Who supports workers through job loss and social crisis?*

Meta Brown, Rachel Dwyer, Stephanie Moulton, and Sungmin Park

The Ohio State University

September 17, 2024

Abstract:

Economists estimate that a minority of eligible US workers claim unemployment insurance in the event of job loss, and that this follows a decades-long decline in UI claiming (Lachowska et al. 2022, O'Leary et al. 2023). This paper uses administrative data from Ohio's state unemployment insurance system, matched to Experian credit reports, to ask whether UI under-claiming is concentrated in younger, middle aged, or older workers. Relying on the mass layoff techniques of Jacobsen et al. (1993) and others, we find that workers in their twenties, fifties, and sixties draw approximately half as much unemployment insurance as mid-career workers in response to layoffs, and that this is equally true in terms of claiming, receipt, and benefit amount. If younger and older workers do not rely on UI benefits, where else do they turn for support through unemployment? Our population-level Ohio credit report data allow us to identify workers' reliance on consumer lending markets, as well as family connections including shared residence and accounts. We estimate that younger displaced workers actually decrease credit card borrowing in response to job loss, rely little on lender forbearance, and do not move home to parents at higher rates. We do note, however, that young workers with credit report evidence of intergenerational support are substantially less likely to draw UI benefits. Reliance on UI benefits, new borrowing, and lender forbearance in response to mass layoff all peak at midlife, while older workers show minimal reliance on all outside sources of support. Finally, we estimate the extent of employment and financial recovery that displaced Ohio workers achieve: young workers make the most complete recovery, in terms of employment and earnings, though they suffer persistent credit score declines; mid-career workers accomplish moderate career recovery and complete financial recovery; and older workers suffer large and persistent declines in employment, earnings, and credit scores in response to mass layoff.

Keywords: Job displacement, unemployment insurance, intergenerational transfers, consumer credit

1. Introduction

US states' unemployment insurance (UI) programs are designed to help displaced workers sustain consumption through unemployment spells. The UI system acts as an automatic stabilizer, protecting workers against job loss as it protects the broader economy against deepening downturns. Recent evidence, however, establishes displaced workers' low rate of unemployment insurance take-up. Lachowska et al. (2022) estimate that 29 percent of "monetarily eligible" displaced workers, or 45 percent of monetarily eligible displaced workers who do not quickly find re-employment, receive unemployment insurance. They demonstrate that "the dominant source of targeting error in the UI system is that eligible workers do not apply." O'Leary et al. (2023) note a steep decline in UI receipt over the past three decades. These concerning developments lead us to ask: which displaced workers are failing to draw UI benefits? What sources of support do displaced workers find instead? And, finally, given this assortment of supports, how completely are workers able to recover from job loss?

The impacts of job displacement vary meaningfully across the life cycle. Extensive research has examined the degree of career "scarring" that follows early-career job loss.[1] Mid-career losses are noteworthy for their impact on dependents.[2] Late-career job loss may precipitate early retirement, or, alternatively, may force prolonged work at lower wages.[3] By the same token, we may expect displaced workers' supports to differ with the worker's life stage. Therefore, we begin by estimating UI take-up across the life cycle.

Using administrative data on a randomly chosen 20 percent subsample of all workers who have jobs that are covered by the state of Ohio unemployment insurance system, we are able to ask whether unemployment insurance take-up differs importantly by age. Are workers at earlier or later career stages more apt to leave benefits on the table? Our approximately 20 percent coverage of Ohioans in traditional employment allows us to estimate unemployment application and benefit receipt around a job displacement event with precision for decadal age groups, and thereby to identify the life stages at which UI take-up is lacking. This is to say that we identify the subset of displaced workers by age who are, for

---

[1]See Ruhm (1991), Bell et al. (2018), Eliason and Storrie (2006), Jarosch (2023), Schmillen and Umkehrer (2017), and Huckfeldt (2022).

[2] See Bubonya et al. (2017), Hilger (2016), Rege et al. (2011), Kalil and Wightman (2011), Schaller and Zerpa (2019), and Ananat et al. (2011).

[3] See Chan and Stevens (1999), Hetschko et al. (2019), Heisig and Radl (2017), Lammers et al. (2013), and Tatsiramos (2010).

reasons attributable to the worker, the employer, or the program, missed by Ohio's state unemployment insurance system.[4]

A concern for all job loss studies is that, in the broad population of workers, those workers that separate from employment may not be comparable to workers who remain, in terms of both observable and unobservable characteristics. Jacobson, LaLonde, and Sullivan (1993), hereafter JLS, dealt with this concern by identifying firms in Pennsylvania state unemployment insurance system data who laid off a large percentage of workers, and then following the workers who left the mass layoff firms and the observably comparable workers who stayed with those same mass layoff firms. Their reasoning was that workers separated in a mass layoff were unlikely to have left voluntarily, and also unlikely to have separated for (observed or unobserved) cause. Their methods generated pre-separation trends in which leavers and stayers in mass layoff firms looked closely comparable. JLS spawned a rich literature using mass layoff events to estimate the causal effect of job loss on: earnings losses (JLS, Couch and Placzek 2010), the return to community college training among displaced workers (JLS 2005), the job transition sources of earnings loss for displaced workers (Lachowska, Mas, and Woodbury 2020, hereafter LMW), mortality (Sullivan and von Wachter 2007), and many other outcomes. Moreover, recent research from Flaaen, Shapiro, and Sorkin (2019) combines survey with administrative data on mass layoffs and the reasons behind separations to find earnings effects of layoffs that are surprisingly close to the administrative data-only estimates.

In this paper, we use anonymized firm identifiers in the Ohio Longitudinal Data Archive (OLDA)'s Ohio Department of Job and Family Services (ODJFS) worker sample, anonymously hashed to Ohio State University Consumer Credit Panel (OSU-CCP) credit data, to identify those workers who separate from, and stay with, mass layoff employers. We build our mass layoff sample using only firms that employ at least 25 workers and then shed at least 30 percent of their workers over the course of a two-year estimation window.[5] Sample displaced workers are required to have worked for the firm during each of eight quarters preceding a separation, while sample stayers are required to have worked for the firm throughout the pre-event quarters and six quarters beyond. Event study estimates in this worker sample regress employment and financial outcomes on time until and since displacement, controlling for

---

[4] Lachowska et al. (2022) describe workers', employers', and government programs' contributions to failed take-up.
[5] The employment loss criteria are applied using Quarterly Census of Employment and Wages-sourced information on firm level headcounts provided in conjunction with the ODJFS OLDA data, as opposed to inferring employment declines from the 20 percent worker subsample.

individual, industry-quarter, and location-quarter fixed effects. By and large, our approach is to adopt standard methods from the existing mass layoff event study literature, with some adaptations for our timeframe, data, and context.

Job loss presumably matters differently overall, and at differing career stages, during times of stability and crisis. A final important feature of our application is its timing. We estimate the effects of job loss on work and finances across the life cycle in two time periods, the comparatively stable pre-pandemic years and the COVID-19 pandemic. The possibilities for returning to work and their age gradient were quite different in the pre-pandemic and pandemic years, and our estimation approach allows us to understand both. In the pre-pandemic sample, workers enter the quarterly panel in the second quarter of 2016, treated workers suffer displacement in the second quarter of 2018, and we trace their recovery, in comparison with stayers, through the fourth quarter of 2019. Using parallel timing to shape the pandemic sample, pandemic sample workers enter the panel in the second quarter of 2018, treated workers suffer displacement in the second quarter of 2020, and we trace their recovery, in comparison with stayers, through the fourth quarter of 2021. Thus we are able to compare job loss supports and recovery across the life cycle in the stable economy of 2018-2019 and the crisis of 2020-2021.

We estimate the causal effect of a mass layoff from the worker's primary employer on UI recipiency. We find that displaced (UI eligible) workers in their twenties, fifties, and sixties rely markedly less on traditional job loss supports, drawing unemployment insurance at roughly half the rate of mid-career workers during the stable period, all else equal. This finding is equally true for UI claiming, UI receipt, and UI benefit amounts, and throughout the first three quarters following displacement. It appears that the under-claiming phenomenon described by Lachowska et al. (2022) and O'Leary et al. is concentrated among early- and late-career workers, at least in the case of Ohio.

If younger and older workers are half as reliant as mid-career workers on unemployment insurance in the event of layoff, where else do they turn for support during unemployment? Though a complete accounting of sources of support in unemployment is infeasible, our data are rare in that they allow glimpses into borrowing and accommodations provided by the private consumer lending market and into family sources of support.

A second support used to ease the consumption drop suffered by displaced workers is reliance on private, lender-provided consumer credit. Displaced workers may not qualify for new lines of credit as a result of income loss. However, to the extent that workers' revolving credit access survives a job

4

separation, displaced workers may support consumption in the face of income loss by borrowing.[6] Alternatively, at lowered income, the worker's marginal utility of consumption may rise to the point that reallocating some resources away from debt payment toward consumption becomes welfare-improving, despite the cost of delinquency in terms of lost access to future credit.[7] Existing debt obligations vary across the life cycle, with combined secured and unsecured debt typically lowest in early adulthood, peaking at midlife, and declining through retirement. Recent trends, however, have seen real debt increasing at older ages. Regarding new borrowing, both credit scores and existing credit lines increase steeply, approximately monotonically, with age.[8] These facts together suggest that displaced workers' opportunities to support consumption through a job loss using new borrowing may vary with age, and, further, that their need and qualification for forbearance and their propensity to miss debt payments may also depend heavily on their life cycle stages.

We use our matched OSU-CCP consumer credit histories and OLDA-ODJFS jobs data to track borrowing, measured creditworthiness, forbearance, and repayment through job loss. We have built this near-comprehensive data resource in collaboration with Experian, the Ohio Longitudinal Data Archive (OLDA), and the Ohio Department of Job and Family Services (ODJFS), and benefitting from oversight, restricted and anonymized matching, and expert guidance from Ohio State's CHRR. Owing again to the size and coverage of this data resource, we are able to estimate the pattern of borrowing, repayment, forbearance, and credit score through the job loss experience for decadal samples, and to identify these patterns at a quarterly frequency around job loss in decadal age samples with notable precision. We use this approach to ask, separately, whether younger and older displaced workers are able to access borrowing to support consumption through unemployment, whether lender accommodations find them, whether they fall delinquent in the repayment of their loans, and whether they experience short-term and persistent credit score setbacks in response to job loss. Which age groups successfully turn to private lenders to sustain consumption through job loss, and which age groups suffer diminished forward-looking access to credit as a result of displacement?

Displaced middle aged workers increase credit card borrowing in response to job loss, suggesting that they are able to replace lost income with new borrowing, or decreased repayment. Young displaced

---

[6] See Braxton et al. (2020), Keys (2018), Aaronson et al. (2019), and Dempsey and Ionescu (2021).

[7] See Athreya et al. (2012), Blattner et al. (2022), and Chatterjee et al. (2023).

[8] See Brown et al. (2020) regarding outstanding debt over the life cycle, the recent "graying" of US debt, and the steep, monotonic, near-linear association between age and credit score. On developments in debt at older ages, see Collins et al. (2013) and Lusardi, Mitchell, and Oggero (2020).

workers, however, substantially decrease credit card borrowing following job loss, which only reinforces any consumption deficit. Older workers show little response to job loss in their credit behavior until six quarters after displacement, at which point credit score damage begins to emerge. In sum, younger and older workers' credit behaviors reflect little consumption support from consumer lending markets, and some loss of financial stability, in response to job loss; only displaced middle-aged workers show evidence of supporting consumption through credit behaviors.

Finally, intergenerational co-residence has long been recognized as a margin along which young adult workers may accommodate labor market and financial setbacks (Kaplan 2012, Dettling and Hsu 2018, and Bleemer et al. 2024). More broadly, young workers may have greater existing connections to financially supportive extended family. We use our unusually rich data on networks of Ohioans to investigate the extent to which younger displaced workers turn to their elders for support through job loss, along with the extent to which such reliance substitutes for, or displaces, more traditional government benefits and lender credit and accommodations. Because our OSU-CCP credit report data include near-population coverage of adult Ohioans with credit reports, as well as indicators connecting reports coming from the same household and proprietary methods of tracking shared credit accounts, we are able to identify intergenerational co-residence and intergenerational account sharing at a quarterly frequency. When combined with our 20 percent employment sample, these data allow us to ask several questions relating to support through job loss: Do young workers move home to parents or similar elders in response to job loss? Do they rely on new shared credit with parents or similar elders? And are young displaced workers who have intergenerational sources of financial and residential support the specific young workers who fail to connect with state unemployment insurance benefits and lender accommodations in the event of job loss?

We estimate that young workers do not respond to job loss by moving home to elders. Approximately half of our young worker sample co-resides with parents or similar elders at the time of job separation. Despite the lack of evidence of transitions home to parents following job loss, our estimates do give some indication of a role for family support through unemployment: the approximately half of young workers who co-reside with elders are estimated to increase their UI receipt only half as much as non-co-resident young workers in response to layoff. Put differently, we find that those younger workers whose credit and employment records reflect intergenerational support are indeed the young workers who rely least on public unemployment insurance benefits.

These three categories of support, taken together, shape the employment and financial recovery that we observe among early-, mid-, and late-career displaced workers through the first six quarters following displacement. In order to understand the effectiveness of each age group's sources of support, we next estimate the extent of each age group's recovery from job loss in terms of re-employment, conditional earnings, and credit score.

Despite limited reliance on traditional unemployment supports, and perhaps owing to help from family, younger displaced workers accomplish the most successful career recovery. By six quarters out, young displaced workers recover most completely in terms of employment and conditional earnings. Along the way, the speed of their re-employment and the progress of their earnings recovery looks similar to that of displaced mid-career workers. These recovery dynamics are notable as evidence of the success of young workers' coping methods, but also because they allow us to rule out the hypothesis that younger workers fail to draw UI benefits as a result of rapid re-employment. Meanwhile, displaced older workers are substantially less reliant on outside support from all sources, and they suffer substantial and persistent loss of both employment and earnings. Financial recovery, in terms of delinquency and credit score, is most complete among mid-career workers, while displaced younger and older workers' financial profiles retain marks of past hardship. From the perspective of policy, (UI covered) younger and older workers are estimated to enjoy less effective insurance from Ohio's unemployment insurance system. Enhancing the effectiveness of job loss protections for early- and late-career workers may provide them needed financial protection, and may even lessen the career hardships experienced by displaced older workers.

