Who supports young workers through job loss?*

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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 reports from a leading national credit bureau, 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 and sixties draw approximately half as much unemployment insurance as mid-career workers in response to layoffs. If younger 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. Lenders are estimated to be of little help: We estimate that younger displaced workers actually decrease credit card borrowing in response to job loss and, if displaced in the pandemic, rely little on pandemic lender forbearance. However, family support is clear: we find evidence that less stably attached younger workers move home to elders in response to displacement. Further, we find that the specific young workers who lived with elders before displacement are less than half as likely to draw UI benefits. 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. Young displaced workers who co-reside with elders are no slower to re-employment but achieve considerably more complete earnings recovery by six quarters after displacement.

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

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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 displaced workers at earlier or later career stages more apt to claim unemployment insurance benefits? 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 reasons attributable to the worker, the employer, or the program, missed by Ohio's state unemployment insurance system.[4]

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

[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).
[4] Lachowska et al. (2022) describe workers', employers', and government programs' contributions to failed take-up.

layoff employers.[5] [6] Event study estimates in this worker sample regress employment and financial outcomes on time until and since displacement, controlling for individual, industry-quarter, and location-quarter fixed effects, and other time-varying characteristics. 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 over the life cycle in the stable economy of 2018-2019 to 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 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. We use our matched OSU-CCP consumer credit histories and OLDA-ODJFS

[5] This approach follows the mass layoff approach to estimating the causal effects of job loss that was developed by Jacobson, LaLonde, and Sullivan (1993), hereafter JLS, and advanced by Lachowska, Mas, and Woodbury (2020) and others. See Section 2 for further details on the mass layoff method.

[6] 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.

jobs data to track borrowing, measured creditworthiness, forbearance, and repayment through job loss.[10] 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?

Young displaced workers are estimated substantially to decrease credit card borrowing following job loss in 2018, by as much as 75 to 90 percent at four through six quarters after job loss, which only reinforces any consumption deficit. In contrast, mid-career workers reduce credit card debt at half of this rate or less, and older workers show no significant decline in credit card balances after layoff. Once again, our estimates point to comparatively minimal reliance on traditional sources of consumption support among displaced younger workers.

Credit market solutions to job loss were quite different during the unprecedented circumstances of the COVID pandemic. Through the collection of pandemic-era public and private consumption supports, we estimate that credit card balances, broad delinquencies, and credit scores were surprisingly stable through job loss across our various worker groups. One question our analysis is able to address is the extent to which pandemic-era lender forbearance actually found displaced workers. Our estimates indicate that displaced workers in their forties were 1.4 percentage points more likely to benefit from lender forbearance by the first full quarter of displacement.[11] Given the limited prevalence and brief duration of pandemic lender forbearance, this result indicates that lender forbearance did meaningfully target displaced mid-career workers. Estimated forbearance differentials for displaced workers in their twenties and sixties are, however, negligible.

Having accumulated evidence that young displaced workers in a stable job market (2018-2019) draw very limitedly on UI benefits and credit card borrowing, and do not increase borrowing and are approximately without lender forbearance in the pandemic crisis (2020-2021), we shift our focus to whether displaced young workers turn to intergenerational family connections for help through unemployment. Intergenerational co-residence has long been recognized as a margin along which young adult workers may accommodate labor market and financial setbacks.[12] More broadly, young workers may have greater existing connections to financially supportive

[10] We have built this expansive data resource in collaboration with a leading US credit bureau, 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.

[11] This claim pertains to mortgage and auto loan forbearance only. We set aside student loan forbearance, as it was universal for the 90 percent of the student loan market comprised of federal loans.

[12] See Kaplan (2012), Dettling and Hsu (2018), and Bleemer et al. (2024).

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? 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 in the event of job loss? And, finally, do displaced young workers with family support recover more effectively, in career and financial terms?

We estimate that young workers do indeed respond to job loss with an increased rate of moving home to elders, but that this is true only in an estimation sample in which we impose lenient standards for pre-displacement job stability. Approximately half of our young worker sample co-resides with parents or similar elders just before the time of job separation. These workers may also benefit from intergenerational family support. Therefore we estimate heterogeneity in UI benefit receipt by family support. Estimates indicate that young workers who co-reside with elders draw UI benefits less than half as much as non-co-resident young workers following layoff, all else equal. 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. Under the assumption that mid-career workers rely comparatively little on support from elders, the magnitude of our family support heterogeneity estimates goes far toward reconciling the large gap in UI uptake between displaced workers in their twenties and forties.

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.

Perhaps most centrally to this paper, heterogeneity estimates by family support demonstrate that, while young displaced workers with family support are not faster or slower to re-employment, and do not differ in the extent of their credit recovery, those with family support are able to recover a substantially greater share of their pre-displacement earnings by six quarters after job loss.

This paper is organized as follows. Section 2 describes some of the most closely relevant literature on the mass layoff method of estimating causal effects of job loss and on debt and credit across the life cycle. Section 3 details our anonymized state of Ohio and private credit bureau data sources and anonymized hashing to create a more comprehensive description of Ohio workers' finances, employment, and household structures than was previously available. Section 4 develops our mass layoff estimation methods, including inherited features and special adaptations for our timing and data. In Section 5, 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, and we perform a deep dive into the interdependence of intergenerational support, UI receipt, and recovery from job loss at the level of the individual young worker. Section 6 offers some concluding discussion.

2. Related Literature

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. The findings of their multi-modal analysis build confidence in traditional mass layoff methods.

A second relevant literature for this project pertains to credit use across the life cycle, and as a source of consumption support in unemployment. Regarding job loss, 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 separation, displaced workers may support consumption in the face of income loss by borrowing. Relevant evidence on these processes appears in See Braxton et al. (2020), Keys (2018), Aaronson et al. (2019), and Dempsey and Ionescu (2021). 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, as described by Athreya et al. (2012), Blattner et al. (2022), and Chatterjee et al. (2023).

Regarding life cycle patterns of credit use, we know that 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. In terms of new borrowing, both credit scores and existing credit lines increase steeply, approximately monotonically, with age. Collins et al. (2013) and Lusardi, Mitchell, and Oggero (2020) investigate developments in debt at older ages. Brown et al. (2020) describe outstanding debt over the life cycle, the recent "graying" of US debt, and the steep, monotonic, near-linear association between age and credit score. 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.

3. 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 with one of the three leading US national credit bureaus. The bureau'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 credit bureau Consumer Credit data and associated high-cost credit data for 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).[13] 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 workers.[14] 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.[15]

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.[16] 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

[13] 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.

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

[15] 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.

[16] 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.

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.[17] 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 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.[18] 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.[19] 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.

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

[18] 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.

[19] 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.

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.[20] 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 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 130,000 individuals.

Table 2 reports the means of various relevant demographic and financial characteristics of the young workers in their twenties in our samples before their job displacement, overall and separately for the displaced and non-displaced workers in our pre-pandemic and pandemic mass layoff samples. Most noticeably, in both pre-Covid and post-Covid periods, the treated groups have much smaller quarterly earnings (about \$11,800 and \$11,200) than their respective control groups (about \$15,100 and \$16,400). 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. In addition, Table 2 indicates meaningful differences between displaced and non-displaced workers across several observable, and largely time-fixed, characteristics.

[20] 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.

Finally, as a large portion of our analysis involves a deep dive into the supports and recovery from job loss of younger workers, Table 3 details the industry of the primary pre-displacement employer of young workers in the control and treated groups. While each mass layoff sample firm must be represented by a meaningful share of treated workers in our estimation sample based on the OLDA/ODJFS large and representative Ohio worker dataset, we observe that young treated workers are more concentrated in the industries with lower wages, such as administrative, support, food, and accommodations services. These various descriptive statistics suggest substantial individual heterogeneity that systematically differs between the control and the treated groups. The sample features motivate various specification choices, including the use of a range of individual, industry, location, and time fixed effects, flexible time paths by industry and location, time-varying observables, and proportional credit balance and earnings recovery outcomes, described in the following section.

We conclude this section with a word on the role of qualification for unemployment benefits in our analysis. The OLDA-ODJFS administrative employment record is generated based on reporting required of Ohio employers regarding UI-covered jobs. Therefore all members of our estimation sample are in UI-covered employment (at least until displacement). The mass layoff sample construction requires 8 quarters of stable employment with the primary employer, while Ohio UI eligibility begins at 20 weeks and peaks at 26 weeks of covered employment during our sample window. Therefore all members of our estimation sample are eligible based on employment duration. The longstanding mass layoff method is designed with the intention of isolating involuntary job loss, which is particularly difficult for labor economists in most settings, as, in other circumstances, even the worker or employer themselves may be limitedly aware of the voluntary or involuntary nature of the separation. Therefore, if the assumptions of the mass layoff approach are valid, this method goes some distance toward isolating involuntary separation, which is required for UI eligibility. The final requirement for UI eligibility in Ohio is an earnings threshold. This threshold is quite low relative to the location of the distribution of earnings in our mass layoff sample. For example, the 2017 Ohio weekly earnings threshold is $211, while our sample mean weekly earnings are on the order of $1000 (depending on some criteria). Limiting the sample to earnings-eligible workers is, therefore, not an especially restrictive cut. This leaves us with a decision to make: do we execute a comprehensive analysis of the various sources of support through job loss of all Ohio workers who were stably attached to traditional (UI-covered) jobs, including this small slice of low earners, or do we narrow our focus to the supports accessed by UI earnings-eligible workers alone? In the following analysis, we adopt the former all-workers approach; estimates that remove the small slice of low-income workers who are not earnings-eligible may be requested from the authors.

