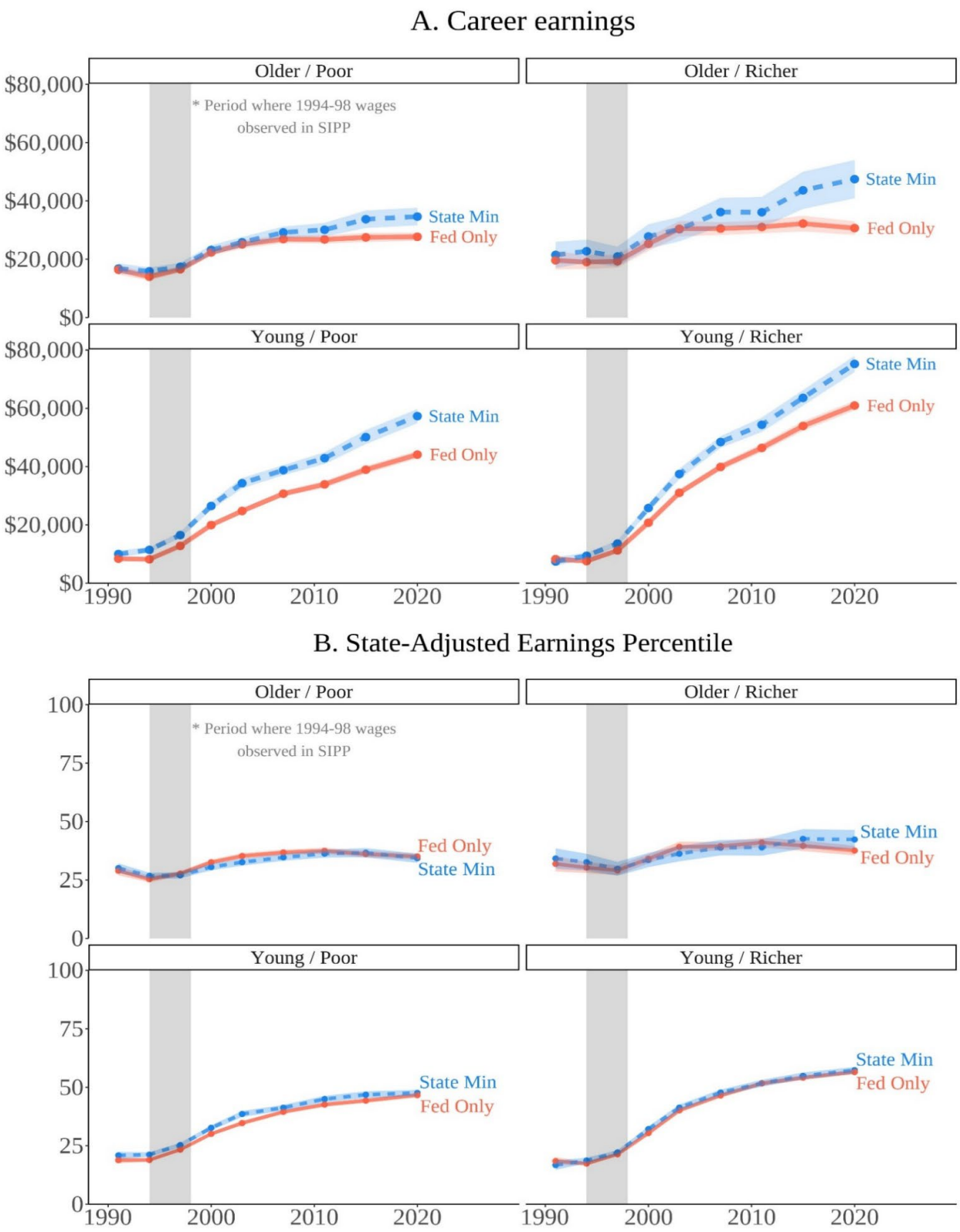
Notes: Figure displays the composition of workers earning at or near to minimum wages during 1992-2016 by SIPP panel, combining federal and state minimum wage policies. The division between poor and richer families is set at the 40th percentile of family incomes.

Figure 8: Career trajectories for minimum wage workers 1992-2016 indexed to year when individuals are observed



Notes: Figure displays t-indexed LEHD career profiles for individuals earning minimum wages when measured by the SIPP, combining federal and state minimum wage policies. The dataset combines LEHD records from 1992-2021 and SIPP records from 1992-2016 using the 1993, 1996, 2001, 2004, 2008, and 2014 panels (all waves). SIPP individuals are timed to a primary year t that is the mid-point of their multi-year SIPP records, taking the earlier year in the case of even-numbered year spans (e.g., 2000 if an individual is observed 1999-2002 in SIPP). Included individuals are aged 15-49 years old in year t, have an identified SIPP wage, have LEHD earnings in t-1 and t, and are in a SIPP state with full LEHD records that commence by year t. Each observation represents the average of a three-year period centered on the indicated t-indexed year (e.g., +3 represents the period [t+2, t+4]). The three time periods [t-1,t+1], [t+2,t+4], and [t+5,t+7] have complete data coverage. The starting and ending periods of [t-7,t-5], [t-4,t-2], and [t+8,t+10] contain a subset of SIPP panels based upon the SIPP timing relative to LEHD. Appendix Tables 8a-8e record values, standard errors, and sample counts. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Figure 9: Long-run career trajectories by state policy environment



Notes: See Figure 4. With the federal minimum wage increase to $5.15 in 1998, all states are at the federal rate except for California (which increased its minimum wage to $5.65 in 1998). This figure splits the 22 LEHD states into six states (California, Connecticut, Delaware, Maine, Washington, and Wisconsin, labeled "State Min") that will set state minimum wages that exceed the federal minimum wage by at least $1.00 by 2006 vs. 15 states that do not (labeled "Fed Only"). Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Table 1: Career trajectories in 1999-2021 LEHD for individuals earning minimum wages in 1994-1998 SIPP

	Average quarters employed in LEHD			Average real earnings of individuals observed in LEHD (winsorized at 5/95th percentiles by year, 2021$)			Average percentile of individuals indexed to LEHD earnings distribution of state		
	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Aggregate behavior by starting wage level in 1994-1998									
Not working or no wage (n=3700)	2.522 (0.013)	3.112 (0.007)	3.444 (0.006)	$19,500 (278.4)	$33,000 (213.8)	$49,000 (283.9)	27.36	38.33	47.84
Workers $0.01-$5.50 (n=4000)	2.709 (0.010)	3.211 (0.006)	3.492 (0.006)	$13,500 (137.4)	$29,500 (158.6)	$46,500 (234.6)	23.26	37.10	47.39
Workers $5.51-$7.00 (n=4400)	2.911 (0.009)	3.325 (0.006)	3.524 (0.005)	$17,500 (128.4)	$33,500 (146.5)	$47,500 (214.3)	28.15	40.63	48.36
Workers $7.01 and up (n=18,000)	3.439 (0.004)	3.593 (0.002)	3.632 (0.002)	$47,500 (119.2)	$61,500 (103.2)	$68,500 (131.4)	53.98	59.67	60.15
B. Heterogeneity in sample earning $0.01-$5.50 during 1994-1998									
Young (aged 15-29) living in poor family (n=1600)	2.564 (0.016)	3.083 (0.010)	3.418 (0.009)	$12,500 (200)	$28,000 (240.6)	$43,000 (332.4)	22.48	35.73	45.16
Young (aged 15-29) living in richer family (n=1400)	2.622 (0.017)	3.233 (0.010)	3.553 (0.008)	$11,000 (201.6)	$33,500 (278.6)	$57,500 (407.8)	20.47	39.83	54.33
Older (aged 30-49) living in poor family (n=750)	2.924 (0.023)	3.342 (0.014)	3.492 (0.015)	$16,000 (327.7)	$25,500 (306.4)	$29,000 (399.7)	26.68	34.05	36.05
Older (aged 30-49) living in richer family (n=250)	3.177 (0.037)	3.493 (0.021)	3.573 (0.022)	$19,500 (735.8)	$29,500 (634.9)	$34,500 (731.4)	29.64	37.31	40.19