This paper is organized as follows. Section 2 details our anonymized state of Ohio and private Experian data sources and anonymized hashing to create a near-comprehensive description of Ohio workers' finances, employment, and household structures. Section 3 develops our mass layoff estimation methods, including inherited features and special adaptations for our timing and data. In Section 4, we report estimates of the effect of job displacement through mass layoff for young, middle aged, and older workers using a series of event study figures. Section 5 offers some concluding discussion.

2. Data and Sample Construction

We construct a unique panel dataset for this analysis, combining data on adults ages 20 and older in Ohio from two sources. The first is the Ohio State University Consumer Credit Panel (OSU-CCP), a

quarterly administrative panel dataset of consumer credit information built from credit panel data provided to us as a part of an ongoing collaboration by Experian, one of three national credit bureaus. Experian's data cover the full population of adults with credit records in the state of Ohio, about 10 to 11 million credit fileholders each quarter, from the last quarter of 2015 to the last quarter of 2021. Drawing its data originally from these Experian Consumer Credit data and Experian Clarity Services data of the same period, the OSU-CCP contains randomly assigned, anonymous consumer and household identifiers that enable us to track individuals and their households over time. It contains over two thousand credit attributes including account balances (e.g., credit cards, student loans, auto loans, and mortgages), Vantage credit score, account openings, credit inquiries, payment delinquency and forbearance, as well as basic demographic information such as age, gender, and ZIP code. In addition to the individual-level credit attributes, the OSU-CCP contains trade-level data whose detailed account information enables us to trace financial connections through joint accounts and authorized user accounts. (8.2 million individuals).

Our second data source is the Ohio Longitudinal Data Archive (OLDA).[9] Managed by CHRR (previously the Center for Human Resource Research) at the Ohio State University, the OLDA contains the public administrative records of working individuals in Ohio. The quarterly OLDA employment data allow us to observe the worker's wage income during the quarter, with separation of income across multiple employers for a given worker. The data also include weeks worked for each employer, and the weekly status of their unemployment insurance (UI) including their claims and benefits received. Crucially, the OLDA data include an anonymized employer identifier for each worker-job combination. Supplemental Quarterly Census and Wage (QCEW) data are appended that describe characteristics of the anonymized firm, including, for firms of sufficient size, employment headcount and industry. Like the OSU-CCP data, the OLDA data contain unique (anonymized) identifiers for individuals and employers, enabling us to track workers, firms, and worker-firm matches over time. Unlike the OSU-CCP data, however, we have access to the OLDA data for only a 20 percent random sample of UI-covered Ohio

---

[9] The Ohio Longitudinal Data Archive is a project of the Ohio Education Research Center (oerc.osu.edu) and provides researchers with centralized access to administrative data. The OLDA is managed by The Ohio State University's Center for Human Resource Research (chrr.osu.edu) in collaboration with Ohio's state workforce and education agencies (ohioanalytics.gov), with those agencies providing oversight and funding. For information on OLDA sponsors, see http://chrr.osu.edu/projects/ohio-longitudinal-data-archive.

workers.[10] Consequently, we estimate using a merged dataset that matches the 20 percent worker subsample with the corresponding subset of the population-level Ohio credit data.[11]

While our data are limited to one state, Ohio includes diverse urban and rural communities, with 16 metropolitan statistical areas and 32 counties in the rural Appalachian region. Ohio mirrors the nation with regard to its age and gender distribution, the percent of individuals who identify as Black, and the percentage of individuals in the labor force.[12] Thus, the Ohio worker population constitutes a reasonably close approximation to the US worker population, and our sample offers meaningful heterogeneity along many dimensions, including affluence and hardship.

The OSU-CCP data include household identifiers based on fileholders' masked addresses, down to the apartment number. We append to our 20 percent worker sample additional credit data representing all adult Ohio credit fileholders who share an address with the primary 20 percent sample member. We are also able to append the household members' Ohio unemployment insurance system employment records, if the household member works in the state of Ohio in a UI-covered job. Note that most traditional employment is covered by the state of Ohio unemployment system. Professional roles, including employment in law, medicine, and business management, are generally included in the employment records. But so is part- and full-time wage work in retail, restaurants, and hospitality. Of course, some work is necessarily excluded from state unemployment insurance coverage (in Ohio and in all US states). This includes religious employment, work for the federal government, and contract work. The latter is a growing category of employment that includes most app-based gig work.[13] Finally, Ohio unemployment system employment records are unable to represent informal work that is compensated "under the table"; this includes unreported paid caregiving work. The unemployment records do account for household employment when it is reported to the state UI system by household employers, a step that is legally required but far from universal. As a result, our worker samples are able to represent the bulk of salaried

---

[10]   The 20 percent random sample is based on the last digits of anonymized consumer identifiers, similar to Lee and Van der Klaauw (2010).

[11] Moreover, we are able to pull in credit, employment and UI records for all adults at the address of each primary sample member, so that we can study the households of all of the Ohioans in our 20 percent worker sample, not merely those whose adult household members are also included in the 20 percent random sample of workers with UI-covered Ohio jobs.

[12] U.S. Census Bureau; https://www.census.gov/quickfacts/fact/table/OH,US/PST045219, April 26, 2021. It is important to note that the Ohio population does not mimic the US population distribution specifically in terms of the share of workers who identify as Hispanic.

[13] See Garin et al. (2022a, 2022b) on the emergence of gig work over our sample period.

and wage work in the state of Ohio, with the notable exceptions of religious, federal government, gig market, and unreported informal sector employment.

Our estimation exercise requires the construction of a specialized mass layoff worker sample, and a parallel all-firm leaver and stayer comparison sample. In both, we begin by requiring that workers work with an observed primary employer (using the anonymized employer identifier and chosen by requiring that the worker earn the majority of their UI-covered pay from this employer) for eight quarters, either from 2016Q2 through 2018Q1 for the stable economy sample or from 2018Q2 through 2020Q1 for the pandemic sample.[14] Next, we select, as our treatment group, displaced workers who separated from the primary employer in 2018Q2 (2020Q2) and experienced a reduction in earnings in the quarter of 50 percent or more.[15] Finally, we construct a control sample of workers who meet the pre-period stable employment criterion and also remain with the same stable pre-period employer throughout the subsequent six quarters. The merged treatment and control worker samples constitute our estimation sample for the all-firm analysis, with event study estimates reported in the appendix. Clearly, the stayers and leavers in this all-firm sample need not be comparable on various dimensions, and so these estimates stand as a description of the differing work and financial experiences of Ohioans who stay with and leave stable jobs, for young, middle aged, and older workers.

In order to isolate mass layoff firms, we turn to the described QCEW data on (anonymized) firm characteristics. We restrict our analysis to firms with 25 or more employees at some point in the treated workers' eight-quarter pre-separation period, either 2016Q2-2018Q1 or 2018Q2-2020Q1.[16] Next, we require that the firm shed at least 30 percent of its peak pre-displacement headcount at some point during the subsequent six quarters. We perform our mass layoff analysis using a merged dataset comprising

---

[14] The literature following Jacobson et al. (1993) uses different numbers for the workers' required prior tenure. Jacobson et al. (1993) and Aaronson et al. (2019) require six years, focusing on estimating the effects of job displacement on high-tenure workers. Davis and Wachter (2011) and Braxton et al. (2020) use three years, focusing on mid-tenure and high-tenure workers; Keys (2018) places no requirement on tenure; East and Simon (2022) require one year. Our focus on young workers, who are characterized by high turnover, pushes us to set a relatively short stable employment requirement in order to retain a sufficient and representative sample of young workers for our analysis.

[15] These criteria impose that sample workers must separate from their longtime primary employer. The 50 percent earnings reduction threshold requires that the worker leave a primary employer who paid the majority of their UI-covered earnings, but allows for the common circumstance in which the worker maintains a low-paying second job throughout the separation quarter.

[16] Most papers in the literature require mass-layoff firms to have at least 50 employees, except for Braxton et al. (2020) who use 25 employees. In order to retain sample size to track decadal age groups, we use the more lenient cutoff.

workers who have left these mass layoff firms and workers who remain steadily employed with these same mass layoff firms throughout the eight- plus six-quarter estimation window. This approach tolerates a loss in the generalizability of results, owing to its selected set of employers, in order to attempt to generate comparable leavers and stayers, and thereby identify the causal effect of job displacement on sample members' work and financial outcomes.

Our methods are derived from the long history of mass layoff studies, including JLS, LMW, Couch and Placzek (2010), Sullivan and von Wachter (2007), and many others. The specifics of each of these studies vary, accommodating each time, place, and data resource, and, in may cases, seeking comparable pre-trends for leavers and stayers. We also tool the specifics of our approach to our context. Perhaps our most notable deviation from past methods is the choice of a two-year pre-displacement period of stable employment, rather than a four- or six-year period of stable employment. This choice is important to us for the following reason: younger workers' employment trajectories are characterized by higher turnover. A young worker with a six-year uninterrupted spell with a single employer is far from representative. In order to estimate job loss effects for young workers in comparison with mid-career and older workers, we have chosen to narrow the stable employment criterion to eight pre-displacement quarters, and thereby to estimate with a larger and more representative sample of younger workers.

Finally, we create five age groups of data, representing workers in their 20s, 30s, 40s, 50s, and 60s, for both the stable 2016-2019 period and the pandemic 2018-2021 period. We thus have ten separate mass layoff samples whose sizes are detailed in Table 1, consisting of about 150,000 individuals.

Table 2 reveals that there are significant differences in the demographic and financial characteristics of the young workers in their twenties in our samples before their job displacement. Most noticeably, in both pre-Covid and post-Covid periods, the treated groups have much smaller quarterly earnings (about $6,500 and $6,900) than their respective control groups (about $11,000 and $13,000). Some of these earnings differences are expected and are consistent with Jacobson et al. (1993), who find that displaced workers from mass-layoff firms start losing earnings even before their job losses. Nonetheless, Table 3 shows that young workers in the control and treated groups work in different industries: the treated workers are more concentrated in the industries with lower wages, such as administrative, support, food, and accommodations services. These descriptive statistics suggest substantial individual heterogeneity that systematically differs between the control and the treated groups. We account for these differences by reducing our baseline estimation samples to include only workers employed by the mass layoff firms, and by including a range of individual, industry, location, and time fixed effects in our empirical specifications.

3. Empirical Specification

Following the literature since Jacobson et al. (1993) on the effects of job displacements, we estimate the coefficients of the model

$$y_{ijt} = \alpha_i + \mu_{I(j)t} + \gamma_{lt} + X_{it}\beta + \sum_{k \neq -2} \delta^k D_{it}^k + \varepsilon_{ijt}, \tag{1}$$

where y_{ijt} is an employment or credit-related outcome for worker i in firm j in period t, α_i is an individual fixed effect, $\mu_{I(j)t}$ is an industry-quarter fixed effect, where industry $I(j)$ reflects the industry of worker i's primary employer j at time zero. γ_{lt} is a location l quarter-year fixed effect, X_{it} is a vector of indicators for worker i's age in quarter t, and D_{it}^k is an indicator that equals 1 if worker i separated from their job in period $t - k$, and equals 0 otherwise. We are most interested in the coefficients δ^k, which represent the average responses of workers k quarters after job loss, and which, in the mass layoff sample, are intended as event study estimates of the average causal effects of being k periods from job loss, where k = -4, …, +6.

In addition, we consider heterogeneous effects of job loss by demographic subgroups, for example by gender and family support status, by estimating the modified model

$$y_{ijt} = \alpha_i + \mu_{I(j)t} + \gamma_{lt} + X_{it}\beta + \sum_{k \neq -2} \sum_{g \in G} \delta^{k,g} d_i^g D_{it}^k + \varepsilon_{it}. \tag{2}$$

The differences between equations (1) and (2) are that, from equation (1) to equation (2), we replace δ^k with $\sum_{g \in G} \delta_g^k d_i^g$, where d_i^g is an indicator that equals 1 if worker i belongs to the group $g \in G$, and G is a set of mutually exclusive and exhaustive subsets of workers in the sample. We thus interpret the coefficient $\delta^{k,g} \delta_g^k$ as the average job loss response of workers at distance k from job loss in group g.

Like Jacobson et al. (1993), we limit our sample to workers at mass-layoff firms, whose reason for leaving the job is more likely the firms' distress and not the individual worker's volition, so it is reasonable to believe that the correlation between the individual error term ε_{ijt} and job losses is limited. In addition, we adopt one sample condition from Lachowska et al. (2020): we require that each sample worker has some employment recorded by the state unemployment system in each year following the layoff. In this manner, we ensure that sample treated workers have not simply left the state in response to the job loss.

It may help interpretation of the event study estimation figures to note the reason for our minor deviation from event study conventions regarding the assignment of the omitted quarter in this application. Our employment data interval is the quarter. Each quarter represents 13 work weeks. Job separation may take place at the beginning, middle, or end of a quarter. Therefore we observe, for example, some separations from stable employers that occur in week seven of the quarter and result in a data point of seven weeks worked. Our earnings measures are therefore smoothed somewhat through a job displacement event. We assign the displacement event to be the first quarter in which the worker has no earnings from the primary employer, and we label this quarter as $t = 0$. Because we implement a common, not staggered, event timing approach, with common displacement timing 2018Q2 in the stable economy sample and 2020Q2 in the pandemic sample, $t = 0$ belongs to the same calendar time for all sample members. However, time period $t = -1$ retains a meaningful amount of separation weeks that precede the first full quarter of separation from the primary employer. As a result, $y_{i,j,-1}$ may reflect early effects of the separation. This necessary smoothing in the observation of the displacement event leads us to fix quarter $t = -2$ as the omitted base quarter, against which all others are compared, in our event study estimation. Quarter $t = -2$ represents the last quarter of uninterrupted employment with the primary pre-displacement employer.