4. Empirical Specification

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

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

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, $\mu_{I(j)q(t)}$ is an industry-quarter fixed effect, where industry *I(j)* reflects the industry of worker *i*'s primary employer *j* at time zero. $\gamma_{lq(t)}$ 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.

5. Results

5.1 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.[21]

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. 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-

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

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.

5.2 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.[22]

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

[22] 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 likely lead to an inference of widespread loan accommodation among workers in their 20s and 30s that is unrelated to job loss.

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.

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.[23] 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.

5.3 Family Sources of Support for Younger Workers

[23] 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.

In this section, we turn to measured indications of family support for displaced young workers. In doing so, we set aside the question of older workers' sources of support through job loss, despite their low reliance on UI benefits and lender forbearance, and their (surprisingly) unchanged mean credit card balances through unemployment. Older workers' limited recourse to government and lender unemployment support in response to job loss may pertain largely to accumulated wealth and the influence of job loss on retirement timing, a subject treated by an accomplished literature, from Chan and Stevens (1999) through Goda et al. (2023) and beyond.[24] Without additional data on household wealth and Social Security benefits, we suspect that questions of job loss and retirement timing are not only better treated elsewhere but also beyond the scope of our resources. Our analysis is distinct, however, in its ability to shed light on the simultaneous, individual-level patterns in our particular collection of public, private, and family supports through job loss for early- and mid-career workers.

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, and even shed the majority of their credit card debt, then how do they weather the income loss of unemployment? Younger workers typically lack meaningful accumulated wealth. 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 unexpected job loss, 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.[25] Second, we use proprietary methods in the credit bureau data to track account sharing. We identify young adults who do and do not

[24] In addition, the available evidence indicates that the older working cohorts in these time periods hold unprecedentedly high average wealth and retirement benefit claims, relative to the resources of younger generations and to past cohorts at this life stage. See, for example, Collins et al., Brown et al., Lusardi et al. Extensive retirement resources, on average, may suggest that many members of this group are well prepared for the retirement transition. Heterogeneity in retirement resources of course implies that some workers may experience substantial welfare losses from an unanticipated layoff that forces retirement.

[25] 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 in credit report data. Note, for example, that co-residence with a household member 15 to 45 years older occurs as a result of large age difference marriages or partnerships approximately three percent of the time in the Current Population Survey.

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 investigate transitions into family support in response to job loss, and, in the following section, the differences between the career and financial recoveries of displaced workers whose histories do and do not indicate family support.

Let us begin by describing 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 the mass layoff sample of workers who held steady employment with a primary firm for eight quarters, whose primary employer was among those fitting our mass layoff criteria, and whom we observe in Ohio employment records six quarters after the treated group's layoff, 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. This is in surprising contrast to the findings of Kaplan (2012) and others. Moreover, in an analogous exercise comparing the rates of transition into AUA recipiency in response to job loss, we also find no clear evidence of the emergence of AUA accounts provided by elders in response to job loss. Our stably employed young workers who then experience displacement do not appear to establish new reliance on parents or similar elders in order to weather job loss.

One first exploration of this unexpected result is to relax our estimation sample conditions, asking: if we loosen the pre-displacement stable employment requirement for our young workers, who are well known to experience weaker labor force attachment and also more job-to-job transitions, do we find different family support responses to job loss?[26] Figures 4 and 5 depict event study estimates, following specification (1), of the response of intergenerational co-residence and AUA account holding to job loss for the broader sample of young workers who were attached to a primary employer for at least four, but not necessarily eight, quarters prior to displacement. This shortening of pre-displacement stability requirements is at odds with the prior literature estimating job loss effects using mass layoff, but may be appropriate to our young sample of interest, for whom long attachment to a single employer is less the norm.

As reported in Figure 4, for our lenient pre-displacement attachment sample, we do indeed find that workers in their twenties are significantly and substantially more likely to move "home" in response to displacement. Displaced workers in their twenties who lived independently in the quarter before separation are seven percentage points more likely to have moved home by six quarters after displacement in the pre-pandemic period.[27] They are also more

[26] On age and turnover, see, for example, Mincer and Jovanovic (1981).

[27] This result is significant at the five percent level. The level of intergenerational co-residence rises steadily beginning three quarters after displacement, and continues until the end of the panel, at six quarters after displacement.

likely to move home during the pandemic, but note that all young adults in their twenties were more likely to move home during the pandemic, and so co-residence estimates from this highly unusual time period become somewhat more difficult to interpret. In sum, under restrictive attachment conditions we find that displaced and non-displaced young workers are similarly likely to move home. However, if we loosen our pre-displacement attachment requirement to one year, we expand our sample of young workers substantially, and we estimate large and significant intergenerational co-residence responses to job loss. We infer that twenty-something workers with (characteristic) shorter employment spells do indeed respond to job loss by moving home to elders, and therefore that family support is an important mechanism by which young workers with weaker job stability weather unemployment.

Authorized user account transitions, on the other hand, bear little clear relationship to job loss. In Figure 5, we show event study estimates of the share of young displaced workers who are authorized users on accounts held by parents or similar elders around the time of displacement, among those who had no AUA in the quarter before displacement. This specification is analogous to the above specification for intergenerational co-residence.[28] As depicted in Figure 5, we find no increase in AUA holding in response to job loss among the pre-pandemic sample. Moreover, we find no response for the pandemic sample.[29] While our estimates support a claim that young workers resort to relying on intergenerational residential support in response to job loss, we have no evidence that their parents open new authorized user accounts to support them through 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 identify a co-residence transition response to job loss only under lenient stable attachment criteria, in both the four quarter attachment and eight quarter attachment estimation samples, we observe a population of young workers in which a large subgroup live in intergenerational households. The young workers living in intergenerational households both job loss are excluded from the above co-residence transition estimates, and yet they may also receive support from parents or similar elders through unemployment. This fact raises a question: do young displaced workers with prior evidence of family support rely more on family, and therefore less on public unemployment benefits? Put differently, is family support through job loss a partial explanation for young workers' failure to take up UI benefits?

Luckily, our individual-level administrative data on UI participation and family connections allows us to ask whether it is the specific youth who benefit from family support that also fail to take up available UI benefits in the event of job loss. We estimate event study specification (2), using pre-displacement intergenerational co-residence, and then pre-displacement authorized user status, as the source of heterogeneity in the effect of quarters since job loss on UI benefits. Figure 6 Panel A reports the resulting estimates. In the stable pre-pandemic period, we estimate that twenty-something intergenerational co-residents who experience displacement are 8 percentage points less

[28] For comparability, we have imposed four-quarter attachment instead of eight-quarter pre-displacement attachment, but the AUA results are similar for either attachment condition.

[29] Estimates available from the authors.

likely to receive UI benefits in quarter k = 0 than displaced twenty-something non-co-residents.[30] This can be evaluated relative to a pooled UI take-up in response to job loss by quarter zero for all twenty-something workers of 14 percentage points, as reported in Figure 1a. Assuming that mid-career workers are comparatively unlikely to forego UI benefits as a result of support from elders, this 8 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.

During the pandemic, depicted in Figure 6 Panel B, we estimate that displaced workers in their twenties who co-resided post-separation are three percentage less likely to draw UI benefits in response to job loss, and that this difference emerges immediately, during the k = -1 quarter in which separation is progressing.[31] This smaller estimate emerges in a period characterized by little or no age gradient in UI receipt in response to job loss, as in the Figure 1b estimates. Even in the pandemic, in which various worker groups behaved unusually similarly in terms of UI take-up, young displaced workers who co-reside with elders are less reliant on UI benefits. But worth noting is that the co-residence difference in UI take-up is far stronger for the era in which we observe a steeper age gradient in UI take-up.

Existing theory describing young workers' decision to move home following job loss overlooks their interdependent choices of whether to claim unemployment insurance and whether to move home to weather the unemployment spell and seek new employment. In order to establish a theoretical framework through which to interpret our individual-level estimates of young workers' interdependent residence and UI claiming choices, Appendix A lays out a simple model of work, job loss, UI claiming, and moving home, and responses to both idiosyncratic and aggregate employment shocks.