Notes: Table reports values that aggregate 1999-2021 LEHD files. Dollar values are expressed in real 2021 dollars. Included individuals were present in 1993 (waves 4-9) or 1996 (waves 1-10) SIPP panel. The 1999-2008 period is the first ten years after the initial period. Panel B separates individuals who were earning minimum wages in 1994-1998 by age (15-29 vs. 30-49) and family income levels (separated at $3000 per month) when observed in the SIPP. The appendix provides additional tabulations. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Table 2: Career heterogeneity by race and sex for individuals earning minimum wages in 1994-1998 SIPP

1994-1998 Groupings:	Future earnings of minimum wage individuals indexed to state LEHD percentiles Total [n=4000]	White [n=3450]	Minorities [n=630]	Male [n=1560]	Female [n=2450]
	(1)	(2)	(3)	(4)	(5)
	A. Average earnings percentile 1999-2021				
Total	42.23 (0.100)	42.57 (0.108)	40.21 (0.251)	46.54 (0.172)	39.49 (0.119)
Young (aged 15-29) living in poor family	40.61 (0.154)	40.96 (0.171)	39.04 (0.350)	43.88 (0.257)	38.36 (0.188)
Young (aged 15-29) living in richer family	47.40 (0.170)	47.54 (0.179)	46.06 (0.519)	50.89 (0.265)	44.52 (0.215)
Older (aged 30-49) living in poor family	34.97 (0.204)	35.13 (0.226)	34.11 (0.478)	38.98 (0.442)	33.53 (0.225)
Older (aged 30-49) living in richer family	38.56 (0.373)	38.20 (0.398)	41.69 (1.031)	45.61 (1.032)	36.97 (0.387)
	B. Peak earnings percentile achieved 1999-2021				
Total	60.19 (0.087)	60.60 (0.095)	57.76 (0.219)	65.39 (0.142)	56.88 (0.107)
Young (aged 15-29) living in poor family	59.08 (0.131)	59.47 (0.146)	57.32 (0.301)	63.17 (0.212)	56.27 (0.163)
Young (aged 15-29) living in richer family	67.16 (0.134)	67.42 (0.141)	64.76 (0.417)	70.64 (0.200)	64.29 (0.176)
Older (aged 30-49) living in poor family	48.25 (0.198)	48.25 (0.219)	48.27 (0.463)	52.53 (0.433)	46.71 (0.217)
Older (aged 30-49) living in richer family	53.41 (0.353)	53.05 (0.382)	56.49 (0.804)	62.92 (0.848)	51.26 (0.376)

Notes: See Table 1. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Table 3: LEHD cumulative earnings for 1994-1998 sample

	Average quarters employed in LEHD 1999-2021	Total earnings in LEHD 1999-2021
	(1)	(2)
	A. Aggregate behavior by starting wage level in 1994-1998	
Not working or no wage	3.277	$803,000
	(0.005)	(3300)
Workers $0.01-$5.50	3.351	$770,000
	(0.004)	(2700)
Workers $5.51-$7.00	3.424	$818,000
	(0.004)	(2500)
Workers $7.01 and up	3.611	$1,298,000
	(0.002)	(1600)
	B. Heterogeneity in sample earning $0.01-$5.50 during 1994-1998	
Young (aged 15-29) living in poor family	3.252	$715,000
	(0.007)	(3900)
Young (aged 15-29) living in richer family	3.399	$952,000
	(0.006)	(4700)
Older (aged 30-49) living in poor family	3.407	$504,000
	(0.010)	(4600)
Older (aged 30-49) living in richer family	3.530	$622,000
	(0.015)	(9000)

Notes: See Table 1. Table reports cumulative LEHD employment and earnings during 1999-2021 for 1994-1998 sample. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Table 4: Traits of minimum wage workers in public SIPP panels, 1992-2016

	White	Female	Immigrant	Household owns home	Household receives welfare frequently	Education distribution			
						Not HS graduate	HS graduate	Some college	College graduate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total	81%	60%	19%	49%	27%	25%	34%	35%	5%
Aged 15-22, Poor family	78%	58%	12%	32%	34%	28%	37%	33%	2%
Aged 15-22, Richer family	84%	55%	8%	75%	13%	25%	32%	40%	3%
Aged 23-29, Poor family	79%	59%	26%	24%	33%	23%	34%	35%	9%
Aged 23-29, Richer family	84%	59%	27%	58%	25%	13%	35%	38%	14%
Aged 30-49, Poor family	78%	66%	35%	32%	38%	31%	35%	28%	6%
Aged 30-49, Richer family	82%	74%	34%	66%	23%	20%	36%	33%	11%

Notes: Table reports traits of minimum wage workers 1992-2016 at the time of the SIPP panel using public SIPP data, combining all six panels from 1993 to 2014. Immigrant shares are from the 2004, 2008, and 2014 panels. Welfare share is defined as a household receiving welfare in more than 50% of months surveyed. Education levels are at the time of the SIPP panel, potentially increasing further after the SIPP (especially for 15-22 year olds).

Table 5: LEHD analysis of earnings and employment after minimum wage increases using all SIPPs

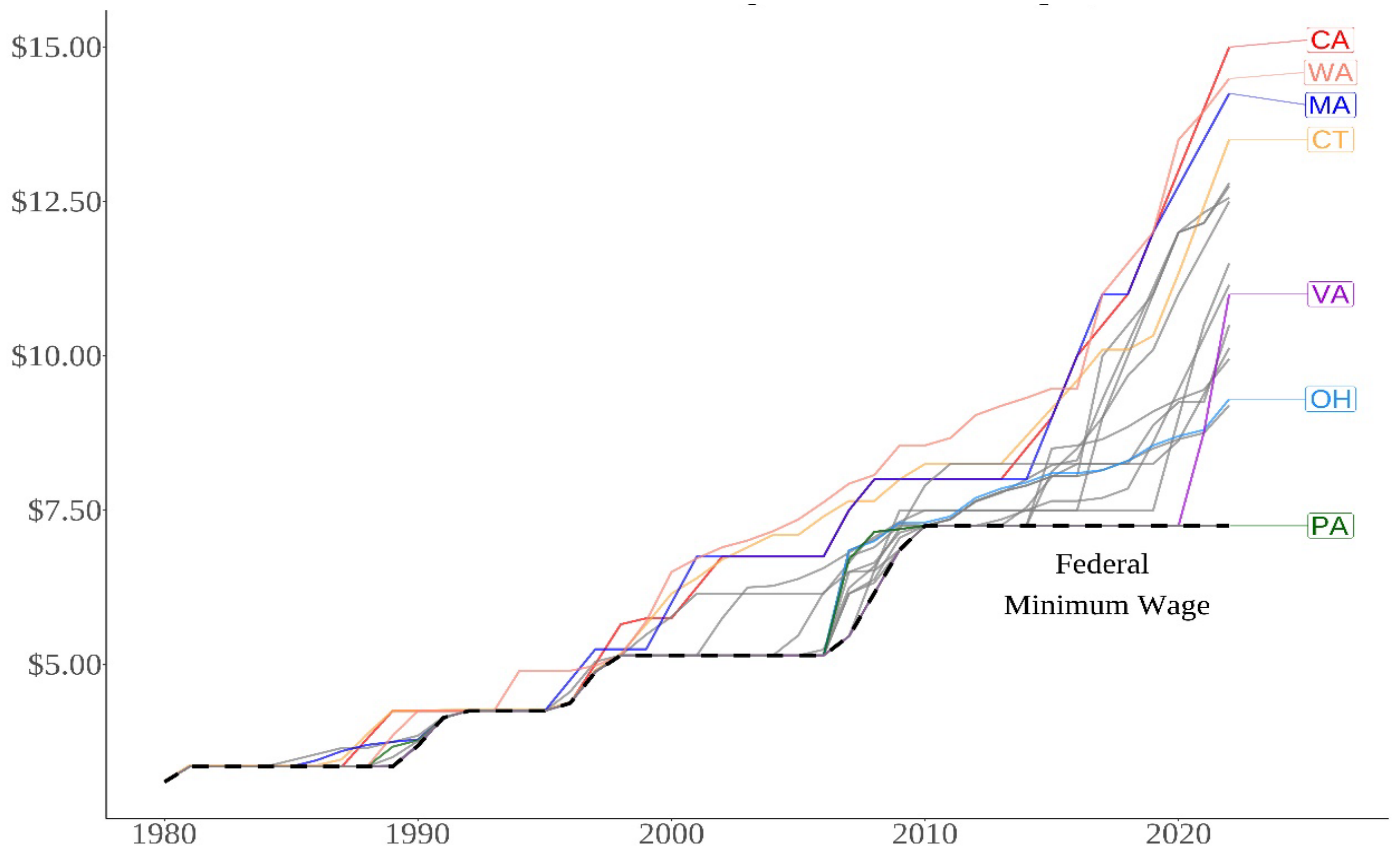
	Log cumulative LEHD earnings from focal SIPP year t-1 to indicated year			Log cumulative LEHD quarters worked from focal SIPP year t-1 to indicated year		
	[t-1, t+1]	[t-1, t+4]	[t-1, t+7]	[t-1, t+1]	[t-1, t+4]	[t-1, t+7]
	(1)	(2)	(3)	(4)	(5)	(6)
	A. Analysis using nominal minimum wage changes					
Nominal MW change from t-1 to period end	0.064	0.027	0.015	-0.033	0.002	0.002
X (0/1) MW worker in SIPP in period t	(0.046)	(0.027)	(0.016)	(0.024)	(0.015)	(0.008)
	B. Analysis using relative minimum wage changes compared to starting value in period t-1					
Relative MW change from t-1 to period end	0.434	0.221	0.079	-0.144	0.056	0.006
X (0/1) MW worker in SIPP in period t	(0.211)	(0.149)	(0.114)	(0.124)	(0.081)	(0.062)