Along with these timing choices, we have chosen to center each (difference in differences) event study on a shared job loss quarter. As a result, we do not need to contend with the two-way fixed effect concerns that arise from staggered treatment timing, as described by Sun and Abraham (2021) and others.

4. Results

4.1 Unemployment Insurance

Estimation of equation (1) taking the various supports available to displaced workers as outcomes will give us an idea of the extent to which these common supports find workers in time of need, as well as which workers they find, during which stage of the unemployment process. Let us begin with unemployment insurance, the program most closely designed to meet displaced workers' needs. Figure 1 depicts estimates of expression (1) in which outcome y_{ijt} is defined as the share of each group of workers who are currently receiving UI benefits. Estimates are shown in Figure 1a for the event study in which the treated group separated from a previously stable job in 2018Q2, and Figure 1b for the event study in which treated workers separated in 2020Q2. The panels of each figure represent age subsamples: the first panel

is labeled "youth", and represents young workers ages 23-27, who are of particular interest as they have, by and large, left school and yet they remain in the earliest years of their careers. Beyond this, we represent estimates by decade: the second panel depicts all workers in their 20s, the next 30s, and so on through the final panel depicting workers in their 60s.

The difference by age group in the rate of successful take-up of unemployment insurance is striking. In Figure 1a, depicting pre-pandemic layoffs, workers in their twenties who have lost a job in a mass layoff are fourteen percentage points more likely to have applied for and currently receive unemployment benefits in quarters $k = -1$ and 0, in which most treated workers initially separate from their employers and then all treated workers are separated; they are eight percentage points more likely to do so in $k = 1$. Each of these point estimates differs significantly from zero at the five percent level or less. Nevertheless, in a sample constructed exclusively of Ohio unemployment insurance-covered workers who have worked continuously in covered jobs with a primary employer over the past year, and then separated from that employer as it undergoes a mass layoff event, eight or even fourteen percent is a startlingly low rate of unemployment insurance take-up. The rate at which benefits are claimed and awarded increases with each decadal age group until it reaches a peak among workers in their forties, who are estimated to be 32 and 34 percentage points more likely than continuing workers to receive UI benefits in quarters $k = -1$ and 0, respectively, and 20percentage points more likely in $k = 1$. Again these point estimates differ significantly from zero at or beyond the five percent level. Hence we see that middle aged workers are more than twice as likely as young workers successfully to access unemployment insurance in the event of covered job displacement; tests of the difference in pooled estimation following specification (2) reject the null hypothesis of identical UI effects of job loss for workers in their twenties and forties easily reject the null hypothesis of no difference at the five percent level. Estimates using UI benefit dollars received as the outcome in expression (1) only serve to expand the magnitude and significance of the gap between young and middle aged workers' UI receipt in response to job loss, given that displaced mid-career workers tend to have lost higher-paying jobs.[17]

The rate at which displaced workers both claim and are awarded UI benefits declines through the fifties to reach a low for workers in their sixties that is approaches the low rate of UI benefit receipt for workers in their twenties. Again, the difference between benefit receipt rates for workers in their forties and, this time, workers in their sixties is economically meaningful and significant at conventional levels.

---

[17] UI dollar amount estimates by age are available from the authors.

Displaced workers in their sixties are estimated to receive UI benefits approximately 19, 18, and 11 percentage points more often than non-displaced workers in k = -1, 0, and 1, a precipitous drop when compared with the 34 percentage point estimate for workers in their forties. In sum, we observe an inverted u-shape from younger to older ages in the estimated rate at which mass layoff worker displacement from long-held, UI-covered employment leads to UI benefit awards. Recalling the evidence of Lachowska et al. and of O'Leary et al, if workers are indeed taking up unemployment insurance at concerningly low rates, then our estimates based on Ohio workers suggest that the youngest and oldest displaced worker groups are contributing an outsized amount to the shortage of UI take-up.

Looking to the pandemic era, in which many more workers suffered job displacement, some features of this estimated age profile persist and some do not. While we find in Figure 1b that workers in their sixties are again less likely to claim and be awarded UI benefits, the difference in the pandemic era is quite modest. Further, in the pandemic estimates we find workers in their twenties to be approximately as likely as workers in their thirties, forties, and fifties to receive UI benefits; a displaced worker in each of these groups is approximately 15 percentage points more likely to receive UI benefits than an otherwise comparable continuing worker. The COVID pandemic, and associated shutdowns and layoffs, increased the size of the pool of the unemployed. The otherwise stably employed workers who were reached by these layoffs may have had little past reason to understand their UI protections, and this may have led to reduced UI take-up among all workers and especially among displaced middle-aged workers. Impressively, the unprecedented labor market conditions of the pandemic appear to have removed nearly all of the age gradient in UI take-up.

4.2 Lender Accommodations and Credit Card Borrowing

If younger and older workers are remarkably unlikely to weather a mass layoff job displacement with the help of UI benefits, what other supports do they find? Our rare data resource allows us to study government UI benefits, lender accommodations, and family support in a common sample and using parallel methods. Let us now turn to support for displaced workers arising from private lenders, in the form of both repayment accommodations and borrowing to fund ongoing (largely non-durable) consumption. We study forbearance only for the sample in which treated workers are displaced in 202Q2, as these programs arose to accommodate pandemic financial hardships and few similar opportunities existed in the pre-pandemic period. Figure 2 shows us the same expression (1) event study estimated with

pandemic-era lender forbearance of auto and housing debt loan repayments for the sample in which treated workers separated from employment in 2020Q2.[18]

As in the case of UI benefits, we find that the estimated effect of job displacement on the rate of forbearance receipt follows an inverted u-shape with worker age. Where workers in their twenties have a peak response of the rate of forbearance to job loss of 0.5 percentage points in quarter $k = 1$, workers in their forties show a peak 1.4 percentage point increase in forbearance (in $k = 0$) in response to job loss. While the forbearance response to job loss for workers in their forties is significant at the five percent level for each of $k = 0$ through 5, the point estimates for workers in their twenties are generally small and never reach significance at conventional levels. Advancing through the worker age groups, again we see the reliance on support for displaced workers, here forbearance, decrease until it reaches a symmetric low point among workers in their sixties. In sum, both UI benefit and forbearance receipt in response to job loss are quite limited among the youngest and oldest displaced workers, while they reach their peak with economically substantial and statistically significant UI benefit and forbearance responses to job loss among middle aged workers.

The fact that the increase in middle aged workers' reliance on auto and housing debt forbearance in response to job loss is greater than that of younger and older workers may not be surprising, given that middle age is the time of peak mortgage borrowing in the US, and fairly high auto borrowing. One thing that we do learn from the Figure 2 estimates is that, although forbearance could have gone to any subgroup of borrowers, pandemic-era lender forbearance did differentially find displaced workers, particularly middle aged displaced workers. Though the peak differential of 1.4 percentage points for displaced versus continuing workers in their 40s appears modest, it is economically meaningful when compared to the prevalence of pandemic-era lender forbearance. Sanchez and Wilkinson (2022), for example, find that a cumulative share of 16 percent of mortgage holders participated in pandemic mortgage forbearance in 2020 and 2021; these participants typically used forbearance for three or fewer months. Another thing that we learn is that lender accommodation accounts for the unemployment consumption needs of at most one in two hundred young workers.

---

[18] We omit lender accommodations of student loan repayment because all US direct federal student loans benefitted from a payment pause without qualification or application, and 90 percent of the US student loan market is federal. Including student loans in our lender accommodations measure would lead to an inference of widespread loan accommodation among workers in their 20s and 30s.

Thinking again of the role of private lenders in supporting workers through job loss, we look now to Figure 3, which reports the estimated effect of job loss, following specification (1), on displaced workers' credit card debt, again across five decadal age samples and again during the stable pre-pandemic and the pandemic period. If workers are able to access pre-existing revolving lines of credit to support consumption through job displacement, then this may allow them to avoid seeking UI benefits and lender accommodations in order to sustain consumption in the face of lost income. For example, workers in their twenties or sixties relying substantially on increased credit card borrowing in response to job loss could account for their failure to secure unemployment benefits and lender accommodations in response to displacement. We estimate the dependence of the inverse hyperbolic sine of credit card debt on layoff following specification (1), in order to understand the proportional response of debt while also accommodating the (often small) minority of credit fileholders in each age group who begin with no credit card debt.

The estimates in Figure 3 do not support the possibility that young, displaced workers make up for limited UI benefits and lender accommodations by borrowing on credit cards (or reducing card repayment). In the pre-pandemic period, workers in their twenties respond to displacement with far greater (proportional) declines in their credit card balances than those in other age groups. The 2018Q2 job loss event study generates a significant decline in credit card debt for workers in their twenties in response to job loss that grows to a roughly 90 percent decline in card balances by five quarters beyond separation. In contrast, displaced workers in their forties respond with an approximate 40 percent decline in credit card debt, and those in their fifties show no significant or substantial decline in card debt at all. Finally, we note that estimates of the response of credit card debt to layoff during the pandemic are small and insignificant for all age groups and across almost every event study period.[19] This may reflect the relative absence of both income and spending opportunities during this unprecedented time. No age group in either time period responds to job loss with increased credit card debt, indicating that credit card borrowing does not function as a meaningful source of consumption support through unemployment for the average worker in any of our estimation samples.

4.3 Family Sources of Support for Younger Workers

---

[19] Estimates of the response of the IHS of credit card debt to job loss for our decadal age groups are not reported among the main text figures, as they are uneventful. They are, however, available from the authors.

If the various estimates of expression (1) indicate that younger displaced workers rely very little on unemployment insurance, lender forbearance, or credit card borrowing to sustain consumption through unemployment, then how do they weather the income loss of unemployment? Older workers' limited recourse to government and lender supports in response to job loss may be rationalized by reliance on greater savings accumulated by the late career, as well as the possibility of claiming any accumulated retirement benefits by choosing to retire earlier than planned. Younger workers typically lack such options. Many do, however, retain supportive financial connections with their extended families that mid- and late-career workers lack. Given our failure to uncover meaningful government or private sector support drawn by young, displaced workers in response to job loss, we next investigate family support for displaced young workers.

While no data resource offers comprehensive coverage of the means by which extended families help their members through financial strife, our rare data on the work, financial lives, and household structures of 20 percent of adult Ohio workers offers some insight into the role of the extended family in supporting displaced young workers, in novel conjunction with both government and lender resources. As a part of this exercise, we have generated two measures of family support for young workers. First, as above, we consider whether the young adult lives with a household member who is 15 to 45 years older. We interpret this household composition as evidence of intergenerational co-residence with a parent or similar elder, and, for workers in their twenties, we rely on existing research indicating that such arrangements predominantly benefit the younger co-resident.[20] Second, we use proprietary methods in the Experian data to track account sharing. We identify young adults who do and do not share credit accounts with account donors 15 to 45 years older. These accounts are authorized user accounts (AUAs), established based on the measured creditworthiness of the elder account donor and requiring repayment of the account originator but not of its beneficiary. Examples of authorized user accounts are credit card accounts shared by parents and children, merchant accounts for gas station chains, and various other revolving accounts. With these measures in hand, we split our sample of workers in their 20s into those who do and do not co-reside with elders, and those who do and do not benefit from AUAs donated by elders.

Figure 4 reports estimates of the rate at which younger workers in their twenties who live independently in quarter $k = -2$ move into intergenerational households with parents or similar elders who are 15 to 45 years their senior in response to job displacement. In contrast to the empirical results of

---

[20] See Bleemer et al. (2024) and Dettling and Hsu (2018) for evidence on the inference of household members' relationships from the age distribution of household members.

Kaplan (2012), we find no clear evidence that displaced younger workers who were living independently move home to parents or similar elders at a higher rate in response to job loss, during either the pre-pandemic or pandemic period. Moreover, Figure 5 reports the results of an analogous exercise comparing the rates of transition into AUA recipiency in response to job loss; again, we find no clear evidence of the emergence of AUA accounts provided by elders in response to job loss. It may be helpful to recall at this point that roughly half of our twenty-something workers share an address, down to any apartment number, with a parent or elder 15 to 45 years their senior. While we fail to identify a co-residence transition response to job loss, we observe a population of young workers in which roughly half live in intergenerational households. The young workers living in intergenerational households both before and after job loss may, nevertheless, receive increased support from parents or similar elders as a result of the job loss.

We next ask whether it is the specific youth who benefit from family support that also fail to take up available UI benefits and even lender forbearance in the event of job loss. Motivated by the above facts of our dataset, we estimate UI take-up following job loss separately for the roughly half of our 20s sample who live with elders and the half who do not, using specification (2). Figure 6 reports the resulting estimates. In the stable pre-pandemic period, we estimate that twenty-something intergenerational co-residents who experience displacement are 10 percentage points more likely to receive UI benefits in quarter $k = 0$. Non-co-residents, on the other hand, are 19 percentage points more likely to receive UI benefits as a result of job displacement. We should note that the difference between the two job loss UI response rates is significant only at the 10 percent level. This nine percentage point difference in the share of younger workers who receive UI benefits in response to job loss between the approximate half of the sample who co-reside and the approximate half who do not co-reside goes a long way toward explaining the difference between the low rate of UI benefit receipt among our younger workers, of 14 percent, and the higher rate of UI benefit receipt among our middle aged workers, of 34 percent. Younger workers who live with parents or similar elders are substantially less likely to turn to public benefits during unemployment. Hence, young adults with family support are indeed the specific youth who least rely on UI benefits following displacement. This pattern suggests that younger workers who enjoy family support may be responsible for a meaningful portion of the under-claiming of UI benefits in the event of (UI-covered) job loss that we estimate among younger workers.[21]

---

[21] Estimates available from the authors make the analogous comparison between AUA beneficiaries and non-beneficiaries. In this case, we do not find a significant difference in UI benefit receipt between those who do and do not benefit from

4.4 Recovery

Finally, we look to data on the employment, earnings, and financial recovery of the displaced worker to answer two remaining questions: First, younger workers are estimated to draw roughly half as much UI benefits in response to job loss as middle aged workers. The possibility remains that younger workers fail to take up unemployment insurance benefits because they replace their lost jobs more quickly, and therefore they do not require (or qualify for) UI benefits at a comparable rate to that of middle aged workers. This re-employment differential seems particularly plausible given that younger workers earn lower salaries, and lower paying jobs may be easier to replace than higher paying jobs. In addition, if less experienced younger workers are also less aware of their UI coverage, then they may feel more financially constrained in their search for a new job, and may take a lower paying job sooner than a more experienced worker, with full knowledge of the UI system might. As a result, we use data on employment and earnings recovery to ask whether younger workers return to work more quickly, at lower paying jobs, potentially explaining their low UI benefit take-up.