Beyond intergenerational co-residence, we also look at heterogeneity in UI take-up by authorized user account status. Figure 7 shows that young displaced workers with AUAs do indeed draw UI benefits slightly less than those without AUAs, in both the pre-pandemic and pandemic eras, but also that the estimated heterogeneity in UI take-up by authorized user status is considerably smaller than that by co-residence status. During the pre-pandemic period, AUA recipients were between two and three percentage points less likely to receive UI benefits by quarters k = 1, 2, and 3 beyond displacement.[32] During the pandemic, AUA recipients were four percentage points less likely

[30] This difference is significant at the five percent level.
[31] This difference is significant at the five percent level.
[32] Only the quarter two and three estimates are significant at the five percent level.

to receive UI benefits one quarter after displacement, though this estimate is significant only at the ten percent level.[33]

In sum, we find that younger workers who live with parents or similar elders, and, to a lesser extent, who benefit from AUAs donated by elders, are substantially and significantly less likely to turn to public benefits during unemployment. Hence, young adults with family support do appear to be 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.[34]

5.4 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. In addition to greater family support, 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 and 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 8, 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.

[33] The t-statistic for the test of the null hypothesis that AUA and non-AUA displaced workers in their twenties receive UI at similar rates in quarter $k = 1$ is 0.055.

[34] 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 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.

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 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 9a-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 10, 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 motivates 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.

5.5 Do young workers with and without family support recover from job loss differently?

Given that roughly half of our young worker sample lives with elders, and that those with markers of family support are considerably less reliant on UI benefits through job loss, we would like to know whether young displaced workers with family support recover their employment and earnings more (or less) successfully than young displaced workers without family support. Might families support young workers through longer job searches, allowing them to maintain higher reservation standards for their re-employment positions? Or might they distract young displaced workers from the job search process, leading to slower returns to employment at lower wage jobs? Is the propensity of young workers with family support to forgo unemployment insurance benefits helpful or harmful to career recovery? Estimates of the differences in the employment, conditional earnings, and credit recoveries of young workers with and without family support will reveal gaps between the causal effects of layoff on these outcomes for supported and unsupported youth. While these heterogeneity estimates do not reveal the explicit causal effect of family support on recovery, they will provide clues to possible differences in the search processes that supported and unsupported young workers undergo.

A first insight from our estimates is that young displaced workers with and without AUAs, and who do and do not co-reside with parents or similar elders, in both the pre-pandemic and the pandemic period, return to employment at similar rates. In estimates available from the authors, we estimate the specification (2) difference in differences event study using first intergenerational co-residence and then AUA receipt as the dimension of heterogeneity, and we perform this exercise for the pre-pandemic and pandemic samples. We find closely comparable employment patterns before, during, and after displacement for our various family support and no family support subgroups. This finding is counter, for example, to the hypothesis that family support allows displaced young workers to maintain higher re-employment standards and therefore to search for a longer time before returning to (more desirable) work.

Similar re-employment rates, however, need not imply similar earnings. In Figure 11, we report estimates, based on specification (2), of the difference in the extent of earnings recovery between young displaced workers who did and did not live in intergenerational households immediately before displacement. Panels A and B demonstrate that co-resident young workers recover their pre-displacement earnings more completely, conditional on working. In the pre-pandemic period, co-resident young workers recover roughly 10 to 15 percent more of their pre-displacement earnings than do non-co-resident young workers.[35] During the pandemic, co-resident displaced youth recover a peak of 9 percent of pre-displacement earnings more than non-co-resident youth, with an 8 percent of pre-displacement earnings difference by the sixth (and last) quarter of the panel.[36] Overall, young displaced workers who benefit from intergenerational co-residence are able to recover on the order of 10 percent more of their pre-displacement earnings, conditional on finding work. And, as noted, they find work at a similar rate to their non-co-resident peers.

AUA recipients also appear to recover earnings more completely, though, as with UI reliance, the difference by AUA receipt is smaller than the difference by intergenerational co-residence. In the pre-pandemic period, AUA recipients retained 29 percent more of pre-displacement earnings than non-recipients during quarter k = -1 (while displacement is ongoing). Afterward, the AUA versus non-AUA difference is more or less flat, and does not differ significantly from zero.[37] In the pandemic period the results are more straightforward: AUA recipients recover roughly 10 percent more of pre-pandemic earnings throughout the period, conditional on working.[38] Overall, we do see evidence that young displaced workers who receive authorized user accounts from elder donors are able to recover a greater share of pre-displacement earnings, though the findings for the pre-pandemic period are considerably more ambiguous than the results of the analogous co-residence comparison.

Finally, in estimates available from the authors, we examine whether young displaced workers with family support recover greater financial stability following job loss. We do this by estimating specification (2) with credit score as the outcome marking recovery, again for AUA versus no AUA and intergenerational co-residence versus no co-residence comparisons. Credit score in this instance serves as a summary statistic for financial stability, reflecting a combination of repayment success, available credit (utilization), and credit seeking behavior. Perhaps surprisingly, we find that the large credit score setback that workers in their twenties experience as a result of job loss does not differ significantly for workers with and without family support, and that this is true in both the pre-pandemic and the pandemic period. In short, we fail to find any evidence that families are able to stem the financial fallout of early-career job loss.

Overall, our estimates indicate that, while young workers with family support are no slower or faster in finding re-employment, and no better off in terms of the damage to financial stability that they suffer as a result of job loss, they do enjoy more complete earnings recovery. Whether this difference in earnings recovery is causal, and, if so, the mechanisms by which families bring about more successful job search remain open questions. Most importantly in the context of this paper, our estimates suggest that displaced young workers who benefit from family support in

[35] These point estimates are significant at the ten percent level for k = 4 through 6; the estimate is greatest at k = 5, at 26 percent of pre-displacement earnings, and is significant at the five percent level.

[36] These estimates are each significant at the five percent level.

[37] It is unclear what this initial difference in retained earnings means. One possibility is that AUA recipients separate later in quarter k = -1, retaining earnings through more of the ongoing displacement quarter.

[38] These point estimates differ from zero at the five percent level for quarters k = -1, 1, 5, and 6.

the form of intergenerational co-residence or shared accounts drive the UI under-claiming that we have demonstrated among the younger working cohorts, and those displaced workers who appear to rely on family in place of UI during unemployment are not, on average, disadvantaged when it comes to career recovery.

6. Discussion

Motivated by evidence that displaced workers, and especially lower income displaced workers, under-claim unemployment insurance benefits, we use a unique administrative dataset that includes various public, private, and family sources of support to shed light on the supports that help workers through job loss and recovery. Because the relevance of each source and the nature of career recovery varies meaningfully over the career, we estimate the reliance on public and private resources separately by worker age group.

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 a leading US credit bureau, 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.

Our methods follow the mass layoff approach of Jacobsen et al. (1993) and Lachowska et al. (2020), among others, modified to fit our specific data resource, age segments, and contemporary time period. Among workers displaced by mass layoff in 2018Q2, we find that UI reliance in response to job loss over the life cycle follows an inverted u-shaped pattern. While displaced workers in their 20s are 14 percentage points more likely to draw UI benefits in the quarter after layoff, displaced workers in their 30s, 40s, and 50s are 26, 33, and 30 percentage points more likely, respectively. Workers in their 60s are only 19 percentage points more likely to draw UI benefits in the quarter after layoff. Next we ask whether displaced workers make up for lost income by extending their credit card borrowing. Estimates indicate that no age group responds to layoff by increasing borrowing (less repayment). Strikingly, workers in their twenties steeply reduce credit card debt, through some combination of decreased spending, repayment, and charge-off, by as much as 90 percent by five quarters after layoff. Displaced workers in their thirties and forties show much smaller credit card balance reductions after layoff, on the order of 40 percent by five to six quarters beyond layoff. Displaced workers in their 50s and 60s, however, show insignificant and relatively small card debt declines. Putting together estimates on UI and borrowing, we are left to wonder how young displaced workers, in particular, sustain consumption after the 2018Q2 layoff.

We repeat this estimation for mass layoffs that occurred at the peak of the pandemic, in 2020Q2. Counter to the above inverse u-shaped pattern of reliance on UI benefits, we find an extremely stable pattern of UI benefit reliance across age groups in the pandemic. Each age group is approximately 15 percentage points more likely to draw UI benefits, all else equal, during the quarter after layoff. Turning to the financial market, we find that credit card balance, delinquency, and credit score responses to layoff are very limited during the pandemic, presumably owing to the various private and public supports households received during this time. However, we are able to estimate the response of lender forbearance to mass layoff for our worker age groups in the pandemic. Like the public UI support in more ordinary times, lender forbearance in the pandemic follows an inverted u-shape in worker age. Where workers in their 20s and 60s are roughly 0.5 percentage points more likely to receive lender forbearance (excluding the blanket student forbearance of 2020) following layoff, workers in their 40s are 1.4 percentage points more likely to receive lender forbearance after layoff. (These modest response magnitudes are economically meaningful relative to forbearance prevalence at the time.) Our estimates contain the good news that lender forbearance efforts did indeed differentially support workers experiencing job loss, a clear intention of various lender programs. However, once again, we see traditional job loss supports targeting mid-career workers, and largely excluding displaced young workers.

Given this collection of evidence suggesting that younger displaced workers draw substantially less support from each of unemployment insurance, new consumer borrowing (or slowed repayment), and lender forbearance, we investigate available measurements of intergenerational connections that may support young workers through job loss. (At this point we set aside the question of older workers, who are less reliant than mid-career workers on UI benefits and lender forbearance following layoff, and who do not extend card borrowing. The response of retirement to layoff is well understood by the existing literature, such as Chan and Stevens and Goda et al., and the strength of our data does not lie in measuring retirement wealth, but instead in tracking employment, formal UI benefits, credit, and interpersonal residence and financial connections at the individual level over time.) 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. In addition, we are able to estimate the extent to which young workers with evidence of family support are able to make a more complete recovery from job loss than are unconnected young workers.