Notes: Table reports regressions of LEHD earnings and quarters worked in years after an individual is observed in the SIPP. The dataset combines LEHD records from 1992-2021 and SIPP records from 1992-2016 using the 1993, 1996, 2001, 2004, 2008, and 2014 panels (all waves). SIPP individuals are timed to a primary year t that is the mid-point of their multi-year SIPP records, taking the earlier year in the case of even-numbered year spans (e.g., 2000 if an individual is observed 1999-2002 in SIPP). Included individuals are aged 23-49 years old in year t, have an identified SIPP wage, have LEHD earnings in t-1 and t, and are in a SIPP state with full LEHD records that commence by year t. The outcome variables model cumulative work history in the LEHD from period t-1 to t+1, t+4, and t+7, respectively (e.g., 1999-2004 for a focal SIPP year of 2000 in the t+4 analysis). The primary explanatory variables are the change in the minimum wage for the SIPP state (inclusive of federal rates) from period t-1 to the end of the indicated period (e.g., from 1999 to 2004 for a focal SIPP year of 2000 in the t+4 analysis), an indicator for an individual having earned minimum wages in period t, and an interaction of these two regressors. The table reports these interaction terms. Panel A uses nominal minimum wages over a period (e.g., 40 cents), while Panel B uses relative changes (e.g., 40 cents on an initial value of $5.00 is 8%). Regressions control for the age, education, race, sex, and family income status of an individual in year t as measured by the SIPP, the log LEHD earnings of an individual in t-1, and state-year fixed effects. Regressions are unweighted and have 54,500 observations. Reflecting the source of variation, standard errors are clustered by state x focal year x minimum wage status. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009.

Online Appendix Materials

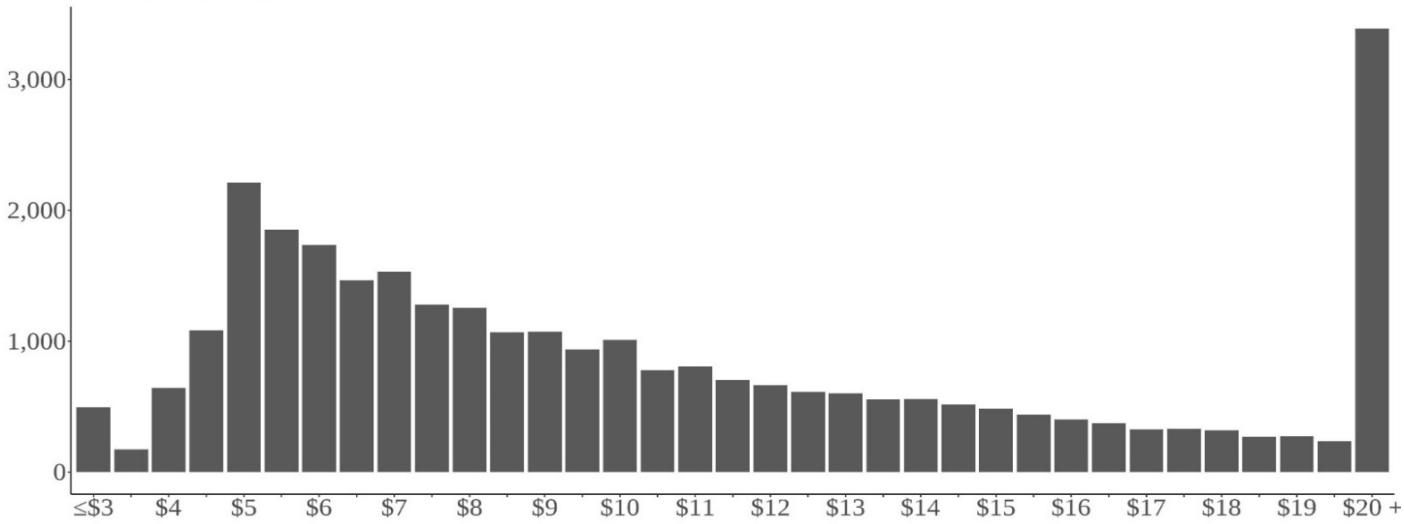
AF1	Federal and state minimum wages, 1980-2022
AF2	Public SIPP wage histogram for 1994-1998 sample
AF3	Figure 4 for all wage levels
AF4	Figure 4 with six age categories
AF5	Share of workers earning at or near minimum wages by age and family income level, 1992-2016
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AT1a	Match analysis of SIPP and LEHD, 1994-1998 sample
AT1b	Match analysis of SIPP and LEHD, 2005-2009 sample
AT2a	Distribution comparison of SIPP and LEHD, 1994-1998 sample
AT2b	Distribution comparison of SIPP and LEHD, 2005-2009 sample
AT3	Bottom-up comparison of 1994-1998 earnings in LEHD and SIPPs
AT4	Descriptive statistics on 1994-1998 and 2005-2009 SIPP panels
AT5a	Career trajectories for all individuals working in 1994-1998 SIPP
AT5b	Additional heterogeneity by age among young workers earning minimum wages in 1994-1998 SIPP
AT6	National employment rates for all individuals in 1994-1998 SIPP
AT7	LEHD cumulative earnings for 2005-2009 sample
AT8a	Career trajectories for all SIPP panels - Earnings (Figure 8, Panel A)
AT8b	Career trajectories for all SIPP panels - Quarters Worked (Figure 8, Panel B)
AT8c	Career trajectories for all SIPP panels - State Percentile (Figure 8, Panel C)
AT8d	Career trajectories for all SIPP panels - Share ≤25th Percentile (Figure 8, Panel D)
AT8e	Career trajectories for all SIPP panels - Sample Counts
AT9	National employment rates for all individuals in all SIPP panels