Second, we ask the broader related question: given displaced workers' reliance on the assortment of supports described above, and the estimated successes and failures of public unemployment insurance, private lender responses, and family contributions to meet their needs, how completely do members of our various displaced worker age groups recover from job loss?

We measure recovery in terms of re-employment, the log of earnings within the quarter conditional on returning to employment, and the Vantage credit risk score, as a summary statistic for financial stability. In Figure 7, we find that workers in their twenties through forties achieve very similar re-employment rates six quarters after a 2018Q2 displacement, and that their return to employment progresses at very similar rates in every quarter along the way. This finding suggests that younger workers' far lower rates of UI benefit claiming are not well explained by a speedier return to employment.

Returning to our second question, the broader comparison of career recovery by age group, we note that only workers in their fifties and, especially, sixties suffer more substantial continued non-employment following job loss. Employment recovery estimates are particularly bleak for the 2018Q2 displaced workers in their sixties, with persistent employment declines caused by 2018Q2 displacement of roughly 25 percent. During the pandemic, however, employment losses are both sudden and short-lived. All

---

family support. It is worth noting that AUAs provided by elders are comparatively rare, and so this distinction did not have a similar opportunity to explain large differences in young workers' UI benefit take-up.

workers in their twenties through fifties display similar re-employment outcomes, with persistent employment losses on the order of ten percent, while workers in their sixties suffer persistent employment loss caused by 2020Q2 job displacement on the order of fifteen percent. By and large, our re-employment estimates indicate that early- and mid-career workers recover employment rates similarly, while older workers suffer persistent and large employment declines in response to job displacement.

Earnings recovery, reported in Figure 8a-b, displays a flat and then negative gradient with age. Figure 8a-b reports estimates of expression (1) across the decades of age, in which the outcome is the log of earnings conditional on having positive earnings (and hence, among the treated, conditional on having returned to work). We find that workers in their twenties, thirties, and forties who were displaced in 2018Q2 recover 70 to 75 percent of their pre-displacement earnings, conditional on returning to work. Workers in their fifties and sixties, however, display a meaningfully lower share of earnings recovered, conditional on returning to work, with both experiencing a persistent fifty percent or greater decline in even conditional earnings in response to job displacement in 2018Q2. The pandemic displacement again behaves quite differently: estimated earnings recovery reaches about 90 percent for workers in their twenties through fifties, which is consistent with evidence that this was a sudden and short-lived disruption. Only the workers in their sixties are left with an approximate twenty percent decline in conditional earnings in response to the pandemic job displacement.

Credit score losses and recoveries in response to the mass layoff are one way of summarizing the financial fallout from job loss experienced by our younger, middle aged, and older workers. In Figure 9, describing credit score responses to the 2018Q2 layoffs, we estimate that workers in their 20s experience rapid and large credit damage following job loss, peaking at a mean credit score decline of 17 points after four quarters. Displaced workers in their thirties, forties, and fifties suffer much smaller peak credit score losses of 7, 9, and 7 points, respectively. While workers in their twenties through forties do show some improvement following peak credit score damage, ending in final score declines after six quarters of 13, 5, and 7, respectively, the older workers in their fifties and sixties are notable in that their credit score decline following layoff is monotonic, with the final score decline six quarters out being the greatest; by the end of our estimation window, workers in their fifties have suffered a significant seven point decline, and workers in their sixties have suffered a significant 14 point decline.

On the other hand, credit scores show very little response to job displacement in any age group during the pandemic, suggesting that various public pandemic supports and private lender accommodations were sufficient to protect most workers from damage to credit profiles resulting from the pandemic.

Pre-trends are worth noting among the recovery estimates. Employment is a sample criterion and therefore its pre-trends are uninformative. However, we can track pre-trends in the differences between displaced and continuing workers/ outcomes, conditional on specification (1) controls, as an indication of the success of our mass layoff methodology in generating comparable treatment and control workers, holding other specified worker characteristics fixed. Estimated pre-trends in conditional log earnings, unemployment insurance receipt and amount, credit card borrowing, forbearance, and credit scores all indicate close comparability of our treatment and control. The one exception in terms of comparable pre-trends comes in the case of the rate of intergenerational co-residence for continuing and displaced workers one year before the job displacement in the pre-pandemic sample. This point estimate does suggest that a greater share of soon-to-be displaced workers lived with parents or similar elders, though this was not the case two years before the mass layoff. By and large, our controls, including time-varying industry and location effects, and our sample conditioning, including requiring displaced workers to return to the state of Ohio employment data at some point post-layoff, appear to have created closely comparable treatment and control groups.

Summarizing the recovery findings: we see no suggestion in the work recovery estimates that younger workers avoid UI benefits as a result of faster return to employment, or that naïve younger workers, unaware of their available UI benefits, search more briefly while applying lower reservation standards, and therefore return to lower paying jobs too quickly to draw UI benefits. Instead, younger workers return to employment at similar speeds to middle aged workers, and they recover their past earnings levels more completely than any other age group. We observe younger workers relying less on all categories of support than their mid-career counterparts, and even decreasing spending from credit more than any other age group; the only suggestion we uncover of younger workers' source of support through unemployment is the differential in UI benefit claiming between younger workers living with parents and not living with parents. Strikingly, in the face of their estimated resource deficit, younger workers make the most complete career recovery from the mass layoff. However, alongside workers in their sixties, they suffer the greatest financial stability setback.

Older workers' estimates also betray minimal evidence of reliance on outside support following job loss. Displaced workers in their sixties are estimated to be relatively unlikely to turn to unemployment insurance or to lender forbearance in response to job loss. They also do not increase credit card borrowing following job loss. Despite, or because of, their relative independence in the face of job loss, older workers demonstrate the largest and most persistent setbacks in employment, conditional earnings, and financial

stability six quarters after a job displacement. Both younger and older workers are estimated to contribute meaningfully to the unemployment insurance under-claiming phenomenon that motivate this paper, and both suffer large credit score declines six quarters after job loss. Finally, middle aged workers are not among our UI under-claimers. They source job displacement support most broadly, relying more than twice as much as the youngest and oldest workers on UI benefits and lender accommodations, and they achieve an intermediate level of recovery from job displacement after six quarters.

5. Discussion

In this paper, we investigate the manners in which displaced workers' reliance on public support, in the form of state unemployment insurance, private sector resources, including new borrowing and deferred or delinquent repayment of debts, and family support, observed as intergenerational co-residence and credit account sharing, varies with the worker's career stage. Owing to the observed assortment of supports for each age group, we then examine the extent to which early-, mid-, and late-career workers recover lost employment, earnings, and financial stability six quarters after job displacement.

We use the Ohio State University Consumer Credit Panel (OSU-CCP) matched to the 20 percent sample of adult Ohioans who work in state unemployment insurance system-covered jobs and have credit reports to track UI benefit receipt, borrowing, forbearance, and measured creditworthiness through job loss. We have built this near-comprehensive data resource on work, household finance, and household and extended family networks in collaboration with Experian, the OLDA, ODJFS, and CHRR. Owing to the size and coverage of this rare data resource, we are able to estimate the pattern of government, lender, and family supports that carry displaced workers through the job loss experience, along with the extent of workers recovery of employment, earnings, and financial stability for decadal age subsamples, and to identify these patterns at a quarterly frequency around job loss in decadal age samples with notable precision.

For the same workers, we use our unusually rich data on networks of Ohioans to investigate the extent to which younger displaced workers turn to their elders for support through job loss, along with the extent to which such reliance substitutes for, or displaces, more traditional government benefits and lender credit and accommodations. Finally, these three categories of support, taken together, underlie the extent of employment and financial recovery that we observe among early-, mid-, and late-career displaced workers through the first six quarters following displacement. In order to understand the

effectiveness of each age group's estimated sources of support, we estimate the extent of each age group's recovery from job loss in terms of re-employment, conditional earnings, and credit score. These results tell us the degrees to which the differing combinations of unemployment supports gathered by young, middle aged, and older displaced workers are successful in generating complete and remunerative re-employment and financial stability a year and a half after the initial displacement.

We rely on standard mass layoff methods, exploiting anonymized employer identifiers and modifying standard practices to suit our application and data resources, to estimate what we argue to be causal effects of job displacement on UI benefit receipt, lender forbearance, credit card borrowing, family support via intergenerational co-residence and shared AUAs, and recovery as measured using re-employment, conditional earnings, and credit scores.

Our estimates imply that the under-claiming of UI benefits among displaced eligible workers noted by the recent literature is driven largely by workers in their twenties and sixties. Younger workers draw very little support for unemployment from traditional sources, including the unemployment insurance system and lender accommodations, and they even substantially decrease credit card borrowing. We do see that the particular young workers who live with parents or similar elders are the ones who rely least on UI benefits in the event of job loss, and the magnitude of this difference, alongside the prevalence of intergenerational living among young workers, goes some distance toward rationalizing the low rate of claiming among the young. Putting all of this together, workers in their twenties recover most completely from job loss in terms of their careers, but they suffer persistent credit score setbacks six quarters after job loss.

Workers in their thirties and forties rely heavily on UI benefits and lender accommodations to weather job loss; they are not primary drivers of UI under-claiming. They make moderately successful career recoveries, and they show little evidence of financial damage six quarters after job loss.

Older workers are estimated to handle the income loss of job displacement most independently, with displaced workers in their sixties relying little in UI benefits and lender accommodations, and not increasing borrowing despite strong ex ante credit access. They also bear the greatest hardship as a result of mass layoff, with displaced workers in their sixties recovering only 75 percent of employment, less than half of their prior earnings even conditional on employment, and suffering an average of a 14 point credit score decline six quarters after the job loss.

These findings may point to an opportunity for connecting very early- and late-career workers with effective UI benefits, thereby sparing both younger and older workers the financial damage from

job loss that we have estimated in this study, as well as the extensive career damage experienced by workers in their sixties, and, to a lesser extent, their fifties following an unanticipated layoff. At the same time, policy inference based on the above connections between the sources of support and the success of recovery of displaced workers at various stages of the life cycle will depend crucially on whether missed opportunities for support arise from information limitations or optimizing choices made by fully informed workers at the time of job loss. Do younger and older workers leave extensive UI benefits on the table out of a lack of knowledge of their benefit eligibility? Or are they motivated by factors such as perceived stigma or inconvenience? Finally, our analysis leaves unanswered the question of how serious, or perhaps limited, the welfare consequences of older workers' lack of outside supports for job loss, and their weak recovery in terms of employment, earnings, and credit score, may be for the present older generation, who, on average, enjoy outsized wealth and access to borrowing when compared with both past cohorts of retirees and their current young contemporaries (Collins et al., Brown et al., Lusardi et al.).

References

Aaronson, Daniel, Sumit Agarwal, Julie L. Hotchkiss, and Taylor Kelley. "Job displacement and financial outcomes." *Economics letters* 177 (2019): 18-21.

Ananat, Elizabeth Oltmans, Anna Gassman-Pines, Dania V. Francis, and Christina M. Gibson-Davis. *Children left behind: The effects of statewide job loss on student achievement*. No. w17104. National Bureau of Economic Research, 2011.

Athreya, Kartik, Xuan S. Tam, and Eric R. Young (2012): "A Quantitative Theory of Information and Unsecured Credit," American Economic Journal: Macroeconomics, 4, 153–183.

Bell, Brian, Anna Bindler, and Stephen Machin. "Crime scars: recessions and the making of career criminals." *Review of Economics and Statistics* 100.3 (2018): 392-404.

Blattner, Laura, Jacob Hartwig, and Scott Nelson (2022): "Information Design in Consumer Credit Markets," Working paper.

Bleemer, Zachary, Meta Brown, Donghoon Lee, and Wilbert van der Klaauw. "Less debt, more co-residence: US families' changing responses to rising college tuition." Federal Reserve Bank of New York Staff report no. 700 (2024).

Braxton, J. Carter, Kyle F. Herkenhoff, and Gordon M. Phillips (2020): "Can the Unemployed Borrow? Implications for Public Insurance," Working Paper 27026, National Bureau of Economic Research.

Brown, Meta, Donghoon Lee, Joelle Scally, and Wilbert van der Klaauw. "The Graying of American Debt." *Remaking Retirement* (2020): 35-59.

Bubonya, Melisa, Deborah A. Cobb-Clark, and Mark Wooden. "Job loss and the mental health of spouses and adolescent children." *IZA Journal of Labor Economics* 6 (2017): 1-27.

Chan, Sewin, and Ann Huff Stevens. "Employment and retirement following a late-career job loss." *American Economic Review* 89.2 (1999): 211-216.

Chatterjee, Satyajit, Dean Corbae, Kyle Dempsey, and José-Víctor Ríos-Rull. "A quantitative theory of the credit score." *Econometrica* 91, no. 5 (2023): 1803-1840.

Collins, J. Michael, John Karl Scholz, and Ananth Seshadri. "The assets and liabilities of cohorts: the antecedents of retirement security." *Michigan Retirement Research Center Research Paper* 2013-296 (2013).

Couch, Kenneth A., and Dana W. Placzek. "Earnings losses of displaced workers revisited." *American Economic Review* 100, no. 1 (2010): 572-589.

Dempsey, Kyle, and Anamaria Felicia Ionescu. "Lending standards and borrowing premia in unsecured credit markets." (2021).

Dettling, Lisa J., and Joanne W. Hsu. "Returning to the nest: Debt and parental co-residence among young adults." *Labour Economics* 54 (2018): 225-236.

Eliason, Marcus, and Donald Storrie. "Lasting or latent scars? Swedish evidence on the long-term effects of job displacement." *Journal of Labor Economics* 24.4 (2006): 831-856.

Flaaen, Aaron, Matthew D. Shapiro, and Isaac Sorkin. "Reconsidering the consequences of worker displacements: Firm versus worker perspective." *American Economic Journal: Macroeconomics* 11, no. 2 (2019): 193-227.