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. Moreover, young workers who benefit from family support recover a substantially greater share of past earnings by six quarters after layoff. They do not, however, return to work at a different pace or recover financial stability (as measured by credit score) any more or less successfully.

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 appear to bear the greatest hardship as a result of mass layoff, with displaced workers in their sixties recovering only 75 percent of employment and less than half of their prior earnings even conditional on employment. Evidence from the literature on layoff and retirement points to the possibility that this apparent hardship may be explained by early retirement in response to layoff; to the extent that this includes initiation of retirement benefits, this employment and earnings drop may entail less welfare damage. However, these same older workers do suffer an average 14 point credit score decline six quarters after the job loss, similar to the decline experienced by workers in their twenties after six quarters and substantially greater than the credit score damage experienced by each of the other worker age groups.

These findings may point to an opportunity for connecting very early- and late-career workers with effective UI benefits, thereby sparing both unconnected younger workers and older workers with fewer retirement resources the financial damage from job loss that we have estimated in this study. 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 available measures of family connection are limited. The advancement that we can offer relative to the prior literature is appending novel but incomplete information on connections across workers to large US administrative datasets with market and policy detail. Our measures leave unanswered the question of the various specific means by which family generations may help each other though costly job market shocks, and what kinds of assistance unconnected young workers lack that underlies their greater UI reliance and partial career recovery.

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Figures

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

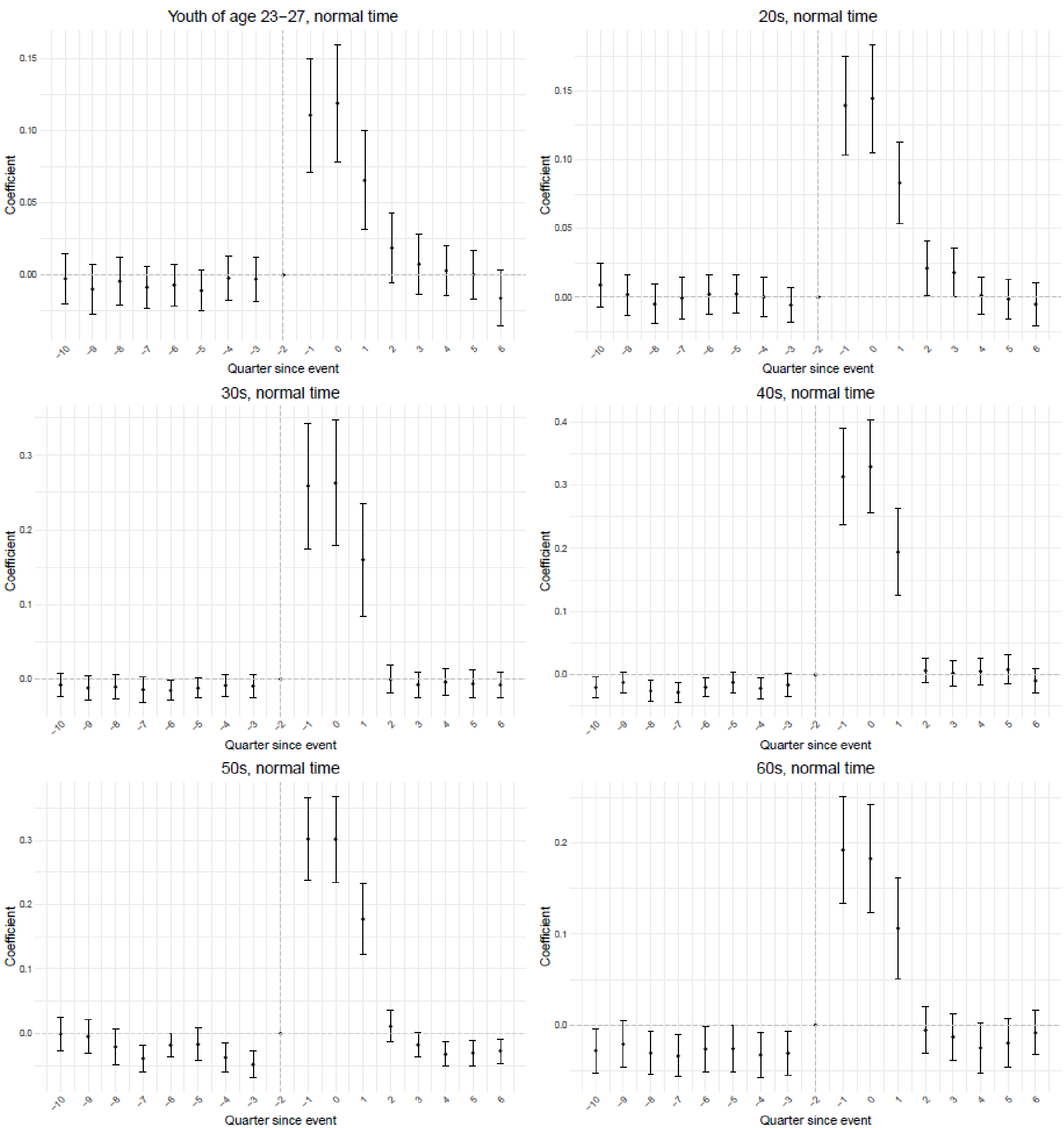


Figure 1b. Unemployment insurance qualification by age group around 2020Q2 mass layoff
Difference in differences event study estimates based on expression (1)

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

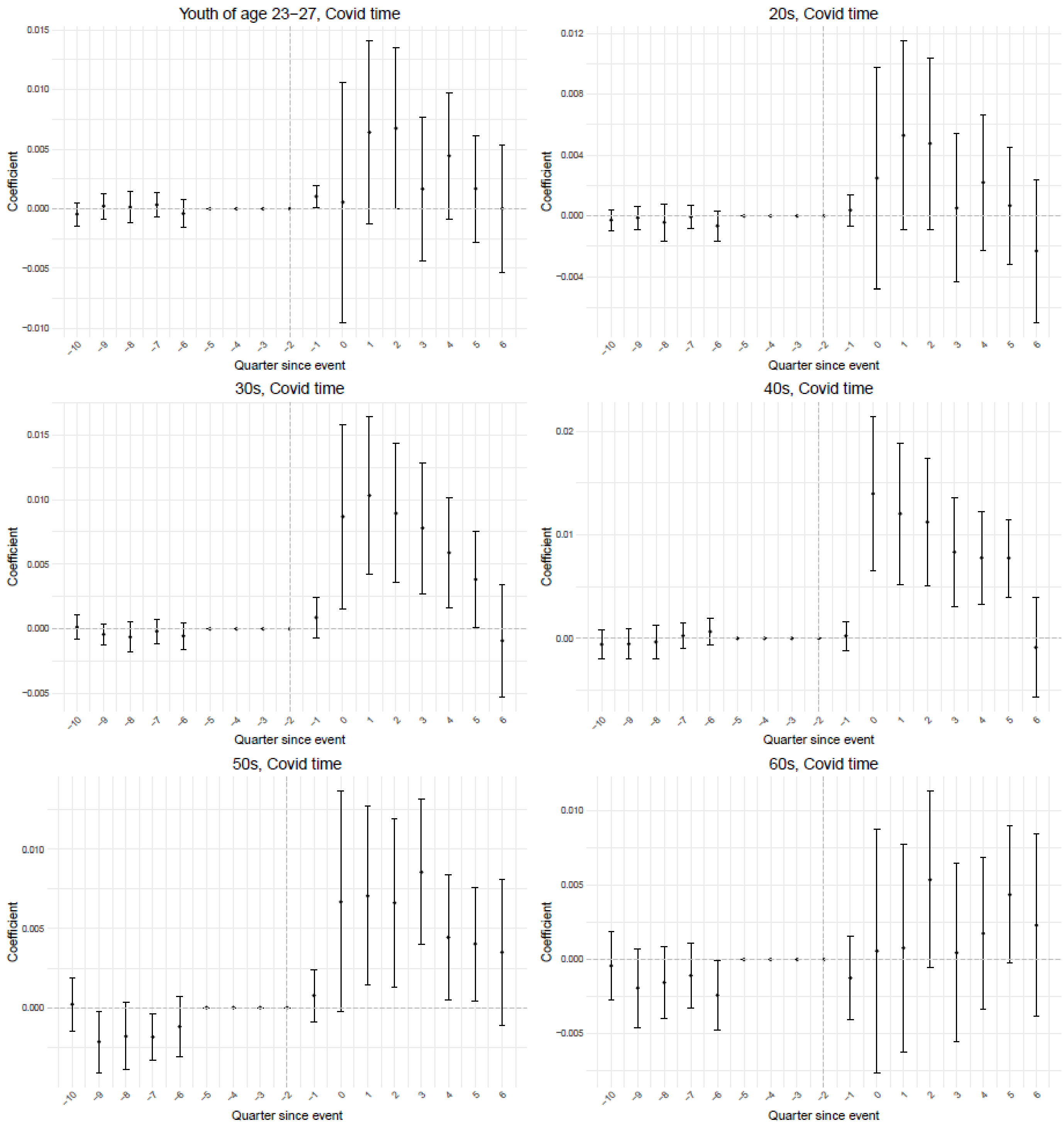


Figure 3. Credit card balance estimates by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