Appendix Figure 1: Federal and state minimum wages, 1980-2022



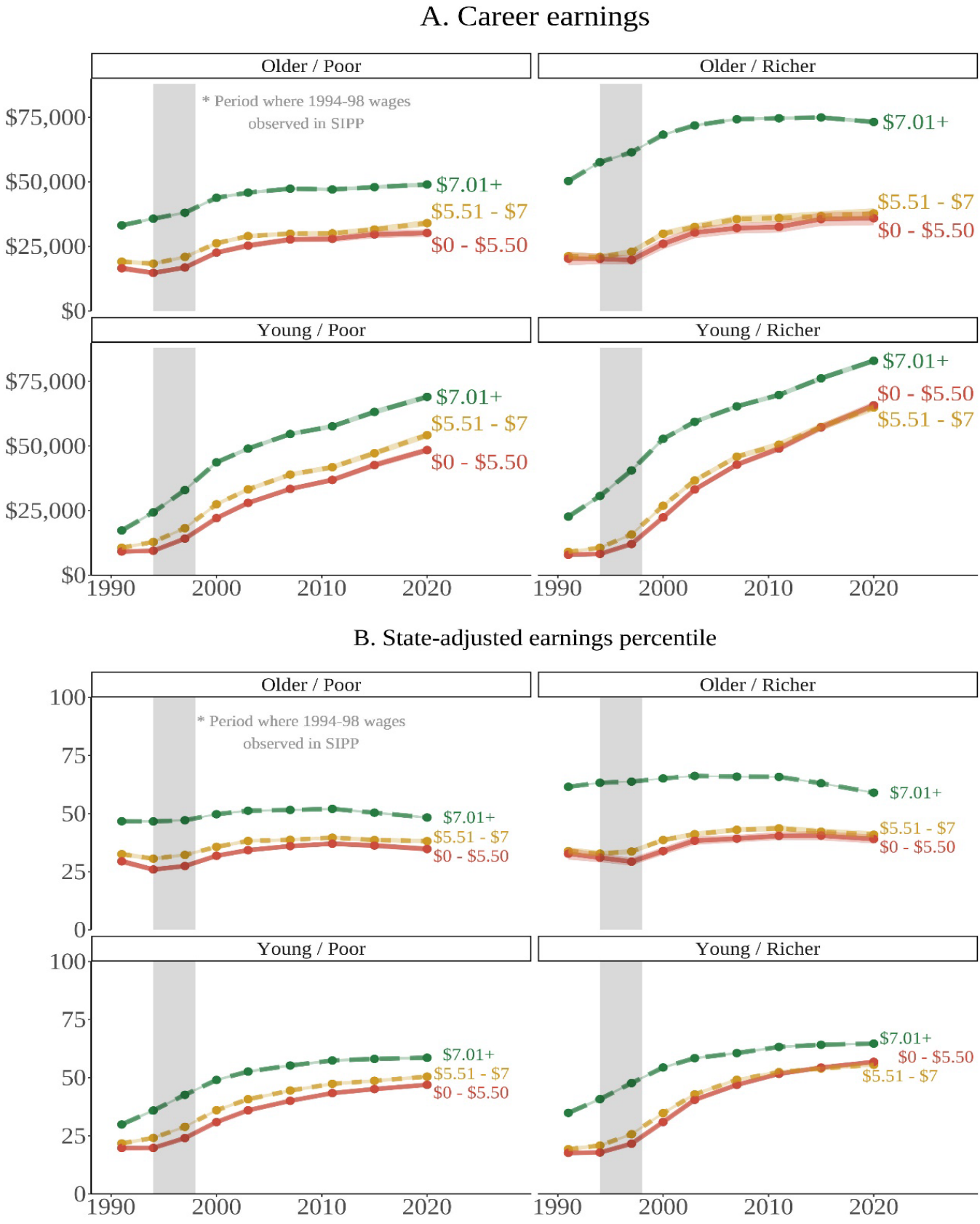
Notes: Figure extends Figure 1 to 1980-2022.

Appendix Figure 2: Public SIPP wage histogram for 1994-1998 sample



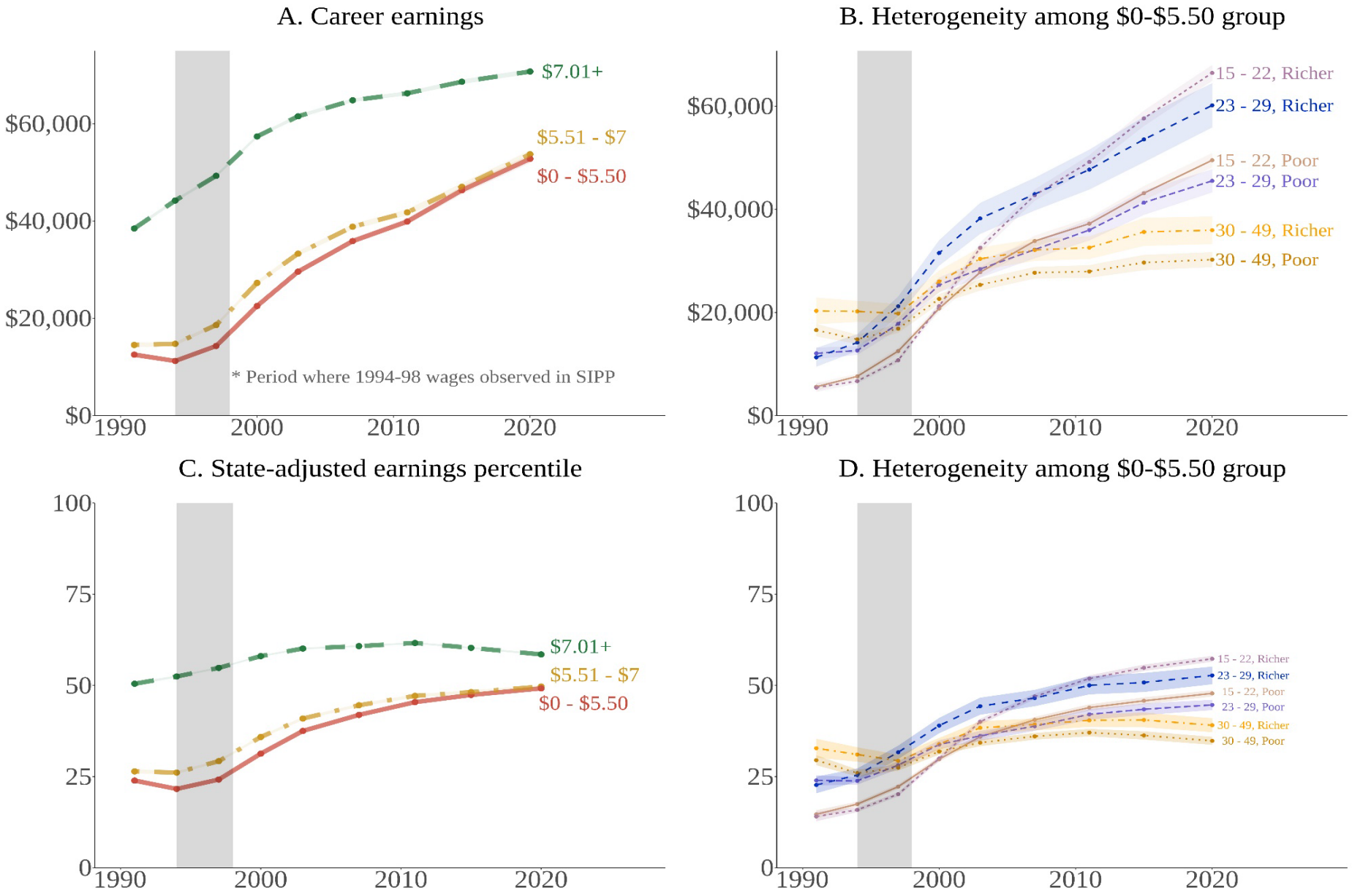
Notes: Figure reports hourly wage histogram from 1994-1998 public SIPP sample.