Garin, Andrew, Emilie Jackson, and Dmitri Koustas. *New gig work or changes in reporting?: Understanding self-employment trends in tax data*. No. 278. OECD Publishing, 2022.

Garin, Andrew, Emilie Jackson, and Dmitri Koustas. "Is gig work changing the labor market? Key lessons from tax data." *National Tax Journal* 75, no. 4 (2022): 791-816.

Heisig, Jan Paul, and Jonas Radl. "Adding scars to wrinkles? Long-run effects of late-career job loss on retirement behavior and personal income." *Work, Aging and Retirement* 3.3 (2017): 257-272.

Hetschko, Clemens, Andreas Knabe, and Ronnie Schöb. "Looking back in anger? Retirement and unemployment scarring." *Demography* 56.3 (2019): 1105-1129.

Hilger, Nathaniel G. "Parental job loss and children's long-term outcomes: Evidence from 7 million fathers' layoffs." *American Economic Journal: Applied Economics* 8, no. 3 (2016): 247-283.

Huckfeldt, Christopher. "Understanding the scarring effect of recessions." *American Economic Review* 112.4 (2022): 1273-1310.

Jarosch, Gregor. "Searching for job security and the consequences of job loss." *Econometrica* 91.3 (2023): 903-942.

Kalil, Ariel, and Patrick Wightman. "Parental job loss and children's educational attainment in Black and White middle-class families." *Social Science Quarterly* 92, no. 1 (2011): 57-78.

Kaplan, Greg. "Moving back home: Insurance against labor market risk." *Journal of Political Economy* 120, no. 3 (2012): 446-512.

Keys, Benjamin (2018), The Credit Market Consequences of Job Displacement, Review of Economics and Statistics, *Review of Economics and Statistics*, 100 (3), pp. 405-415.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan. "Earnings losses of displaced workers." *The American economic review* (1993): 685-709.

Jacobson, Louis, Robert LaLonde, and Daniel G. Sullivan. "Estimating the returns to community college schooling for displaced workers." *Journal of Econometrics* 125, no. 1-2 (2005): 271-304.

Lachowska, Marta, Alexandre Mas, and Stephen A. Woodbury. "Sources of displaced workers' long-term earnings losses." *American Economic Review* 110, no. 10 (2020): 3231-3266.

Lachowska, Marta, Isaac Sorkin, and Stephen A. Woodbury. *Firms and unemployment insurance take-up*. No. w30266. National Bureau of Economic Research, 2022.

Lammers, Marloes, Hans Bloemen, and Stefan Hochguertel. "Job search requirements for older unemployed: Transitions to employment, early retirement and disability benefits." *European Economic Review* 58 (2013): 31-57.

Lusardi, Annamaria, Olivia S. Mitchell, and Noemi Oggero. "Debt and financial vulnerability on the verge of retirement." *Journal of Money, Credit and Banking* 52, no. 5 (2020): 1005-1034.

O'Leary, Christopher J., Kenneth J. Kline, Thomas A. Stengle, and Stephen A. Wandner. *Why are unemployment insurance claims so low?*. No. 23-383. Upjohn Institute Working Paper, 2023.

Rege, Mari, Kjetil Telle, and Mark Votruba. "Parental job loss and children's school performance." *The Review of Economic Studies* 78, no. 4 (2011): 1462-1489.

Ruhm, Christopher J. "Are workers permanently scarred by job displacements?." *The American economic review* 81.1 (1991): 319-324.

Sánchez, Juan M., and Olivia Wilkinson. *Forbearance during COVID-19: How Many Borrowers Used It, and for How Long?*. Federal Reserve Bank of St. Louis, 2022.

Schaller, Jessamyn, and Mariana Zerpa. "Short-run effects of parental job loss on child health." *American Journal of Health Economics* 5, no. 1 (2019): 8-41.

Schmillen, Achim, and Matthias Umkehrer. "The scars of youth: Effects of early-career unemployment on future unemployment experience." *International Labour Review* 156.3-4 (2017): 465-494.

Sullivan, Daniel G., and Till M. von Wachter. "Mortality, mass-Layoffs, and career outcomes: An analysis using administrative data." (2007).

Sun, Liyang, and Sarah Abraham. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects." *Journal of econometrics* 225, no. 2 (2021): 175-199.

Tatsiramos, Konstantinos. "Job displacement and the transitions to re-employment and early retirement for non-employed older workers." *European Economic Review* 54.4 (2010): 517-535.

Figures

Figure 1a. Unemployment insurance receipt by age group around 2018Q2 mass layoff
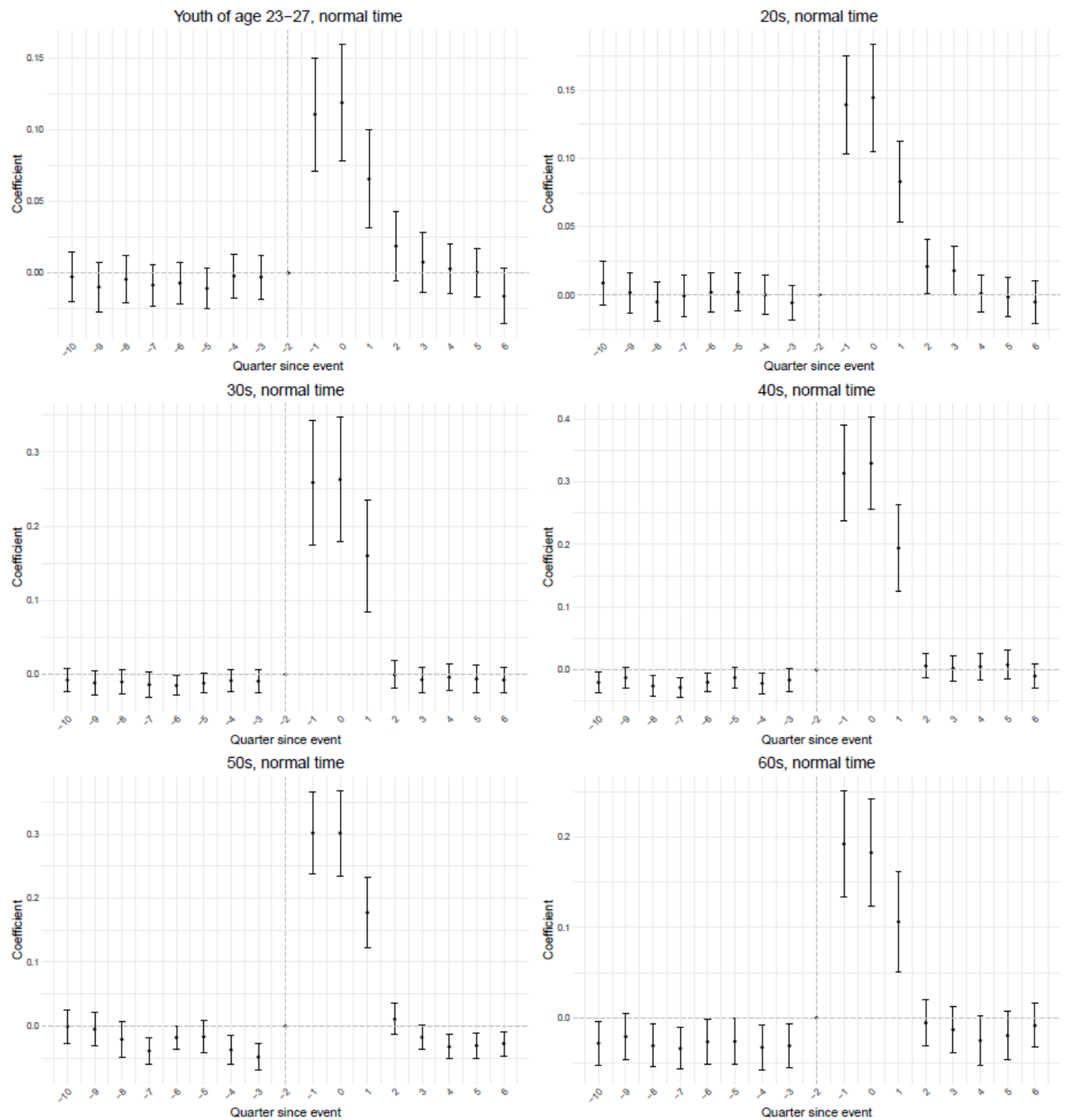Difference in differences event study estimates based on expression (1)

Figure 1b. Unemployment insurance qualification by age group around 2020Q2 mass layoff
Difference in differences event study estimates based on expression (1)

Figure 2. Pandemic lender accommodations by age group after 2020Q2 mass layoff
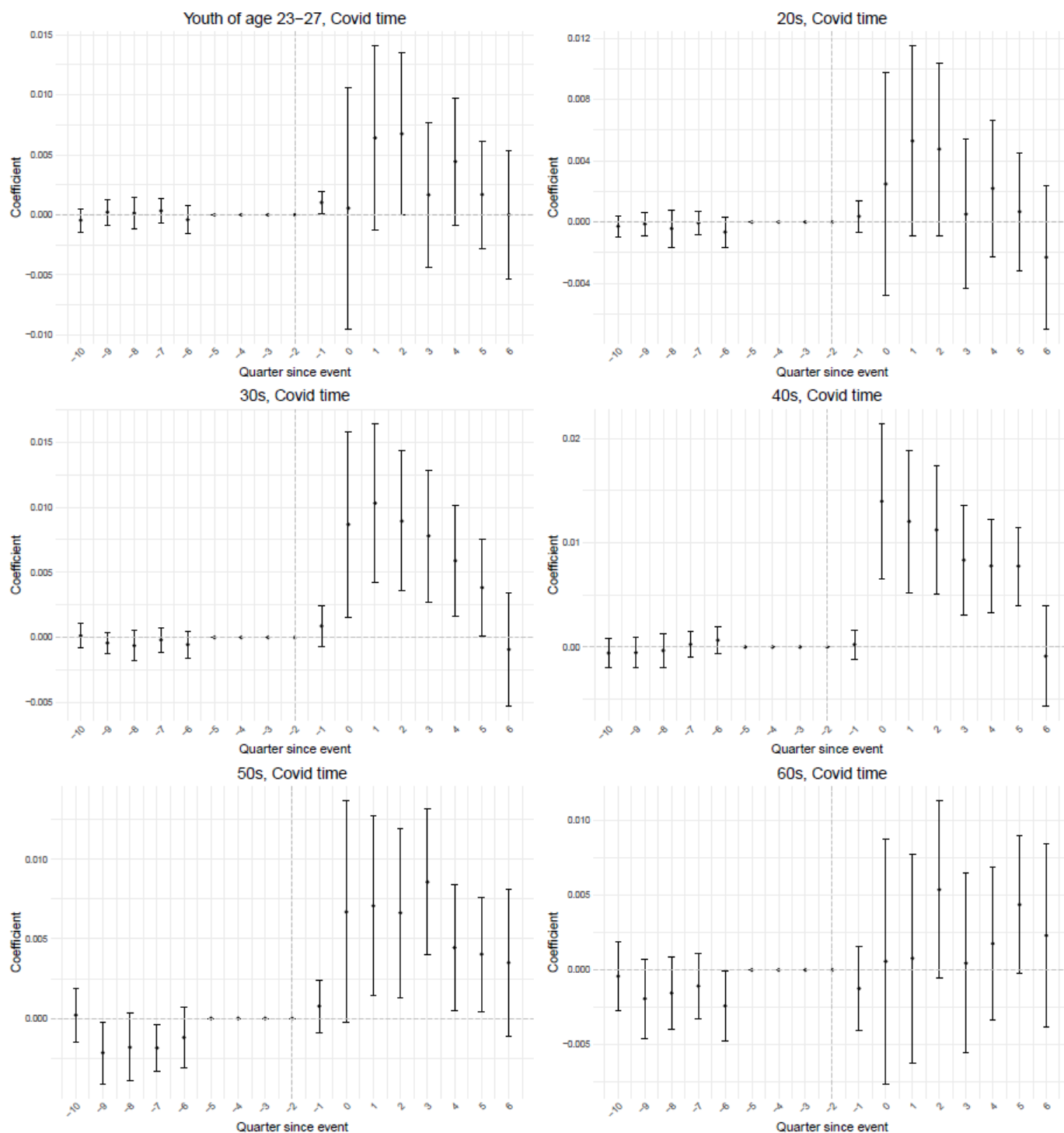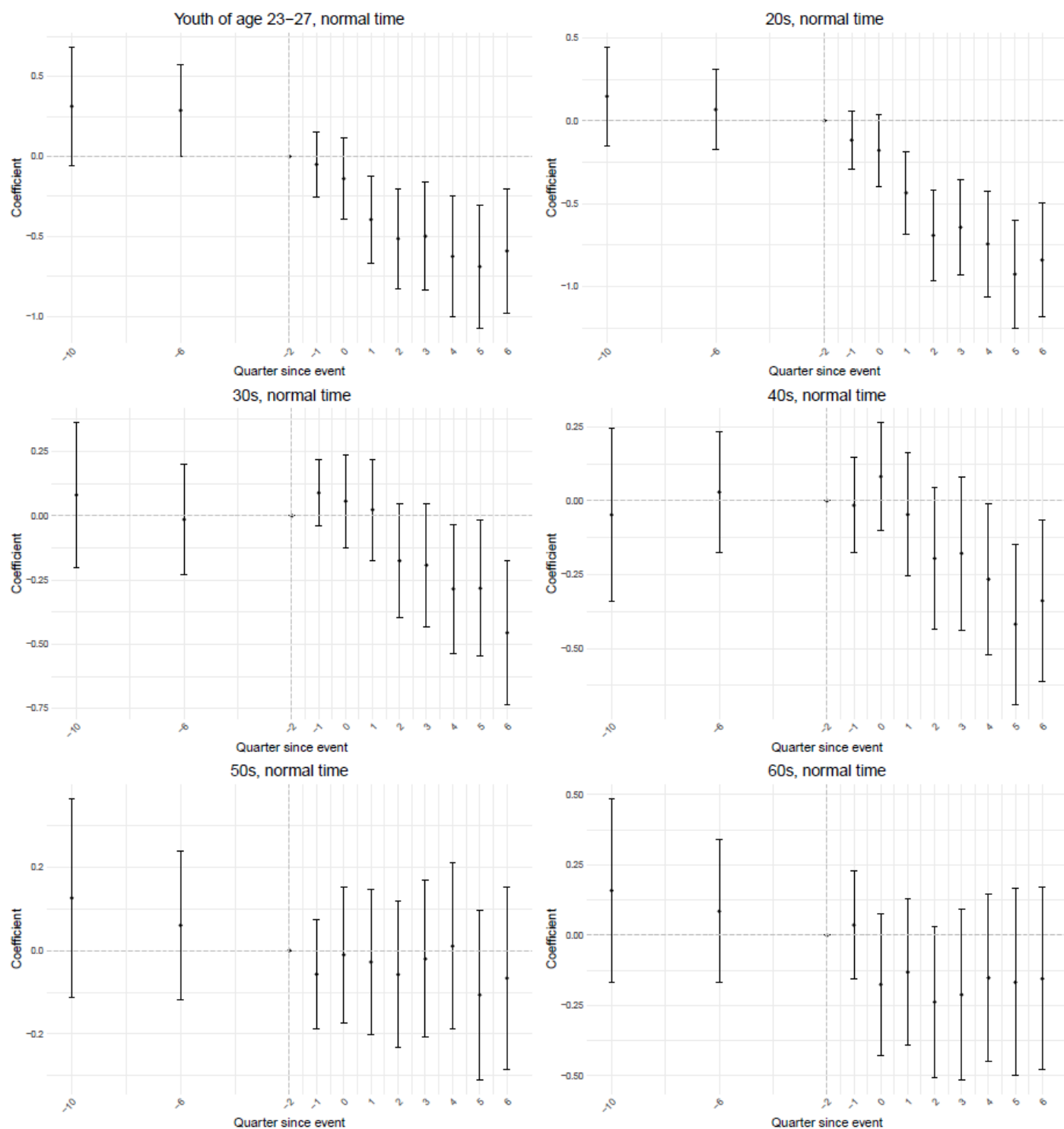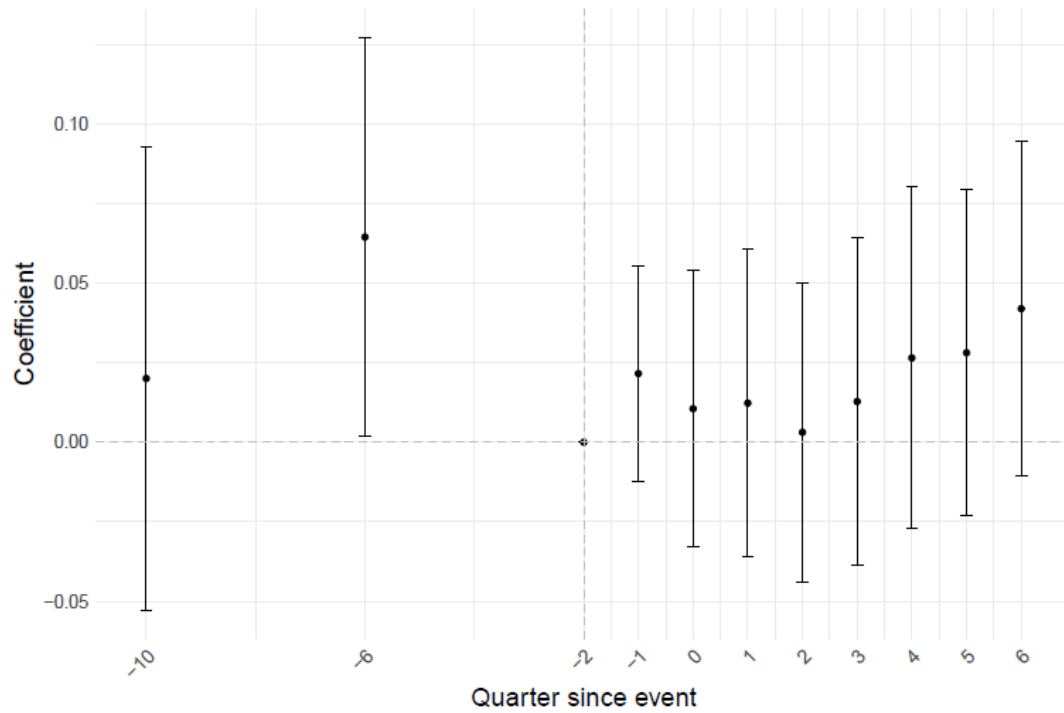Difference in differences event study estimates based on expression (1)