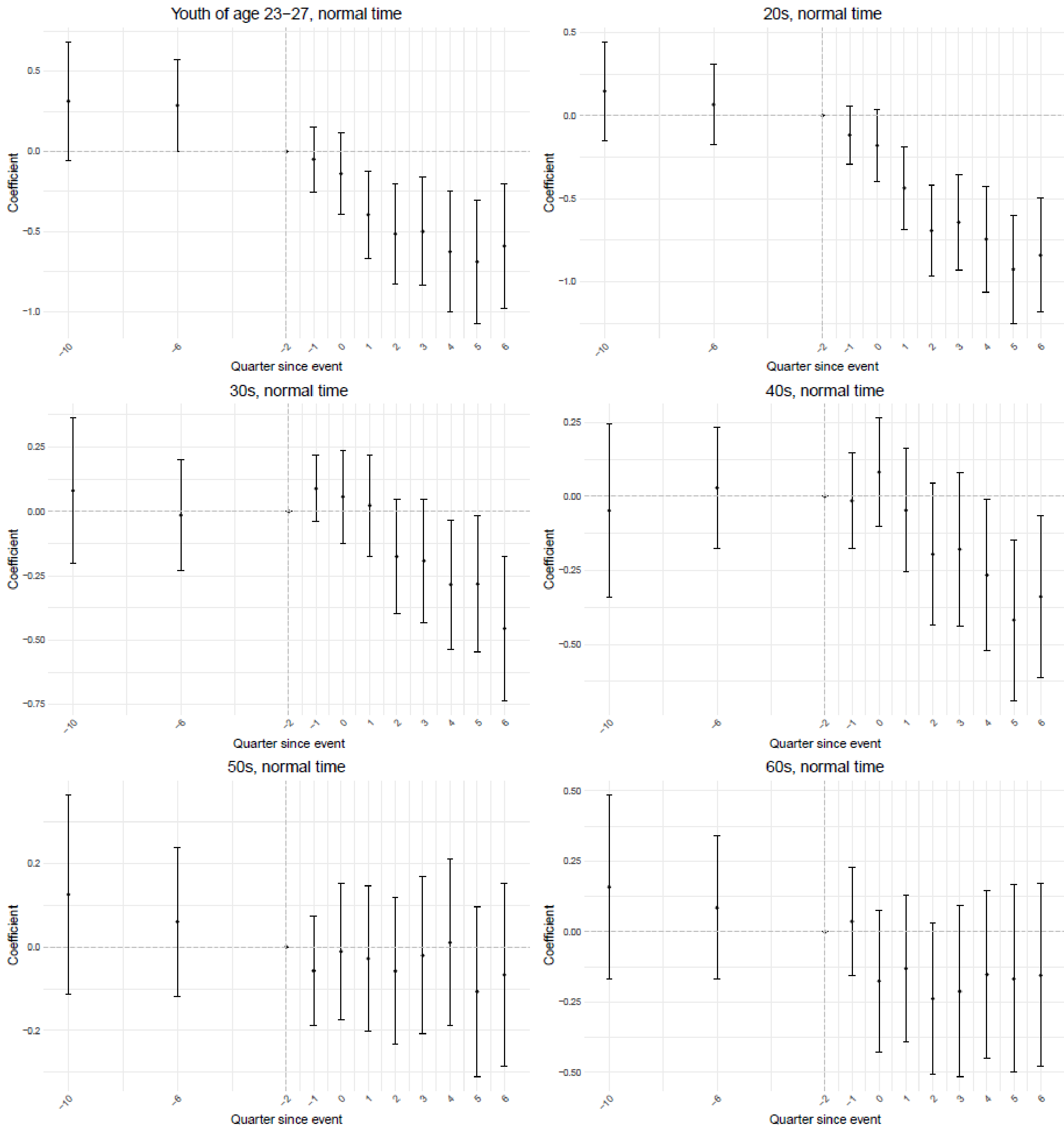


Figure 4. 20s workers' rate of moving to intergenerational co-residence after 2018Q2 mass layoff