Appendix Figure 3: Figure 4 for all wage levels



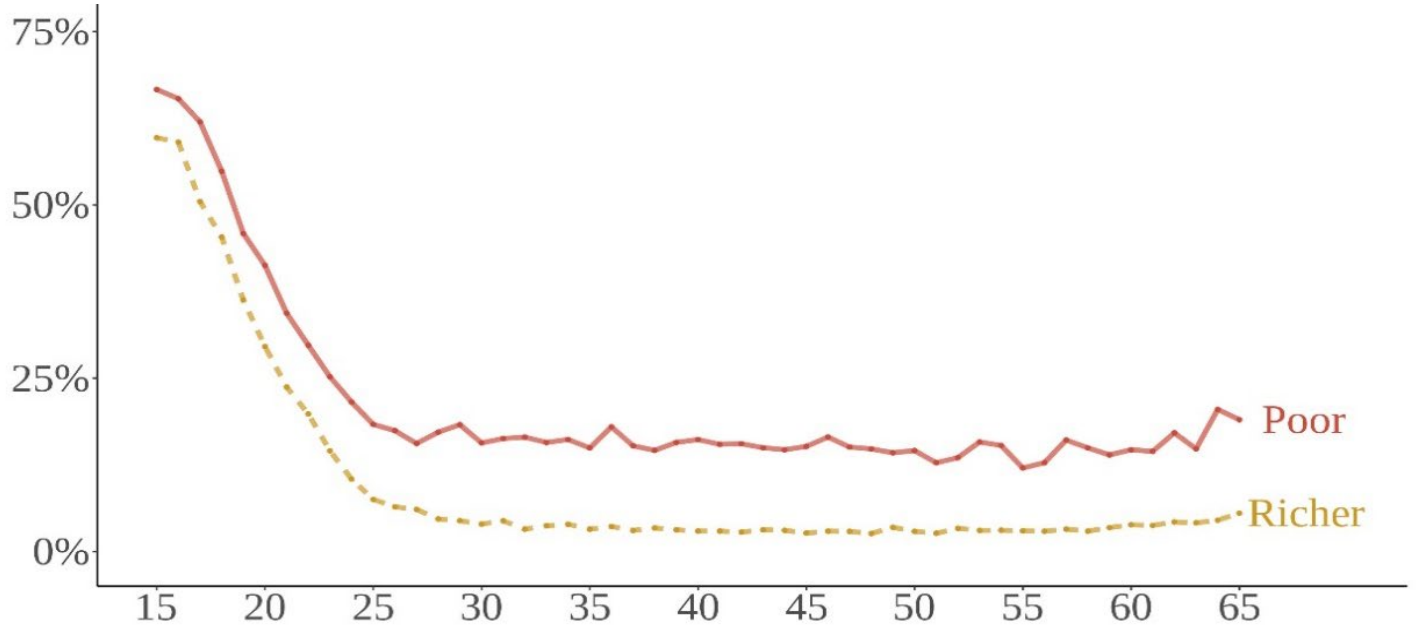
Notes: See Figure 4. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Appendix Figure 4: Figure 4 with six age categories



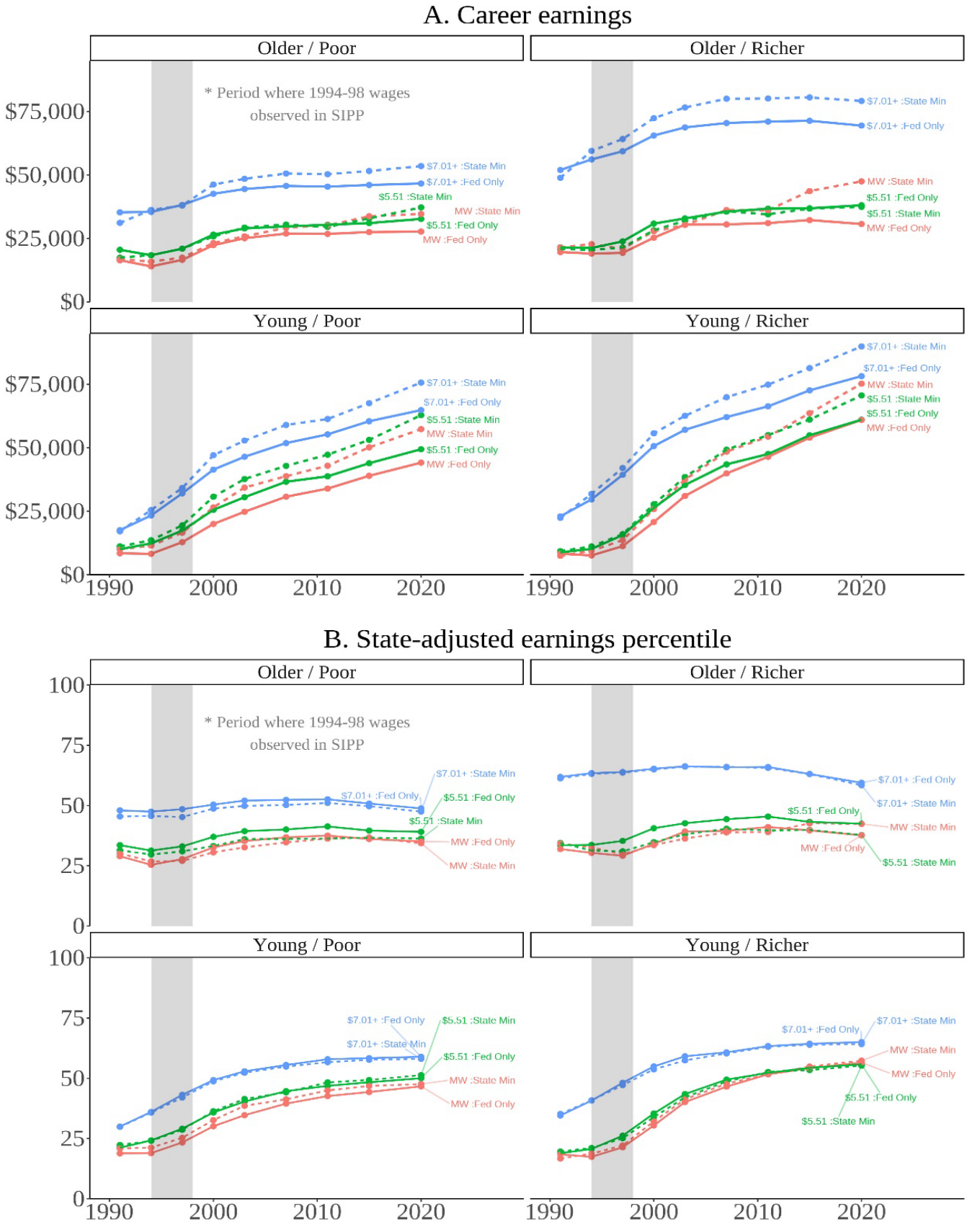
Notes: See Figure 4. The right-side panels separate the future career trajectories of workers earning minimum wages in 1994-1998 by six age bins: 15-22, 23-29, and 30-49. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Appendix Figure 5: Share of workers earning at or near minimum wages by age and family income level, 1992-2016



Notes: Figure extends Figure 2 to 1992-2016 and incorporates state minimum wages.

Appendix Figure 6: Extension of Figure 9's state comparison to include other wage groups



Notes: See Figure 9. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Appendix Table 1a: Match analysis of SIPP and LEHD, 1994-1998 sample

	Base data in 1994-1998 public SIPP files: aged 15-49 and in 22 states present in LEHD by 1998					
	Total count	Count of those known to be working	Count of those working and with wage data	Count of those working and with wages $0.01-$5.50	Column 1 matched to LEHD (rounded for disclosure)	Column 4 matched to LEHD (rounded for disclosure)
	(1)	(2)	(3)	(4)	(5)	(6)
Everyone 15-49	39,140	32,760	30,888	4,848	30,000	4,000
Young (aged 15-29) living in poor family	9,303 24%	6,868 21%	6,709 22%	1,964 41%	7,200 24%	1,600 40%
Young (aged 15-29) living in richer family	8,775 22%	7,093 22%	6,929 22%	1,639 34%	6,700 22%	1,400 35%
Older (aged 30-49) living in poor family	8,142 21%	6,665 20%	6,121 20%	921 19%	6,200 21%	750 19%
Older (aged 30-49) living in richer family	12,920 33%	12,134 37%	11,129 36%	324 7%	9,700 32%	250 6%

Notes: Table describes the match of the SIPP and LEHD for the 1994-1998 sample. Columns 1-4 use public SIPP data to describe the minimum wage component of the SIPP. Columns 5 and 6 provide matched LEHD counts, with LEHD counts rounded per Census Bureau requirements. Percentages report share of total in the column. Included individuals were present in 1993 (waves 4-9) or 1996 (waves 1-10) SIPP panel. The 22 states present in the LEHD sample: AZ, CA, CO, CT, DE, KS, MD, ME, MO, MT, ND, NM, NV, OH, PA, SC, SD, TN, VA, WA, WI, and WY. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520.