Figure 3. Credit card balance estimates by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

Figure 4. 20s workers' rate of moving to intergenerational co-residence after 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)
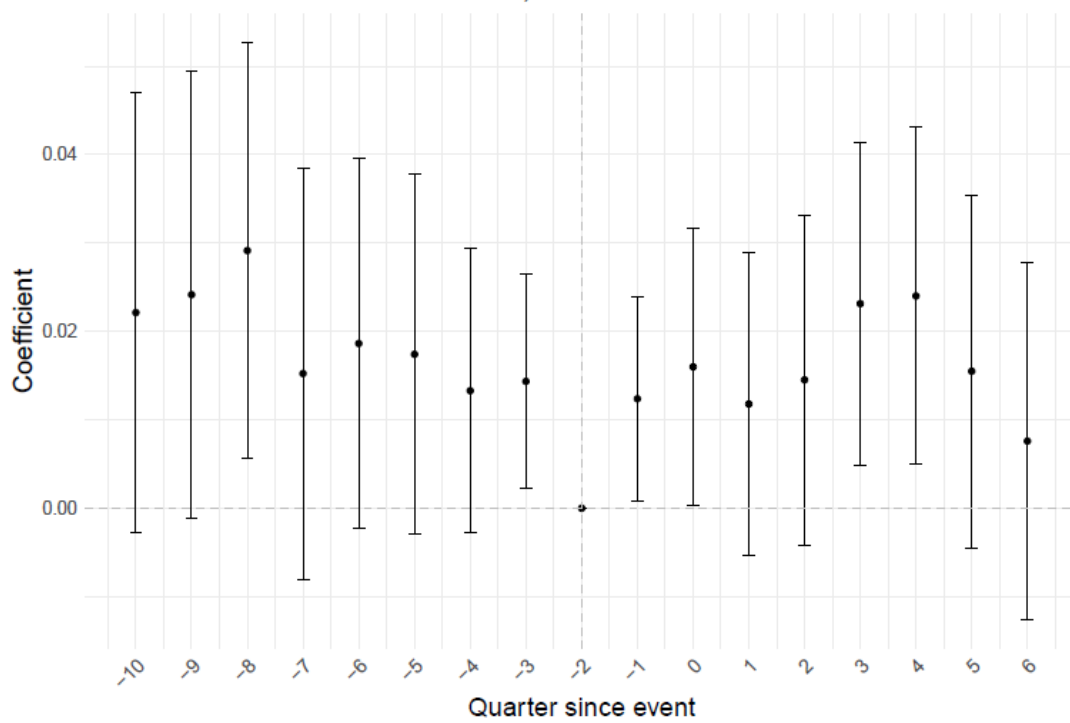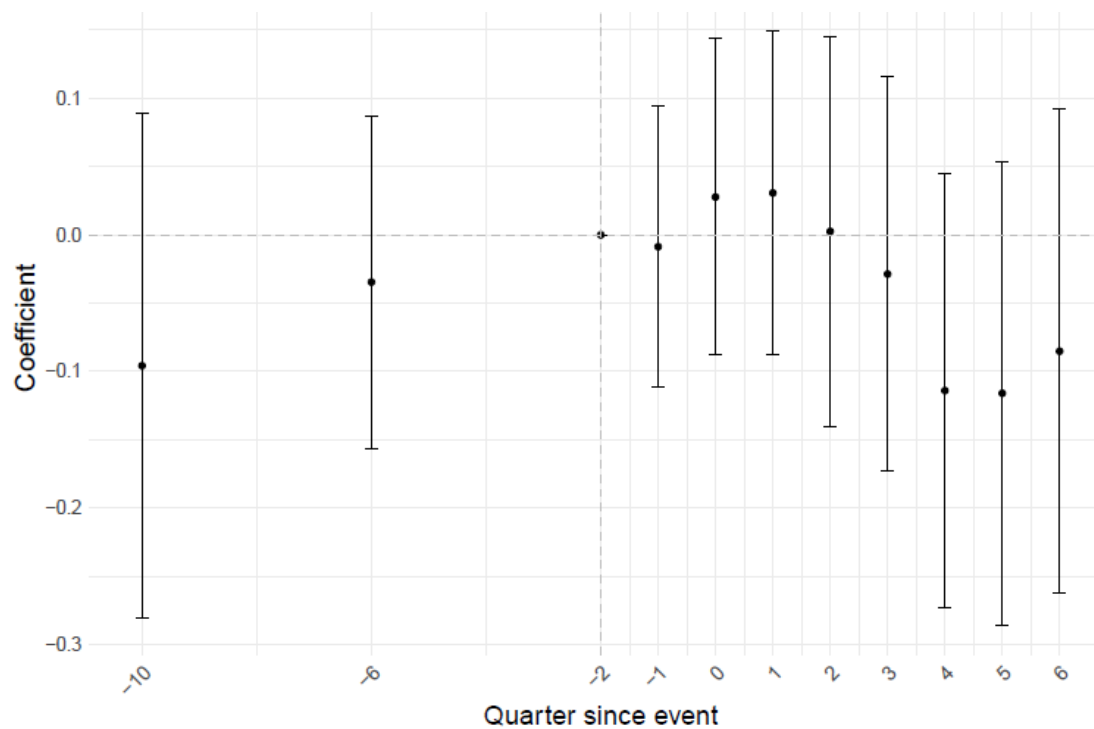
Panel A.

Panel B.

Figure 5. 20s workers' rate of becoming AUA beneficiary after 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)
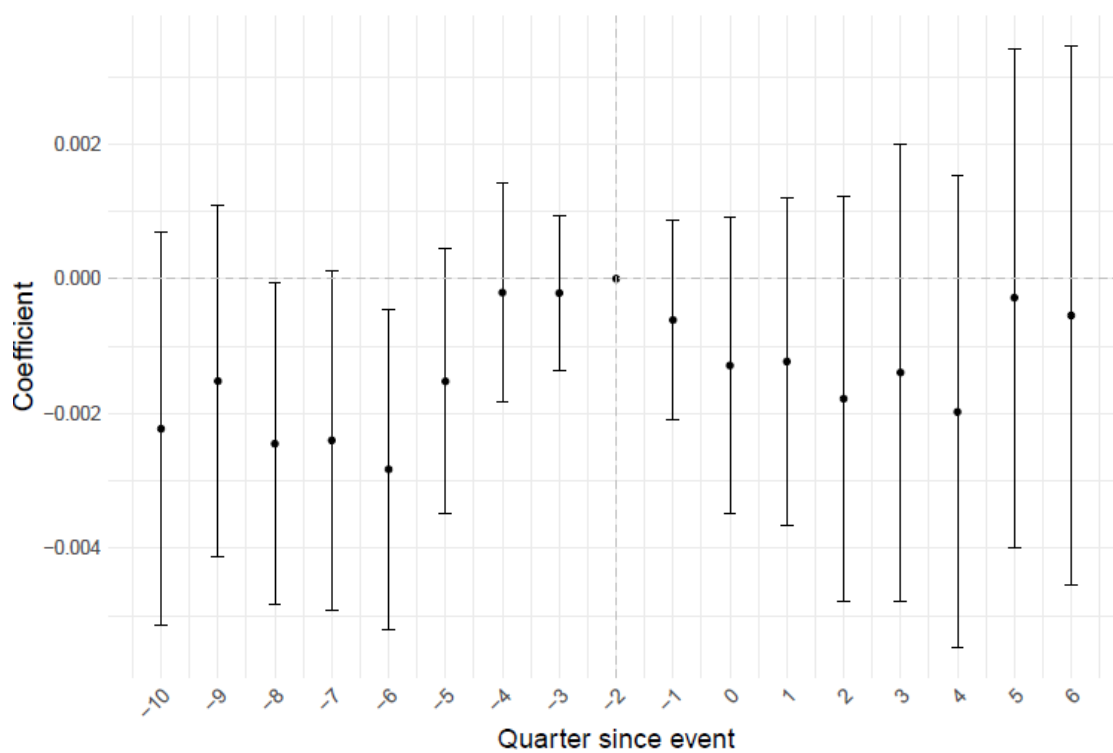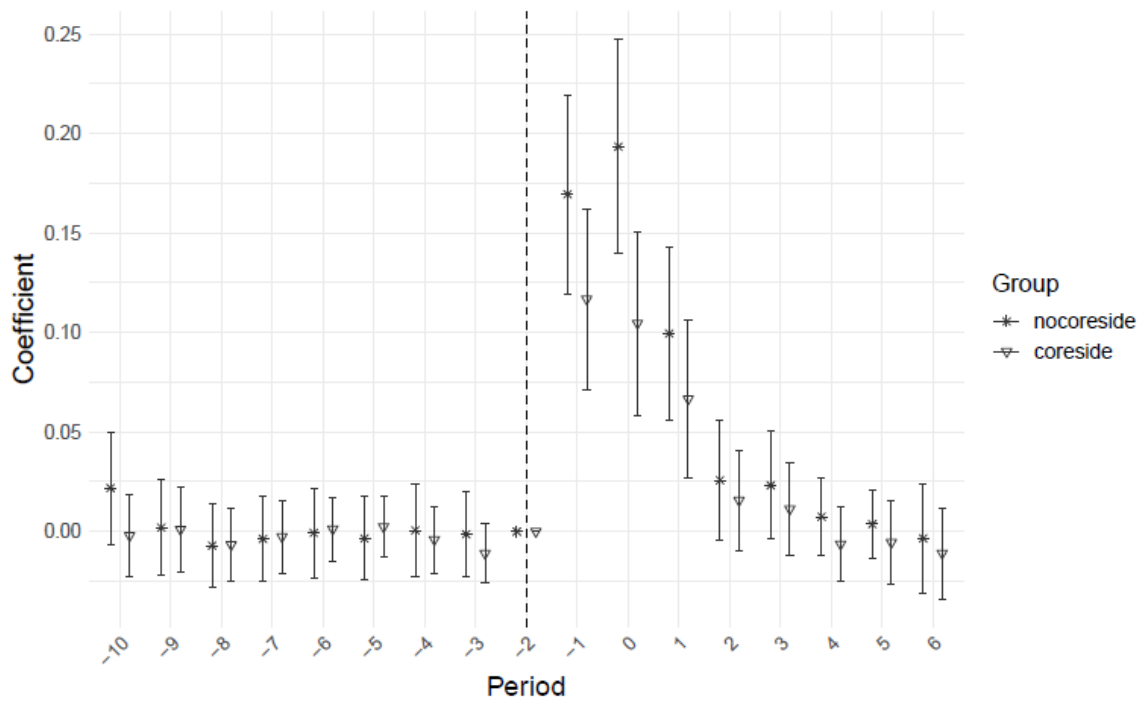
Panel A.