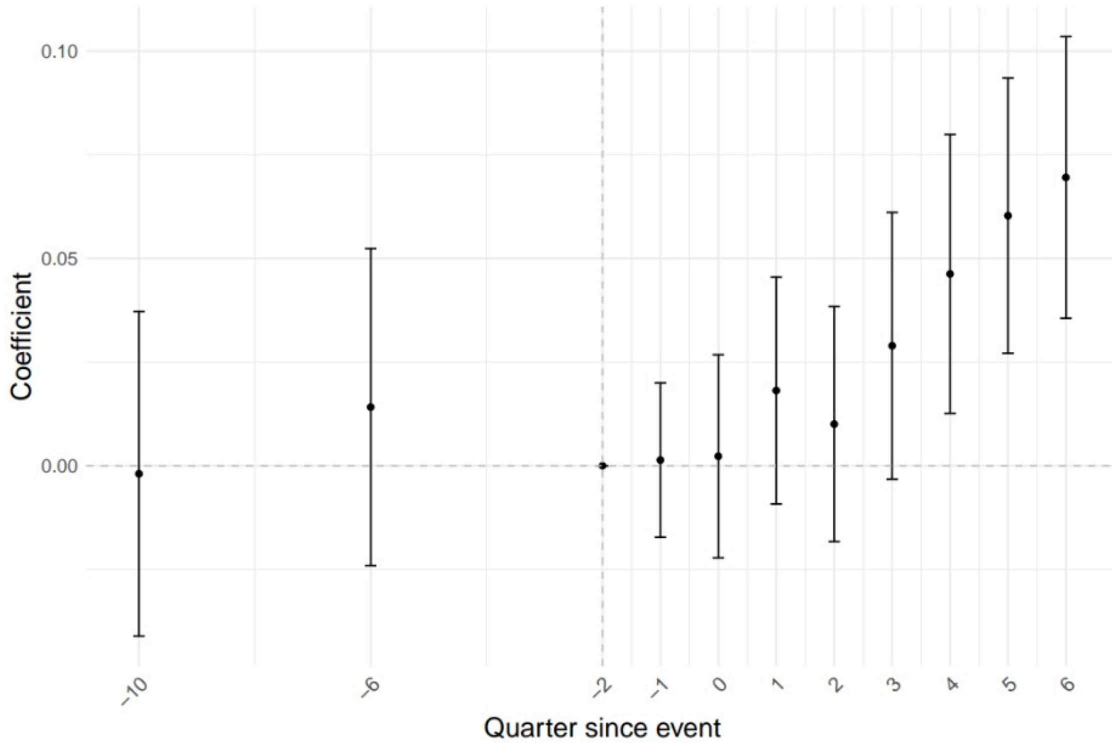


Figure 5. 20s workers' rate of becoming AUA beneficiary after 2018Q2 mass layoff

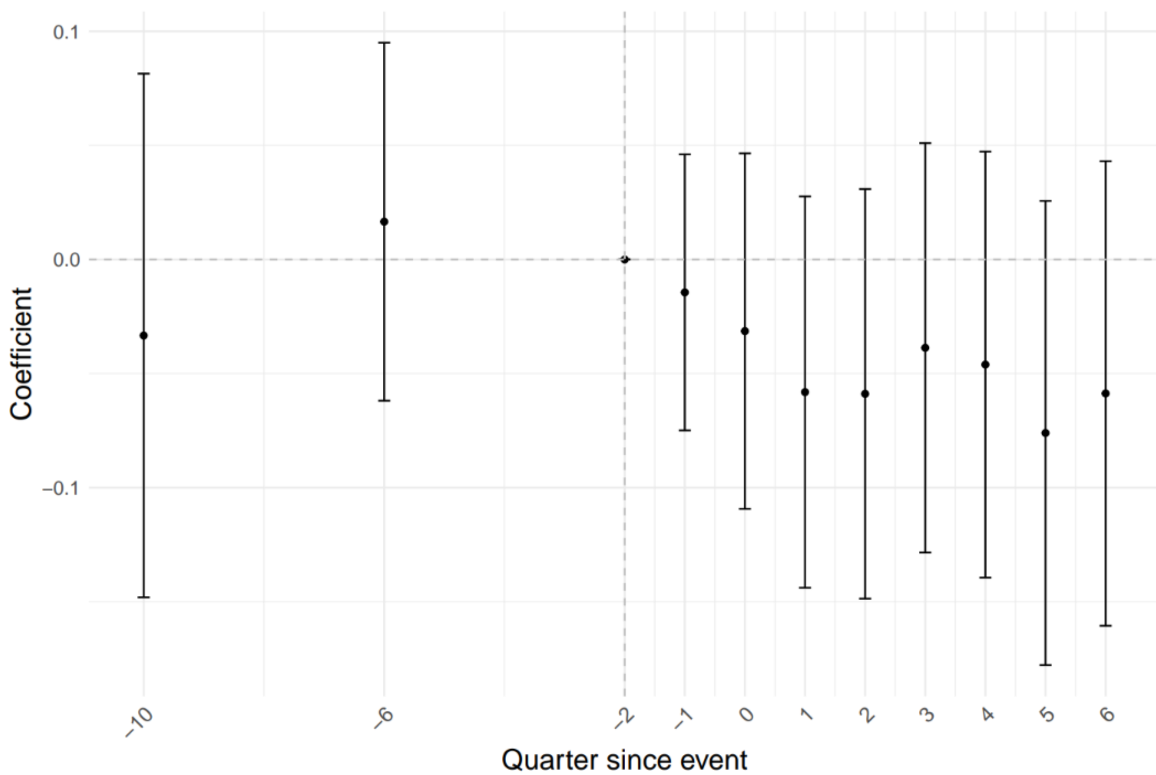
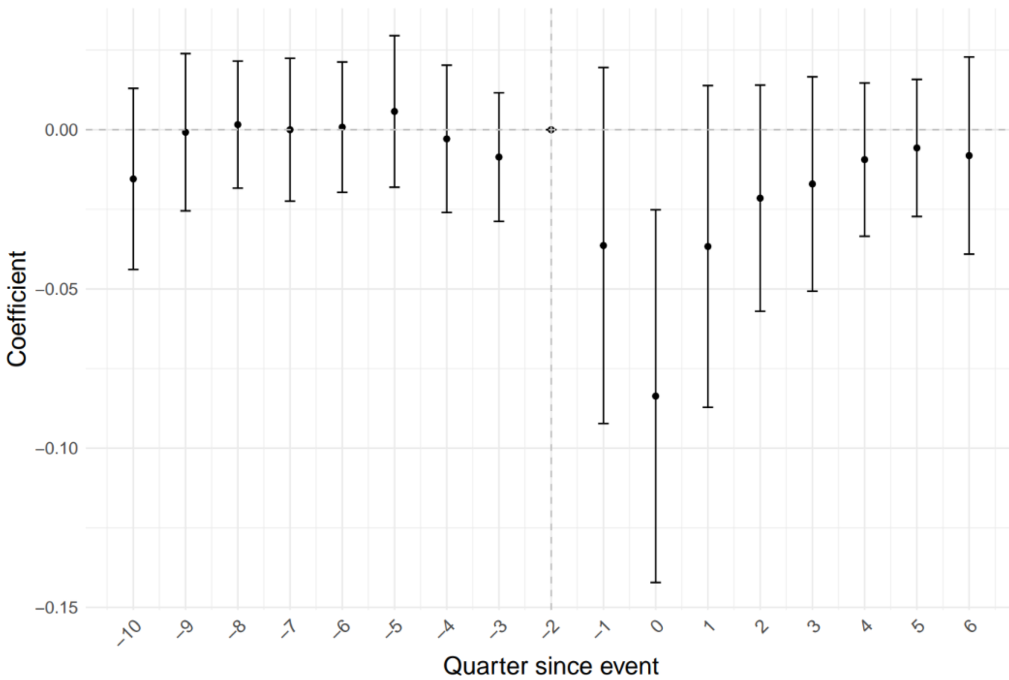


Figure 6. The estimated difference in unemployment insurance receipt between 20s workers in intergenerational co-residence and living independently, derived from specification (2), after 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)

Panel A.



Panel B.

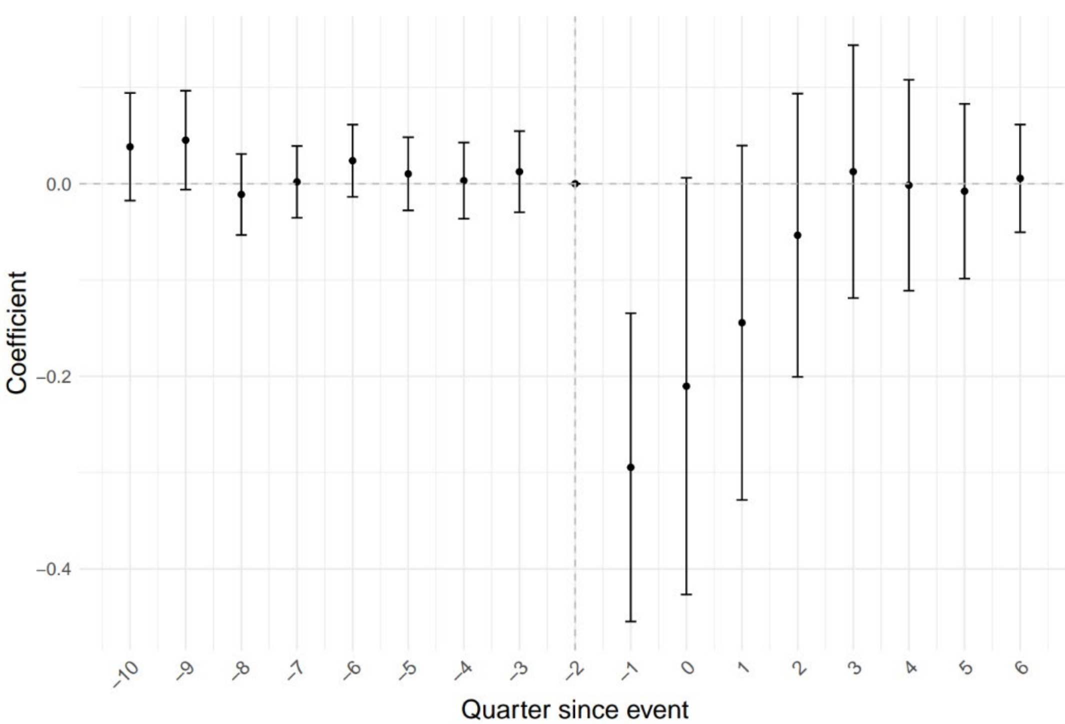
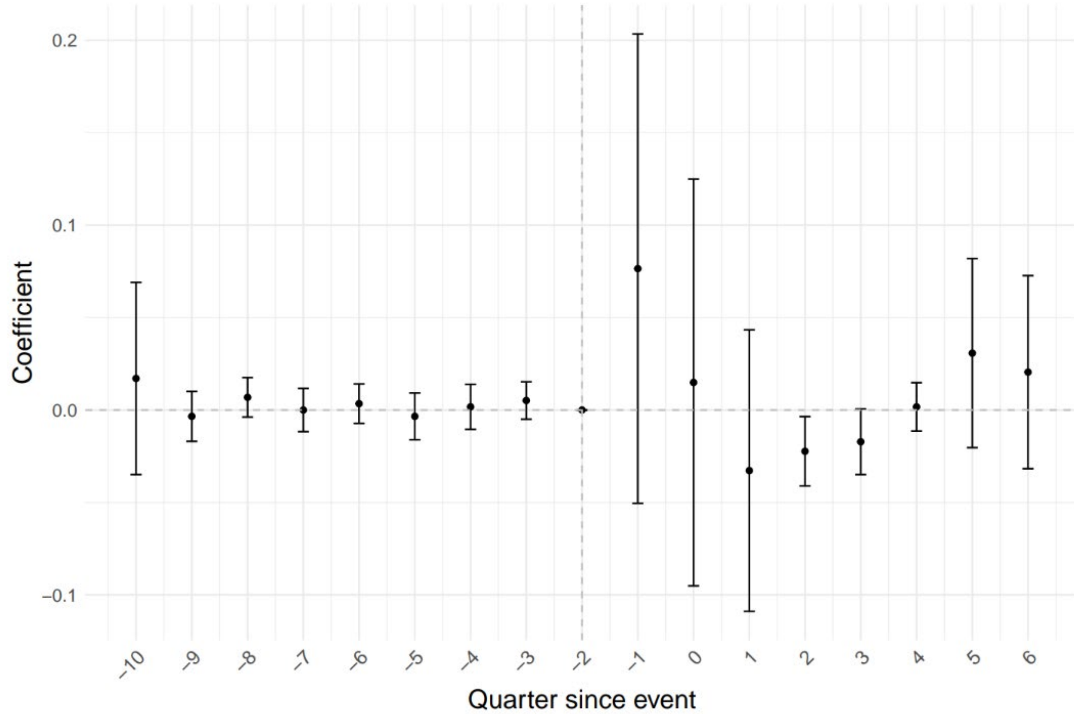


Figure 7. The estimated difference in unemployment insurance receipt between 20s workers with and without authorized user accounts from elders, derived from specification (2), after 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)

Panel A.



Panel B.