Appendix Table 1b: Match analysis of SIPP and LEHD, 2005-2009 sample

	Base data in 2005-2009 public SIPP files: aged 15-49 and in 25 states present in LEHD by 2009					
	Total count	Count of those known to be working	Count of those working and with wage data	Count of those working and with wages $0.01-$7.50	Column 1 matched to LEHD (rounded for disclosure)	Column 4 matched to LEHD (rounded for disclosure)
	(1)	(2)	(3)	(4)	(5)	(6)
Everyone 15-49	56,973	43,941	40,670	5,492	44,500	4,700
Young (aged 15-29) living in poor family	13,761 24%	8,876 20%	8,479 21%	2,225 41%	9,000 20%	1,800 38%
Young (aged 15-29) living in richer family	13,503 24%	9,299 21%	8,972 22%	1,896 35%	10,500 24%	1,800 38%
Older (aged 30-49) living in poor family	12,034 21%	9,462 22%	8,317 20%	1,005 18%	8,900 20%	750 16%
Older (aged 30-49) living in richer family	17,675 31%	16,304 37%	14,902 37%	366 7%	16,000 36%	300 6%

Notes: Table describes the match of the SIPP and LEHD for the 2005-2009 sample. Columns 1-4 use public SIPP data to describe the minimum wage component of the SIPP. Columns 5 and 6 provide matched LEHD counts, with LEHD counts rounded per Census Bureau requirements. Percentages report share of total in the column. The 25 states present in the LEHD sample include the 22 states listed in Appendix Table 1a plus MA, OK, and UT. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11627.

Appendix Table 2a: Distribution comparison of SIPP and LEHD, 1994-1998 sample

	Average point of individual in SIPP distribution of personal incomes	Average point of individual in LEHD distribution of personal earnings	Average point of individual in SIPP distribution of family incomes
	(1)	(2)	(3)
Full minimum wage sample	17.22 (0.197)	17.71 (0.141)	39.67 (0.418)
<u>Heterogeneity among minimum wage sample:</u>			
Older (aged 30-49) living in poor family	20.06 (0.432)	20.82 (0.333)	17.71 (0.396)
Older (aged 30-49) living in richer family	25.87 (1.098)	24.19 (0.691)	67.12 (0.842)
Young (aged 15-29) living in poor family	16.77 (0.277)	16.98 (0.215)	18.92 (0.294)
Young (aged 15-29) living in richer family	14.47 (0.327)	15.28 (0.219)	71.76 (0.388)

Notes: Table reports descriptive statistics measured from the SIPP and LEHD for the matched minimum wage samples. Tabulated values are average points of individuals in income and earnings distributions. Values only pertain to the period of SIPP measurement. LEHD earnings distribution are not state-adjusted for this comparison. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520, R11627.

Appendix Table 2b: Distribution comparison of SIPP and LEHD, 2005-2009 sample

	Average point of individual in SIPP distribution of personal incomes	Average point of individual in LEHD distribution of personal earnings	Average point of individual in SIPP distribution of family incomes
	(1)	(2)	(3)
Full minimum wage sample	17.90 (0.201)	21.17 (0.131)	40.81 (0.387)
Heterogeneity among minimum wage sample:			
Older (aged 30-49) living in poor family	21.90 (0.447)	26.87 (0.346)	19.02 (0.380)
Older (aged 30-49) living in richer family	26.56 (1.122)	31.79 (0.661)	64.62 (0.736)
Young (aged 15-29) living in poor family	16.81 (0.282)	19.70 (0.194)	20.12 (0.282)
Young (aged 15-29) living in richer family	15.36 (0.330)	17.94 (0.184)	72.07 (0.354)

Notes: Table reports descriptive statistics measured from the SIPP and LEHD for the matched minimum wage samples. Tabulated values are average points of individuals in income and earnings distributions. Values only pertain to the period of SIPP measurement. LEHD earnings distribution are not state-adjusted for this comparison. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520, R11627.

Appendix Table 3: Bottom-up comparison of 1994-1998 earnings in LEHD and SIPPs

	LEHD average earnings	SIPP average earnings for those identified as minimum wage workers through reported hourly wages	SIPP average earnings for those identified as minimum wage workers through an implied hourly wage	Share of minimum wage workers identified through reported hourly wage	SIPP average earnings combining Columns 2-4
	(1)	(2)	(3)	(4)	(5)
Everyone 15-49	$13,500	$12,546	$15,910	91.6%	$12,829
Young (aged 15-29) living in poor family	$12,500	$11,863	$14,466	93.4%	$12,035
Young (aged 15-29) living in richer family	$11,000	$11,284	$12,554	96.2%	$11,333
Older (aged 30-49) living in poor family	$16,000	$13,808	$17,756	85.8%	$14,369
Older (aged 30-49) living in richer family	$19,500	$17,049	$15,869	77.9%	$16,788

Notes: See Table 1. Column 1 provides the average LEHD earnings of the matched sample. Columns 2-5 show a bottom-up comparison using the public SIPP files based upon whether a worker is identified as a minimum wage worker through a direct reporting of hourly wage (Column 2) or an implied hourly wage (Column 3). Dollar values are expressed in real 2021 dollars. SIPP earnings are winsorized at the 5% and 95% levels like the LEHD earnings. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Appendix Table 4: Descriptive statistics on 1994-1998 and 2005-2009 SIPP panels

	1994-1998 SIPP Sample (n = 94,000)		2005-2009 SIPP Sample (n = 121,000)	
	(1)	(2)	(3)	(4)
Average age	30.86	(0.035)	30.93	(0.032)
Male	0.492	(0.002)	0.491	(0.001)
White	0.823	(0.001)	0.777	(0.001)
Employed	0.825	(0.001)	0.770	(0.001)
Hourly wage	$9.31	(0.021)	$12.32	(0.024)
Implied wage for non-hourly reporting	$12.69	(0.061)	$19.42	(0.148)
Modeled wage combining hourly and implied	$11.59	(0.047)	$17.22	(0.134)
Average weeks employed in month	2.893	(0.006)	2.823	(0.005)
Average family size	3.385	(0.006)	3.381	(0.005)
Average monthly family earnings	$3,851	(11.33)	$5,541	(14.75)

Notes: Table reports descriptive statistics measured from the SIPP for each sample that was matched to the LEHD. Values only pertain to the period of SIPP measurement. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520, R11627.