Panel B.

Figure 6. Unemployment insurance receipt among 20s workers in intergenerational co-residence and living independently, after 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)
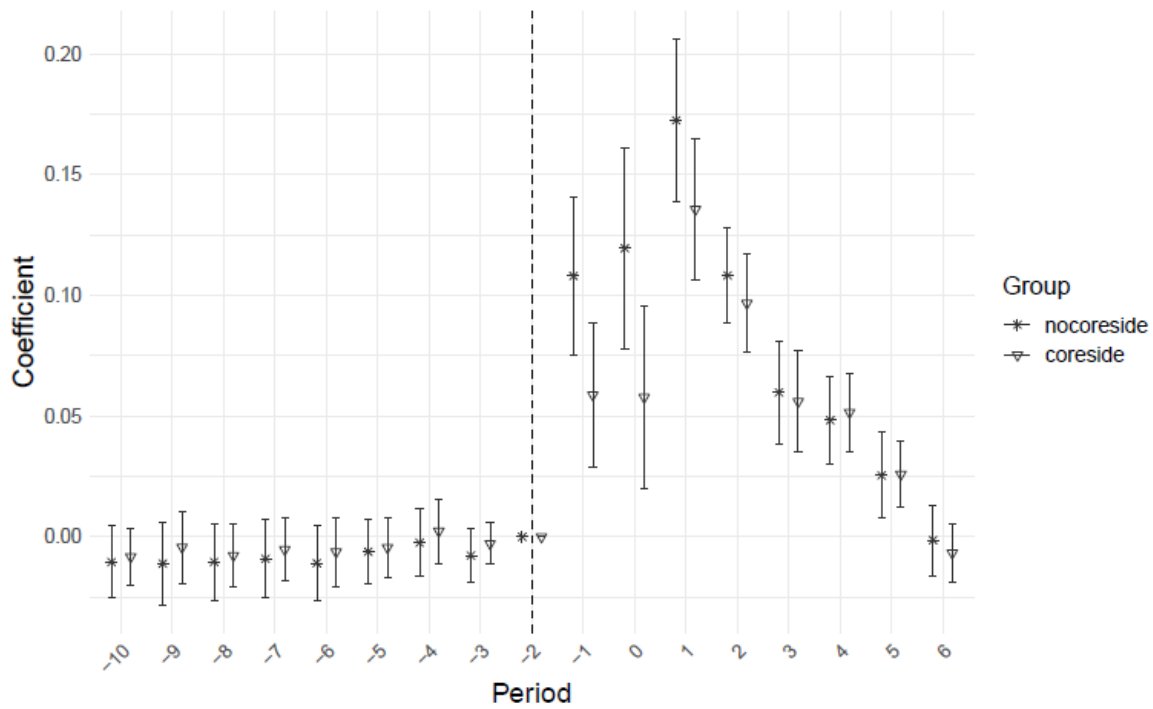
Panel A.

Panel B.

Figure 7a. Employment recovery by age group after 2018Q2 mass layoff
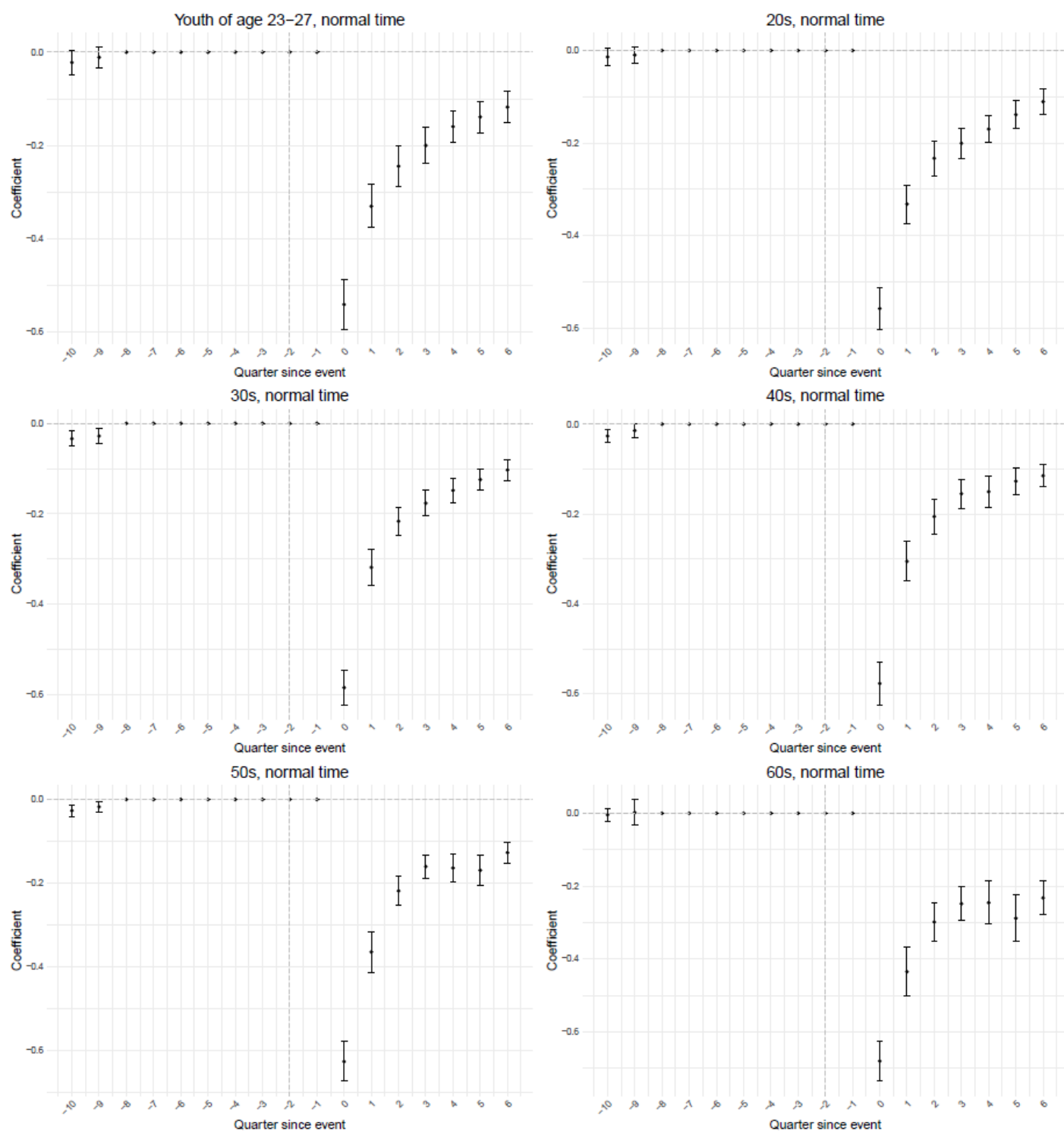Difference in differences event study estimates based on expression (1)

Figure 7b. Employment recovery by age group after 2020Q2 mass layoff
Difference in differences event study estimates based on expression (1)

Figure 8a. Conditional log earnings estimates by age group after 2018Q2 mass layoff
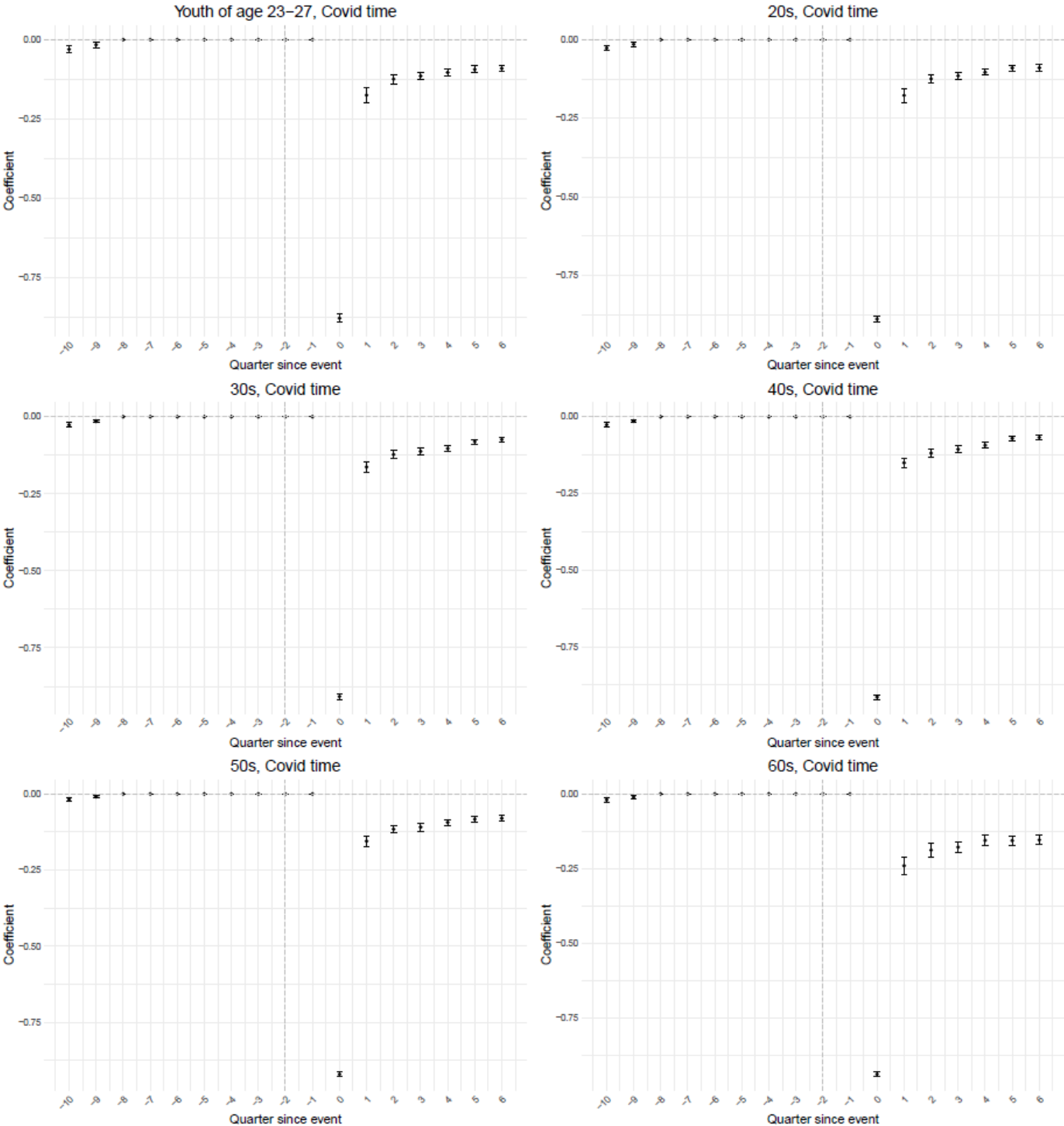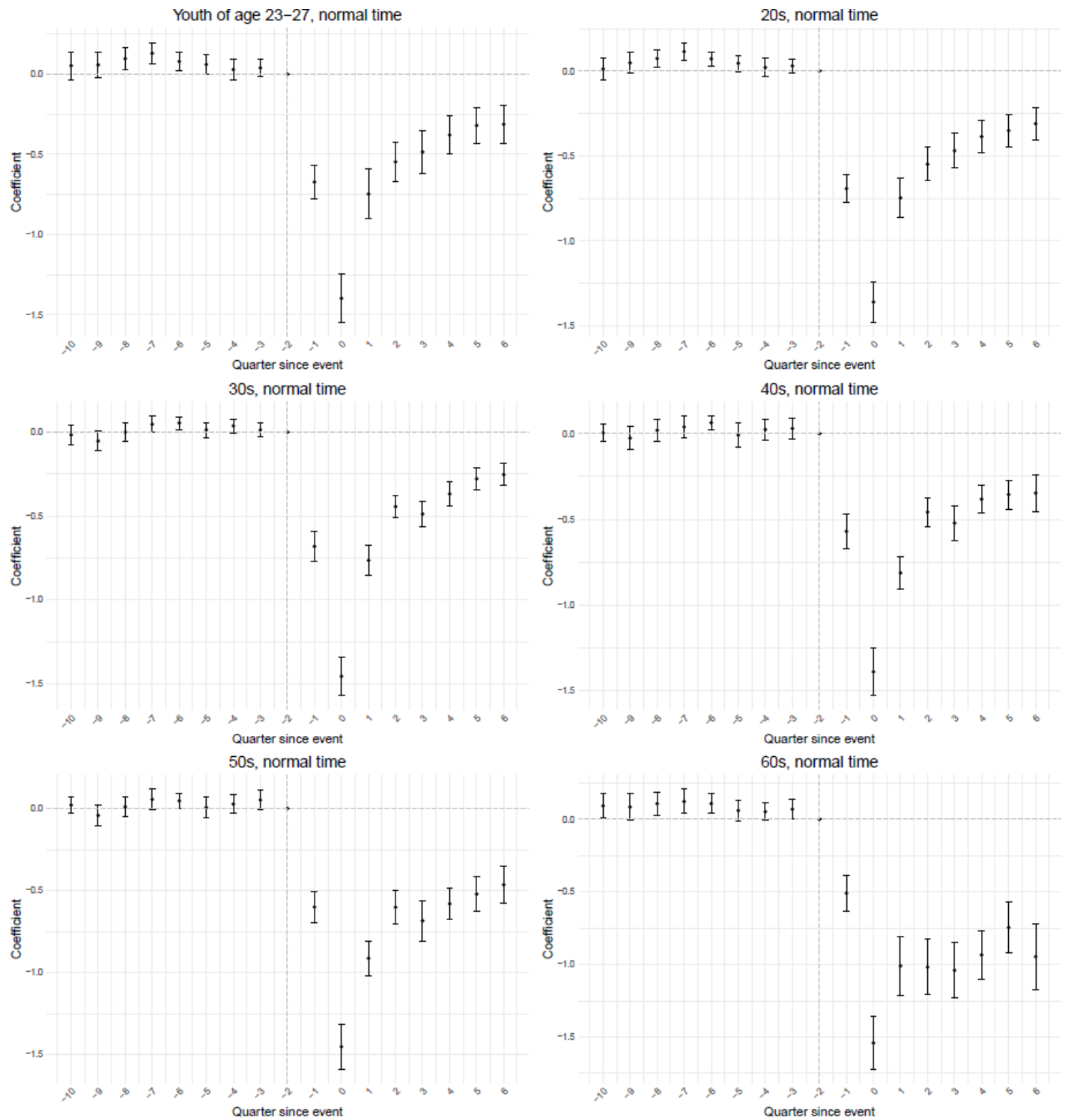Difference in differences event study estimates based on expression (1)