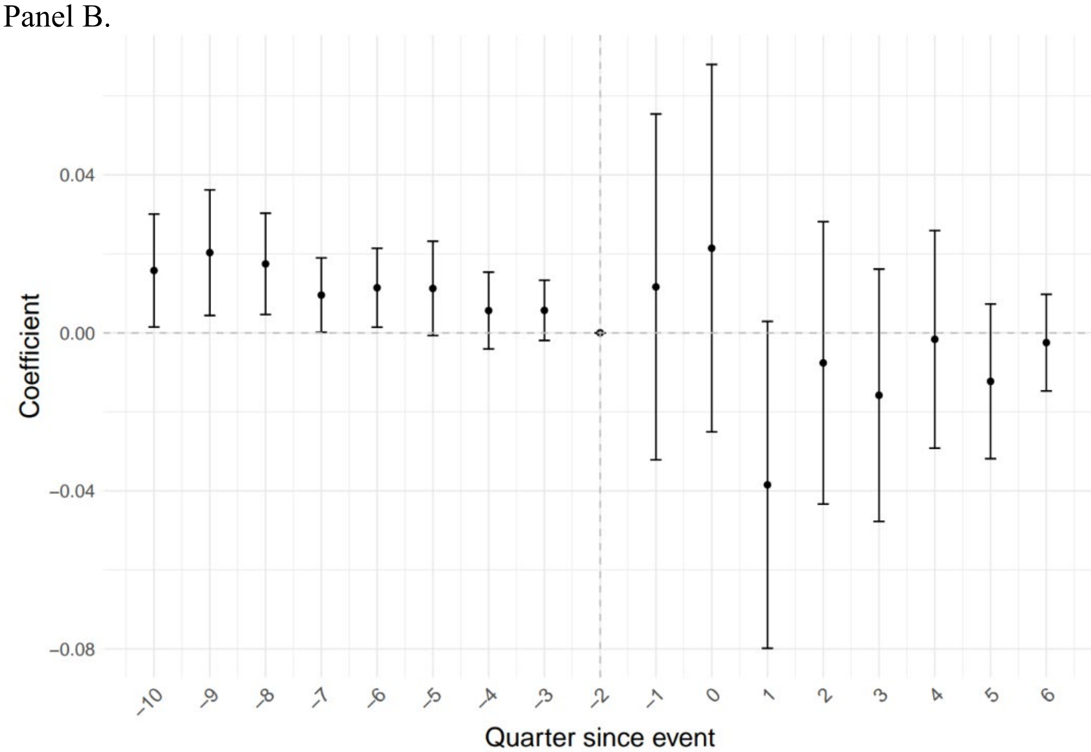


Figure 8a. Employment recovery by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

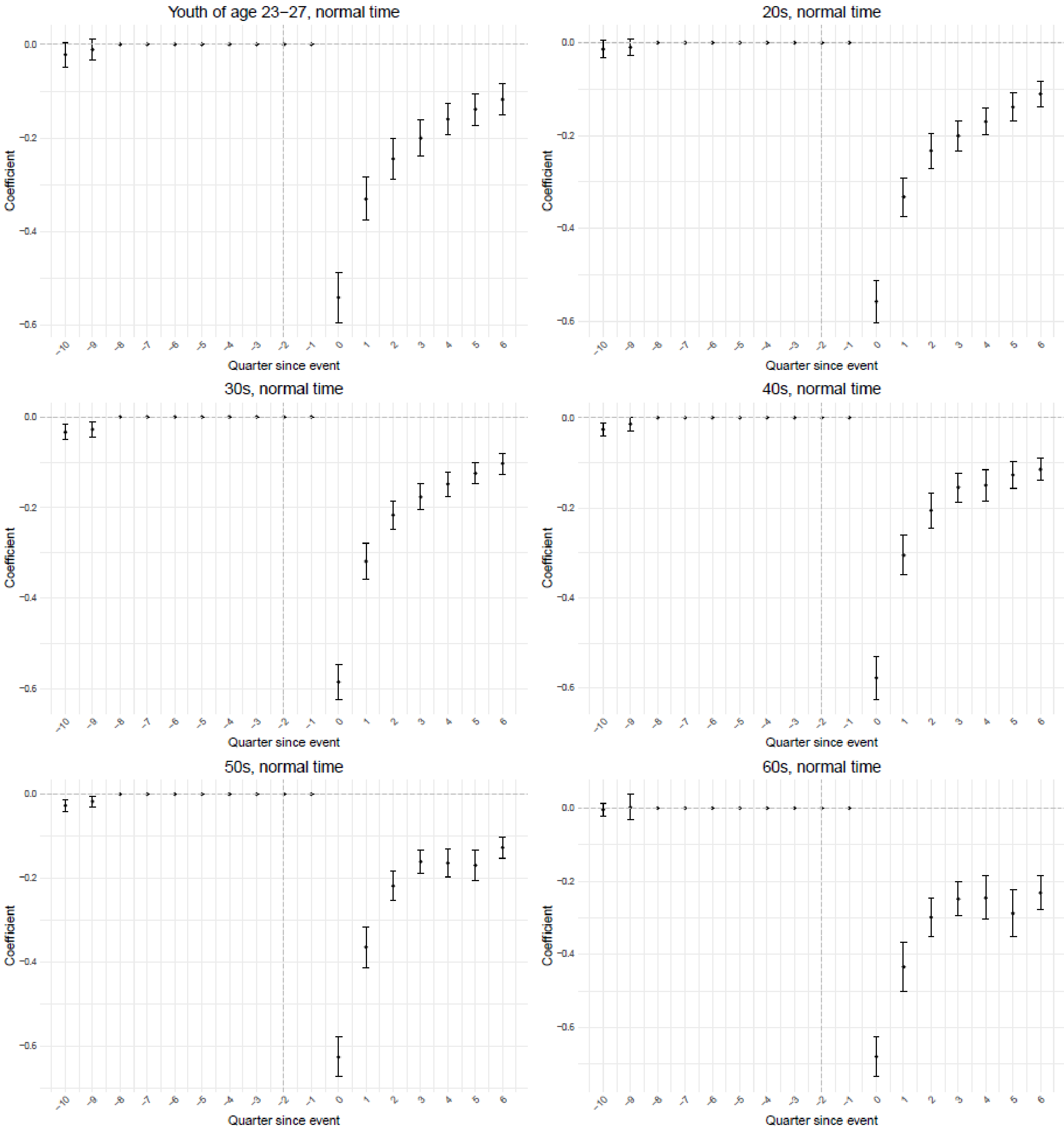


Figure 8b. Employment recovery by age group after 2020Q2 mass layoff
Difference in differences event study estimates based on expression (1)

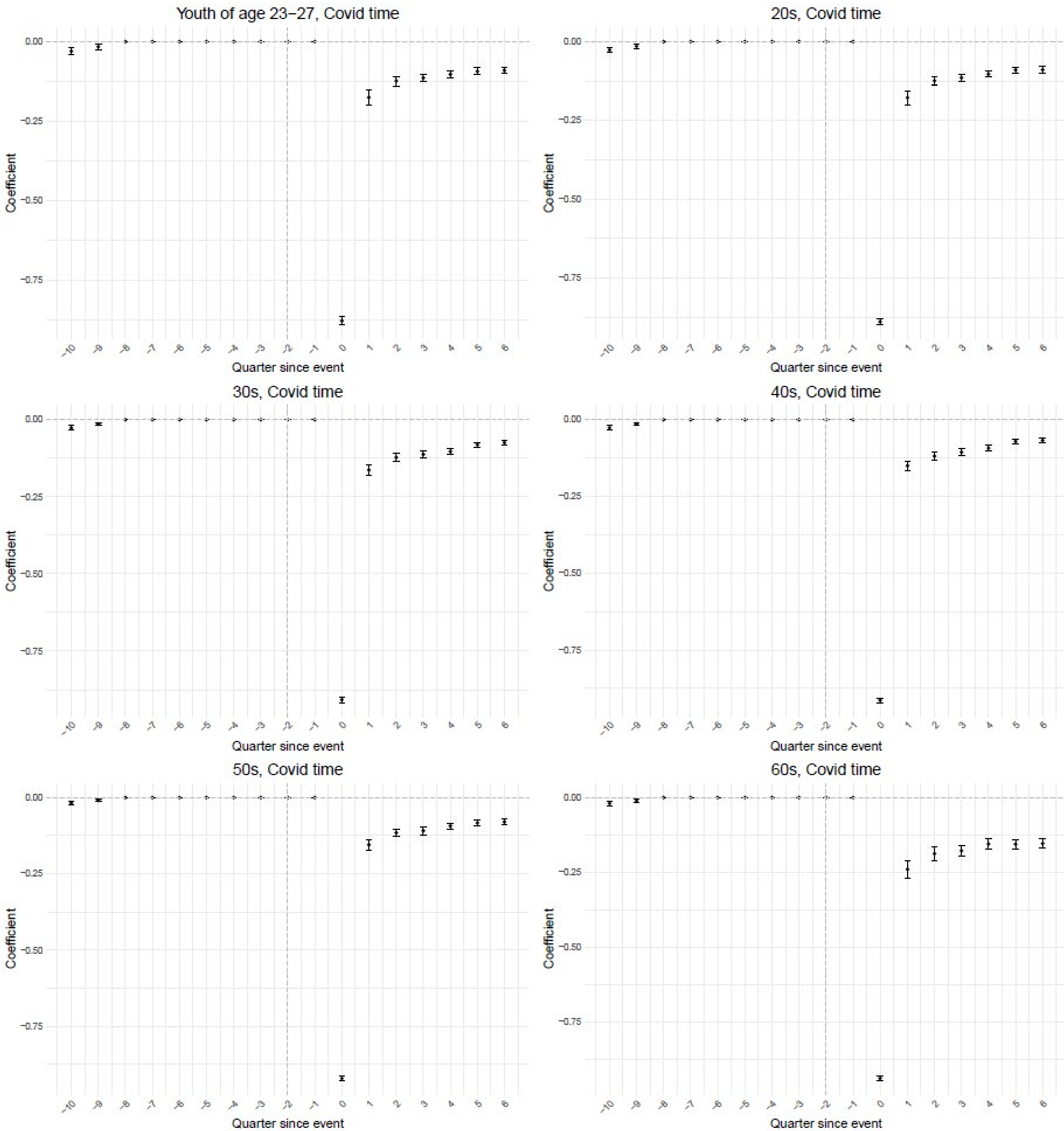


Figure 9a. Conditional log earnings estimates by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