Appendix Table 5a: Career trajectories for all individuals working in 1994-1998 SIPP by initial traits only

	Average quarters employed in LEHD			Average real earnings of individuals observed in LEHD (winsorized at 5/95th percentiles by year, 2021$)			Average percentile of individuals indexed to LEHD earnings distribution of state		
	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Young (aged 15-29) living in poor family	2.816	3.237	3.499	$20,500	$37,000	$52,000	30.73	42.80	50.85
	(0.008)	(0.005)	(0.004)	(132.7)	(135.7)	(175.7)			
Young (aged 15-29) living in richer family	2.964	3.357	3.603	$25,500	$46,000	$67,000	34.40	48.68	58.92
	(0.007)	(0.004)	(0.004)	(173.3)	(161.5)	(201.7)			
Older (aged 30-49) living in poor family	3.193	3.455	3.536	$30,500	$39,500	$43,000	40.52	45.65	46.32
	(0.007)	(0.005)	(0.005)	(161.5)	(135.4)	(171.6)			
Older (aged 30-49) living in richer family	3.567	3.665	3.641	$56,500	$68,000	$71,000	60.60	63.29	60.96
	(0.004)	(0.003)	(0.003)	(170.9)	(150)	(192.2)			

Notes: See Panel A of Table 1. Tabulations separate individuals by age (15-29 vs. 30-49) and family income levels (separated at $3000 per month) when observed in the SIPP (regardless of initial wage level). Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Appendix Table 5b: Additional heterogeneity by age among young workers earning minimum wages in 1994-1998 SIPP

	Average quarters employed in LEHD			Average real earnings of individuals observed in LEHD (winsorized at 5/95th percentiles by year, 2021$)			Average percentile of individuals indexed to LEHD earnings distribution of state		
	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021	1994-1998	1999-2008	2009-2021
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aged 15-22 and living in poor family (n=1100)	2.472	3.048	3.406	$11,070	$27,750	$43,670	20.84	35.63	45.95
	(0.019)	(0.012)	(0.011)	(228.5)	(285.8)	(396.3)			
Aged 15-22 and living in richer family (n=1200)	2.568	3.212	3.554	$9,657	$32,720	$58,260	19.04	39.38	54.81
	(0.018)	(0.011)	(0.009)	(195.1)	(297.7)	(437.3)			
Aged 23-29 and living in poor family (n=500)	2.803	3.183	3.439	$15,930	$28,800	$41,120	26.53	36.35	43.43
	(0.029)	(0.019)	(0.017)	(402)	(477.8)	(658.2)			
Aged 23-29 and living in richer family (n=150)	2.967	3.405	3.569	$18,540	$37,830	$54,100	29.23	43.41	51.26
	(0.046)	(0.028)	(0.025)	(727.8)	(875.5)	(1249)			

Notes: See Panel B of Table 1. Tabulations split the 15-29 year old sample earning minimum wages into 15-22 and 23-29 year-old sub-samples. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11520. CBDRB-FY25-P2766-R11999.

Appendix Table 6: National employment rates for all individuals in 1994-1998 SIPP

1994-1998 Groupings:	Years present in either the LEHD National Employment Indicators file or the ILBD for self-employment: 1994-1998 (5 years)	1999-2008 (10 years)	2009-2021 (12 years)	Average share 1999-2021
	(1)	(2)	(3)	(4)
	A. Aggregate behavior by starting wage level in 1994-1998			
Not working or no wage data (n=11,500)	1.381 (0.016)	4.789 (0.037)	5.349 (0.051)	46.1%
Workers $0.01-$5.50 (n=8700)	2.677 (0.020)	7.314 (0.036)	7.920 (0.056)	69.2%
Workers $5.51-$7.00 (n=9700)	3.040 (0.019)	7.737 (0.032)	8.212 (0.052)	72.5%
Workers $7.01 and up (n=40,000)	3.314 (0.009)	7.932 (0.016)	8.110 (0.026)	72.9%
	B. Heterogeneity among $0.01-$5.50 workers in 1994-1998			
Aged 15-22 and living in poor family (n=2400)	2.625 (0.036)	7.778 (0.058)	8.995 (0.096)	76.2%
Aged 15-22 and living in richer family (n=2100)	2.693 (0.038)	8.318 (0.056)	9.860 (0.097)	82.6%
Aged 23-29 and living in poor family (n=1200)	2.890 (0.052)	7.175 (0.092)	7.785 (0.148)	68.0%
Aged 23-29 and living in richer family (n=300)	3.088 (0.108)	7.341 (0.205)	8.980 (0.287)	74.2%
Aged 30-49 and living in poor family (n=2100)	2.607 (0.042)	6.111 (0.085)	5.164 (0.114)	51.3%
Aged 30-49 and living in richer family (n=550)	2.415 (0.084)	6.293 (0.161)	5.932 (0.223)	55.6%

Notes: See Figure 5 and Appendix Tables 5a and 5b. Table reports descriptive values that aggregate LEHD National Employment Indicators file and the Integrated Longitudinal Business Database (self employment). These datasets cover all states. Disclosure conducted under FSRDC Project Number 2766. Original: CBDRB-FY24-P2766-R11520, Update: CBDRB-FY25-P2766-R11999.

Appendix Table 7: LEHD cumulative earnings for 2005-2009 sample

	Average quarters employed in LEHD 2010-2021	Total earnings in LEHD 2010-2021
	(1)	(2)
	A. Aggregate behavior by starting wage level in 2005-2009	
Not working or no wage	3.200	$395,000
	(0.005)	(1788)
Workers $0.01-$7.50	3.288	$342,600
	(0.005)	(1392)
Workers $7.51-$9.00	3.401	$384,300
	(0.004)	(1139)
Workers $9.01 and up	3.656	$770,200
	(0.002)	(995.8)
	B. Heterogeneity in sample earning $0.01-$7.50 during 2005-2009	
Young (aged 15-29) living in poor family	3.171	$308,400
	(0.009)	(2061)
Young (aged 15-29) living in richer family	3.318	$389,400
	(0.008)	(2218)
Older (aged 30-49) living in poor family	3.418	$292,100
	(0.013)	(3638)
Older (aged 30-49) living in richer family	3.489	$357,000
	(0.019)	(6385)

Notes: See Table 3. Table reports cumulative LEHD employment and earnings during 2010-2021 for 2005-2009 sample. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11627.

Appendix Table 8a: Career trajectories for all SIPP panels - Earnings (Figure 8, Panel A)

	Average real earnings of individuals observed in LEHD (winsorized at 5/95th percentiles by year, 2021$)					
	[t-7, t-5]	[t-4,t-2]	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)	(5)	(6)
Aged 15-22 and living in poor family (n=2800)	$5,210	$4,976	$6,775	$13,350	$20,420	$26,980
	(398.3)	(163)	(126.6)	(229.3)	(345.5)	(481.3)
Aged 15-22 and living in richer family (n=4600)	$5,926	$4,512	$5,820	$12,570	$23,090	$34,130
	(575.8)	(133.1)	(88.77)	(173.7)	(290.8)	(408.9)
Aged 23-29 and living in poor family (n=1500)	$8,545	$11,120	$12,390	$18,100	$23,260	$26,730
	(270.8)	(282.5)	(285.8)	(458.6)	(602.9)	(758.4)
Aged 23-29 and living in richer family (n=750)	$9,373	$13,250	$14,860	$22,530	$29,280	$35,670
	(487.2)	(539.8)	(520.2)	(728.5)	(1005)	(1209)
Aged 30-49 and living in poor family (n=2100)	$16,030	$15,220	$14,010	$17,200	$21,270	$23,520
	(433.5)	(367.5)	(305.6)	(378.8)	(475.3)	(583.7)
Aged 30-49 and living in richer family (n=1300)	$20,250	$19,040	$15,440	$20,520	$26,610	$31,070
	(834.1)	(704.2)	(507.2)	(609.5)	(717.8)	(890.1)

Notes: See Figure 8. Table reports t-indexed LEHD career profiles for individuals earning minimum wages when measured by the SIPP, combining federal and state minimum wage policies. The dataset combines LEHD records from 1992-2021 and SIPP records from 1992-2016 using the 1993, 1996, 2001, 2004, 2008, and 2014 panels (all waves). SIPP individuals are timed to a primary year t that is the mid-point of their multi-year SIPP records, taking the earlier year in the case of even-numbered year spans (e.g., 2000 if an individual is observed 1999-2002 in SIPP). Included individuals are aged 15-49 years old in year t, have an identified SIPP wage, have LEHD earnings in t-1 and t, and are in a SIPP state with full LEHD records that commence by year t. The three time periods [t-1,t+1], [t+2,t+4], and [t+5,t+7] have complete data coverage. The starting and ending periods of [t-7,t-5], [t-4,t-2], and [t+8,t+10] contain a subset of SIPP panels based upon the SIPP timing relative to LEHD. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Appendix Table 8b: Career trajectories for all SIPP panels - Quarters Worked (Figure 8, Panel B)