Figure 8b. Conditional log earnings estimates by age group after 2020Q2 mass layoff
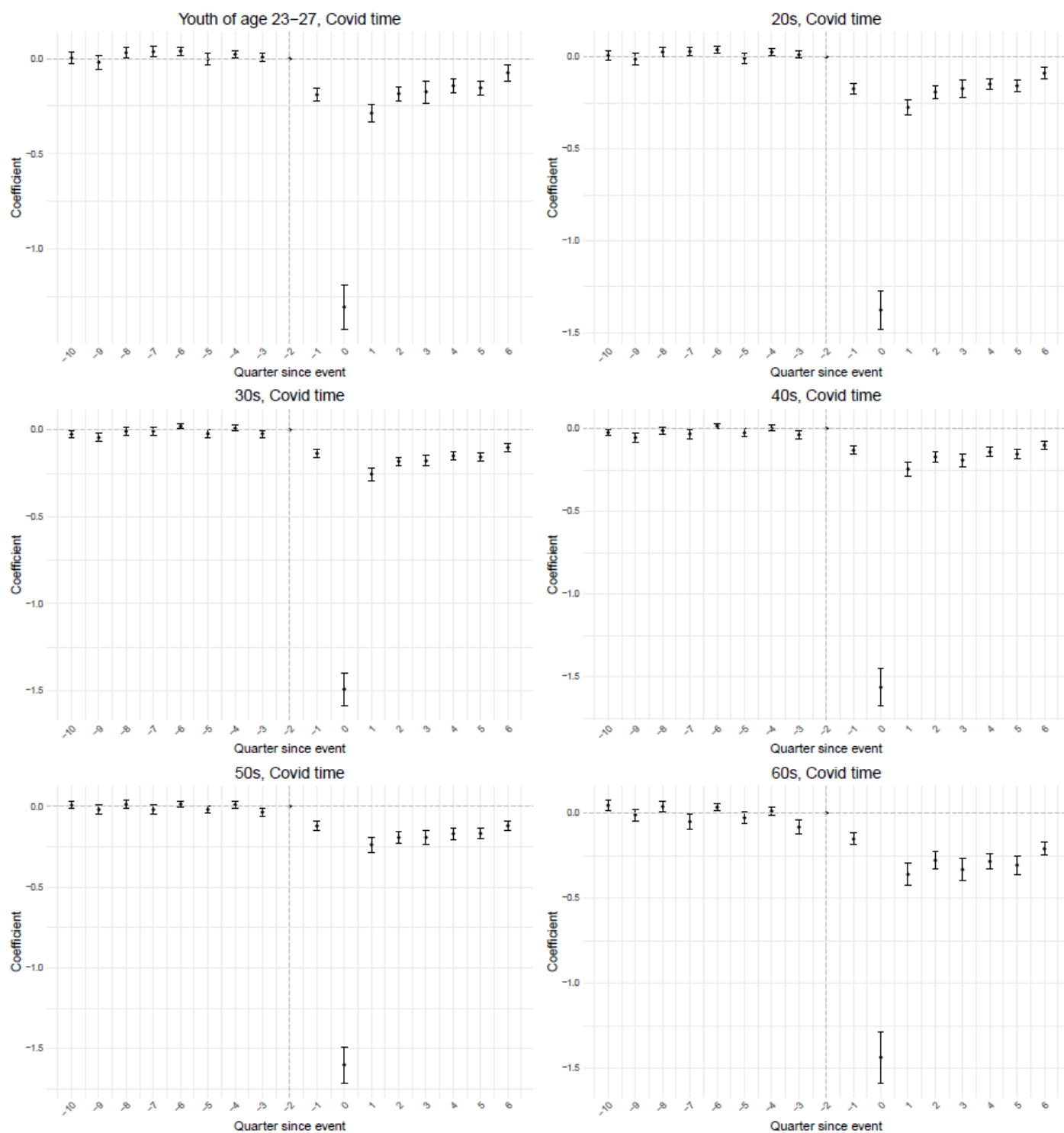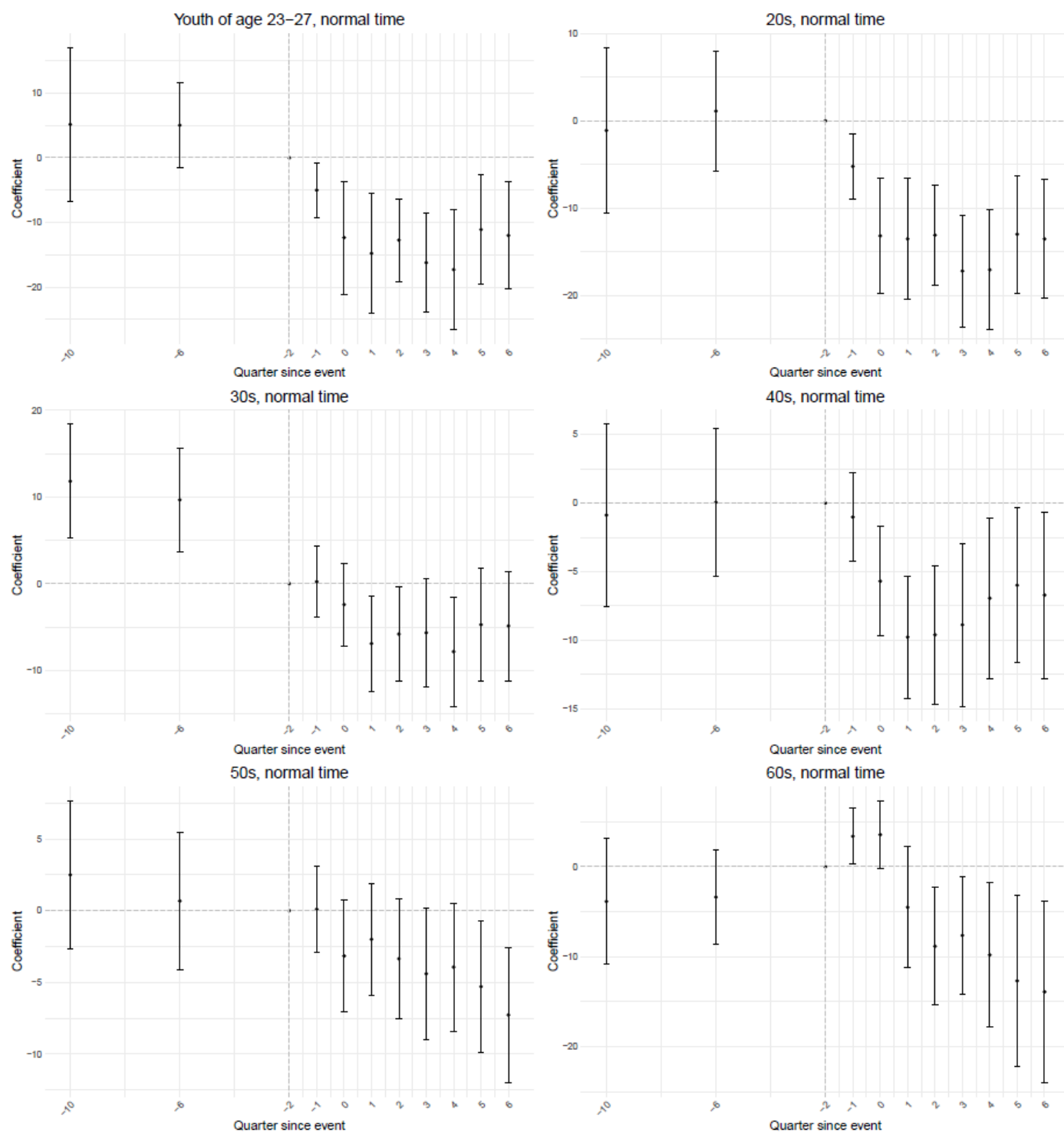Difference in differences event study estimates based on expression (1)

Figure 9. Credit score estimates by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

Tables

Table 1. Pre-Covid and Post-Covid Sample Sizes

Age	Pre-Covid			Post-Covid		
	Control	Treated	All	Control	Treated	All
23-27	3,687	455	4,142	4,863	4,059	8,922
20s (23-29)	5,514	646	6,160	7,630	5,790	13,420
30s	10,426	815	11,241	14,675	7,128	21,803
40s	12,325	645	12,970	16,755	6,437	23,192
50s	13,430	736	14,166	17,754	6,317	24,071
60s	6,345	676	7,021	8,891	4,714	13,605
All	51,727	3,973	55,700	70,568	34,445	105,013

Note: This table shows the number of workers contained in each sample. The *pre-Covid* sample includes the period from the last quarter of 2015 to the last quarter of 2019. The *post-Covid* sample includes the period from the last quarter of 2017 to the last quarter of 2021. The *treated* group consists of individuals who worked for the same mass-layoff firms for four quarters before separating from their jobs resulting in zero earnings in the subsequent quarter. The control group consists of individuals who worked for the same mass-layoff firms throughout the period.

Table 2. Summary statistics of young workers before job displacement

	Pre-Covid			Post-Covid		
	Control	Treated	Difference	Control	Treated	Difference
Averages						
Age	25.3	25.2	-0.1	25.4	25.0	-0.3 ***
Quarterly earnings	11,410	6,463	-4,947 ***	12,767	6,857	-5,910 ***
% who are						
Male	51.5	43.7	-7.7 ***	54.6	44.0	-10.6 ***
Female	38.2	42.0	3.8	36.4	44.3	7.9 ***
Of other or unknown gender	10.3	14.3	4.0 **	9.0	11.6	2.7 ***
Single	40.4	42.9	2.5	34.4	36.9	2.5 *
Married	26.0	24.2	-1.8	27.5	24.1	-3.4 ***
Of unknown marital status	33.6	33.0	-0.7	38.1	39.0	0.9
AUA recipients	7.4	5.1	-2.3 **	8.3	8.9	0.7
Co-residents	36.9	38.7	1.8	37.1	39.4	2.3
% who have						
Credit scores	92.9	91.9	-1.0	93.6	89.0	-4.6 ***
Any debt	80.6	60.0	-20.6 ***	87.2	75.3	-11.9 ***
Any card debt	54.9	38.2	-16.7 ***	64.1	51.6	-12.5 ***
Any mortgage debt	15.4	4.6	-10.8 ***	22.8	8.1	-14.7 ***
Any auto debt	48.5	28.8	-19.7 ***	54.0	40.9	-13.1 ***
Any student debt	41.6	38.0	-3.5	36.9	38.1	1.2
Averages among > 0						
Credit score	656	596	-61 ***	680	645	-35 ***
Total debt	45,317	25,927	-19,391 ***	61,121	36,631	-24,489 ***
Card debt	2,559	2,576	18	2,742	2,387	-355 ***
Mortgage debt	117,778	86,954	-30,824 ***	144,785	143,845	-941
Auto debt	13,631	13,846	215	16,751	15,231	-1,519 ***
Student debt	27,388	28,200	812	25,283	26,580	1,297

Table 3. Percent of young workers in industries before job displacement

2-digit NAICS	Description	Pre-Covid		Post-Covid	
		Control	Treated	Control	Treated
11	Agriculture, Forestry, Fishing, and Hunting	0.5	0.4	0.5	0.0
21	Mining, Quarrying, and Oil and Gas Extraction	0.7	0.0	0.4	0.3
22	Utilities	0.2	0.0	0.1	0.0
23	Construction	7.4	2.0	7.3	2.8
31-33	Manufacturing	11.6	7.3	15.3	9.7
42	Wholesale Trade	3.6	2.9	3.0	2.5
44-45	Retail Trade	11.0	12.7	9.0	9.6
48-49	Transportation and Warehousing	6.8	3.7	5.0	3.4
51	Information	1.9	1.3	1.0	1.3
52	Finance and Insurance	4.4	3.3	2.8	2.0
53	Real Estate and Rental and Leasing	1.5	2.2	0.8	1.5
54	Professional, Scientific, and Technical Services	4.5	5.1	4.1	3.2
55	Management of Companies and Enterprises	2.2	1.1	1.3	1.3
56	Administrative, Support, Waste Management, and Remediation Services	6.6	17.8	5.4	9.8
61	Educational Services	5.7	2.9	16.0	1.7
62	Health Care and Social Assistance	9.6	13.6	8.8	11.9
71	Arts, Entertainment, and Recreation	5.5	3.1	4.6	4.4
72	Accommodation and Food Services	11.6	19.3	10.1	31.0
81	Other Services (except Public Administration)	2.7	0.9	2.5	3.4
92	Public Administration	2.0	0.4	2.0	0.2