	Average quarters worked of individuals per year as observed in LEHD (inclusive of zeros if not observed)					
	[t-7, t-5]	[t-4,t-2]	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)	(5)	(6)
Aged 15-22 and living in poor family (n=2800)	1.965 (0.052)	2.079 (0.025)	2.288 (0.016)	2.691 (0.019)	2.868 (0.019)	3.050 (0.021)
Aged 15-22 and living in richer family (n=4600)	1.936 (0.051)	2.152 (0.022)	2.381 (0.012)	2.786 (0.014)	3.018 (0.014)	3.212 (0.014)
Aged 23-29 and living in poor family (n=1500)	2.395 (0.031)	2.497 (0.027)	2.623 (0.024)	2.859 (0.026)	3.026 (0.027)	3.075 (0.029)
Aged 23-29 and living in richer family (n=750)	2.488 (0.043)	2.703 (0.038)	2.790 (0.033)	3.116 (0.035)	3.201 (0.037)	3.319 (0.036)
Aged 30-49 and living in poor family (n=2100)	2.737 (0.029)	2.775 (0.024)	2.787 (0.020)	2.992 (0.023)	3.143 (0.024)	3.202 (0.026)
Aged 30-49 and living in richer family (n=1300)	2.861 (0.039)	2.963 (0.034)	2.847 (0.026)	3.135 (0.027)	3.237 (0.028)	3.379 (0.031)

Notes: See Figure 8 and Appendix Table 8a. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Appendix Table 8c: Career trajectories for all SIPP panels - State Percentile (Figure 8, Panel C)

	Average percentile of individuals indexed to LEHD earnings distribution of state					
	[t-7, t-5]	[t-4,t-2]	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)	(5)	(6)
Aged 15-22 and living in poor family (n=2800)	12.23 (0.558)	12.56 (0.231)	14.89 (0.168)	22.21 (0.249)	28.60 (0.329)	33.67 (0.411)
Aged 15-22 and living in richer family (n=4600)	12.48 (0.642)	11.61 (0.194)	13.54 (0.120)	21.38 (0.185)	31.07 (0.265)	39.75 (0.328)
Aged 23-29 and living in poor family (n=1500)	17.46 (0.348)	20.55 (0.336)	21.77 (0.314)	26.80 (0.436)	30.92 (0.520)	32.82 (0.601)
Aged 23-29 and living in richer family (n=750)	18.27 (0.548)	22.64 (0.552)	23.94 (0.513)	30.77 (0.654)	35.45 (0.795)	39.59 (0.897)
Aged 30-49 and living in poor family (n=2100)	25.99 (0.454)	24.92 (0.370)	23.31 (0.299)	26.17 (0.357)	29.40 (0.414)	30.82 (0.479)
Aged 30-49 and living in richer family (n=1300)	29.05 (0.758)	27.52 (0.637)	23.61 (0.462)	28.18 (0.517)	33.17 (0.585)	36.56 (0.693)

Notes: See Figure 8 and Appendix Table 8a. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Appendix Table 8d: Career trajectories for all SIPP panels - Share ≤25th Percentile (Figure 8, Panel D)

	Share of cohort earning less than or equal to the 25th percentile of their state's earnings distribution					
	[t-7, t-5]	[t-4,t-2]	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)	(5)	(6)
Aged 15-22 and living in poor family (n=2800)	0.90 (0.006)	0.92 (0.009)	0.87 (0.006)	0.63 (0.009)	0.44 (0.009)	0.36 (0.008)
Aged 15-22 and living in richer family (n=4600)	0.88 (0.004)	0.94 (0.007)	0.91 (0.004)	0.68 (0.007)	0.40 (0.007)	0.25 (0.006)
Aged 23-29 and living in poor family (n=1500)	0.78 (0.013)	0.67 (0.013)	0.64 (0.012)	0.50 (0.013)	0.41 (0.012)	0.39 (0.011)
Aged 23-29 and living in richer family (n=750)	0.76 (0.018)	0.63 (0.018)	0.58 (0.018)	0.40 (0.017)	0.31 (0.016)	0.26 (0.014)
Aged 30-49 and living in poor family (n=2100)	0.52 (0.010)	0.55 (0.011)	0.60 (0.011)	0.51 (0.011)	0.42 (0.010)	0.39 (0.009)
Aged 30-49 and living in richer family (n=1300)	0.47 (0.012)	0.50 (0.013)	0.61 (0.013)	0.49 (0.014)	0.36 (0.012)	0.30 (0.011)

Notes: See Figure 8 and Appendix Table 8a. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Appendix Table 8e: Career trajectories for all SIPP panels - Sample Counts

	Sample count (rounded for disclosure) observed in the LEHD and share relative to [t-1,t+1]					
	[t-7, t-5]	[t-4,t-2]	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)	(5)	(6)
Aged 15-22 and living in poor family (n=2800)	300	1,200	2,800	2,500 89%	2,300 82%	2,100
Aged 15-22 and living in richer family (n=4600)	350	1,600	4,600	4,100 89%	3,900 85%	3,600
Aged 23-29 and living in poor family (n=1500)	900	1,200	1,500	1,300 87%	1,200 80%	1,100
Aged 23-29 and living in richer family (n=750)	450	600	750	650 87%	600 80%	550
Aged 30-49 and living in poor family (n=2100)	1,200	1,600	2,100	1,800 86%	1,500 71%	1,300
Aged 30-49 and living in richer family (n=1300)	650	850	1,300	1,100 85%	1,100 85%	850

Notes: See Figure 8 and Appendix Table 8a. Table provides the sample count underlying values in Appendix Tables 8a-8d. The three time periods [t-1,t+1], [t+2,t+4], and [t+5,t+7] have complete data coverage. The starting and ending periods of [t-7,t-5], [t-4,t-2], and [t+8,t+10] contain a subset of SIPP panels based upon the SIPP timing relative to LEHD. The shares in Columns 4 and 5 provide sample attrition during the years with full panel representation. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12009, R12409.

Appendix Table 9: National employment rates for all individuals in all SIPP panels

	Average years observed in LEHD National Employment Indicators file or the ILBD for self-employment [max of 3 years]			
	[t-1, t+1]	[t+2, t+4]	[t+5, t+7]	[t+8, t+10]
	(1)	(2)	(3)	(4)
	A. All SIPP individuals			
Not working or no wage data (n=43,000)	0.580 (0.005)	0.961 (0.006)	1.194 (0.006)	1.266 (0.007)
Workers earning minimum wage, state included (n=27,000)	1.877 (0.007)	2.214 (0.007)	2.208 (0.007)	2.107 (0.008)
Workers earning $0.5-2.50 above minimum wage (n=26,000)	2.124 (0.007)	2.353 (0.007)	2.320 (0.007)	2.206 (0.008)
Workers earning $2.51+ above minimum wage (n=133,000)	2.386 (0.003)	2.472 (0.003)	2.408 (0.003)	2.284 (0.003)
	B. Heterogeneity among individual earning minimum wages			
Aged 15-22 and living in poor family (n=6100)	1.830 (0.015)	2.299 (0.013)	2.321 (0.013)	2.239 (0.015)
Aged 15-22 and living in richer family (n=8400)	1.882 (0.012)	2.440 (0.010)	2.487 (0.010)	2.424 (0.011)
Aged 23-29 and living in poor family (n=2900)	2.021 (0.022)	2.141 (0.021)	2.118 (0.022)	2.016 (0.024)
Aged 23-29 and living in richer family (n=1300)	2.105 (0.032)	2.143 (0.033)	2.132 (0.034)	2.054 (0.037)
Aged 30-49 and living in poor family (n=5200)	1.825 (0.017)	1.914 (0.018)	1.820 (0.018)	1.645 (0.020)
Aged 30-49 and living in richer family (n=3000)	1.807 (0.023)	2.023 (0.023)	1.980 (0.024)	1.711 (0.028)

Notes: See Figures 5 and 8 and Appendix Table 6. This provides t-indexed LEHD career profiles for individuals on the minimum wage when measured by the SIPP. Period t is set to the focal point of the SIPP observation period for each individual. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY25-P2766-R12124, R12045.