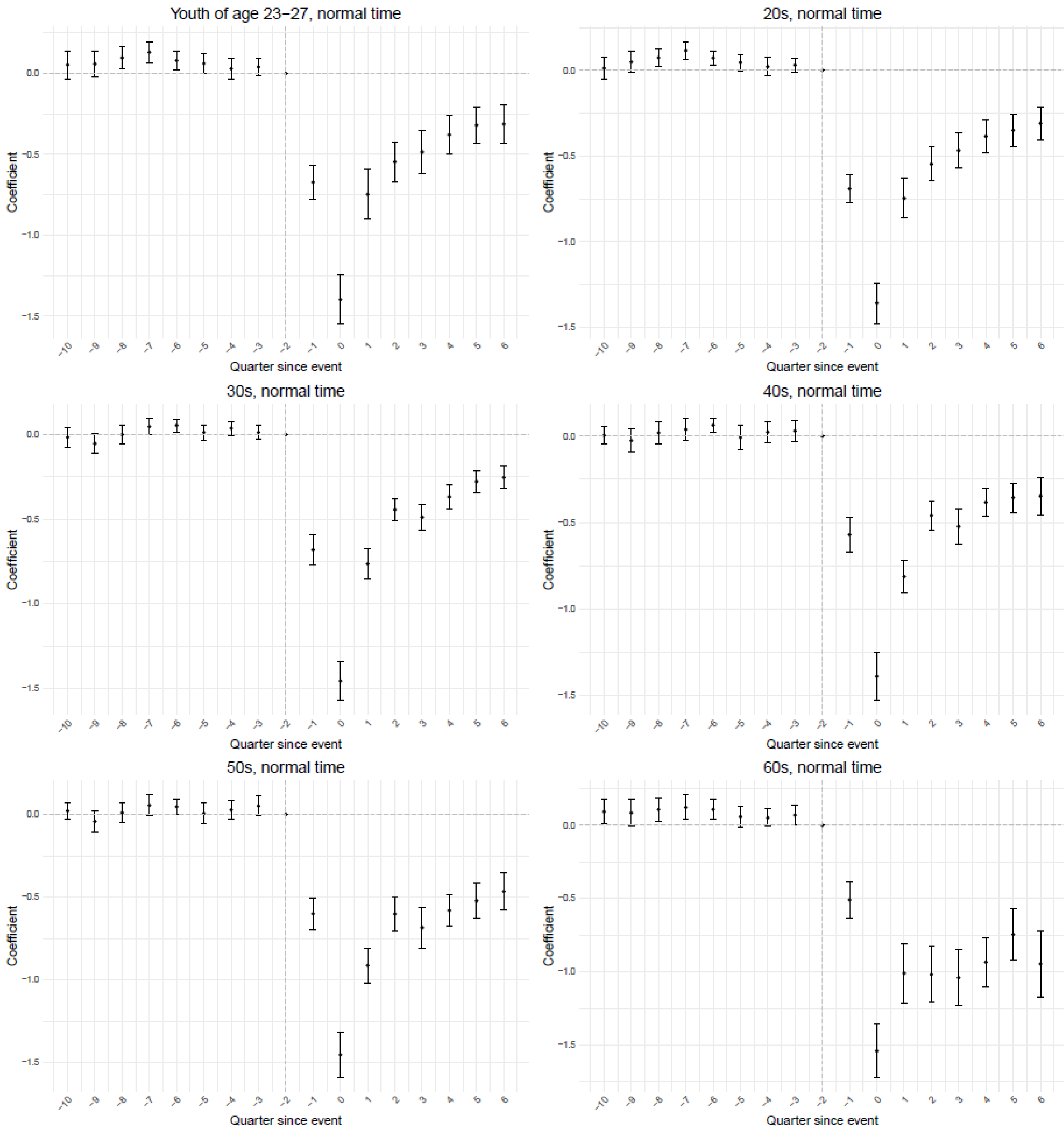


Figure 9b. Conditional log earnings estimates by age group after 2020Q2 mass layoff
Difference in differences event study estimates based on expression (1)

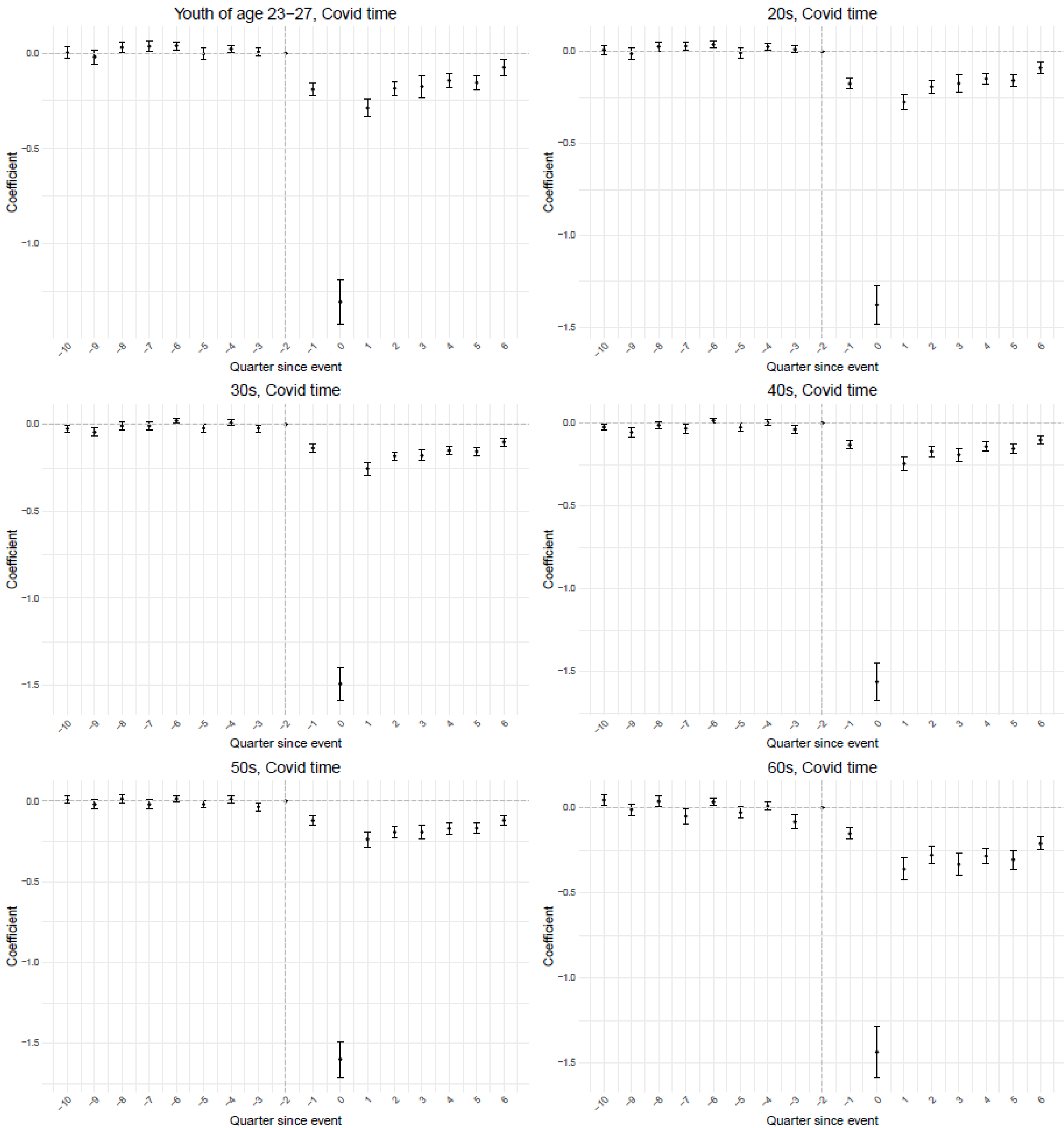


Figure 10. Credit score estimates by age group after 2018Q2 mass layoff
Difference in differences event study estimates based on expression (1)

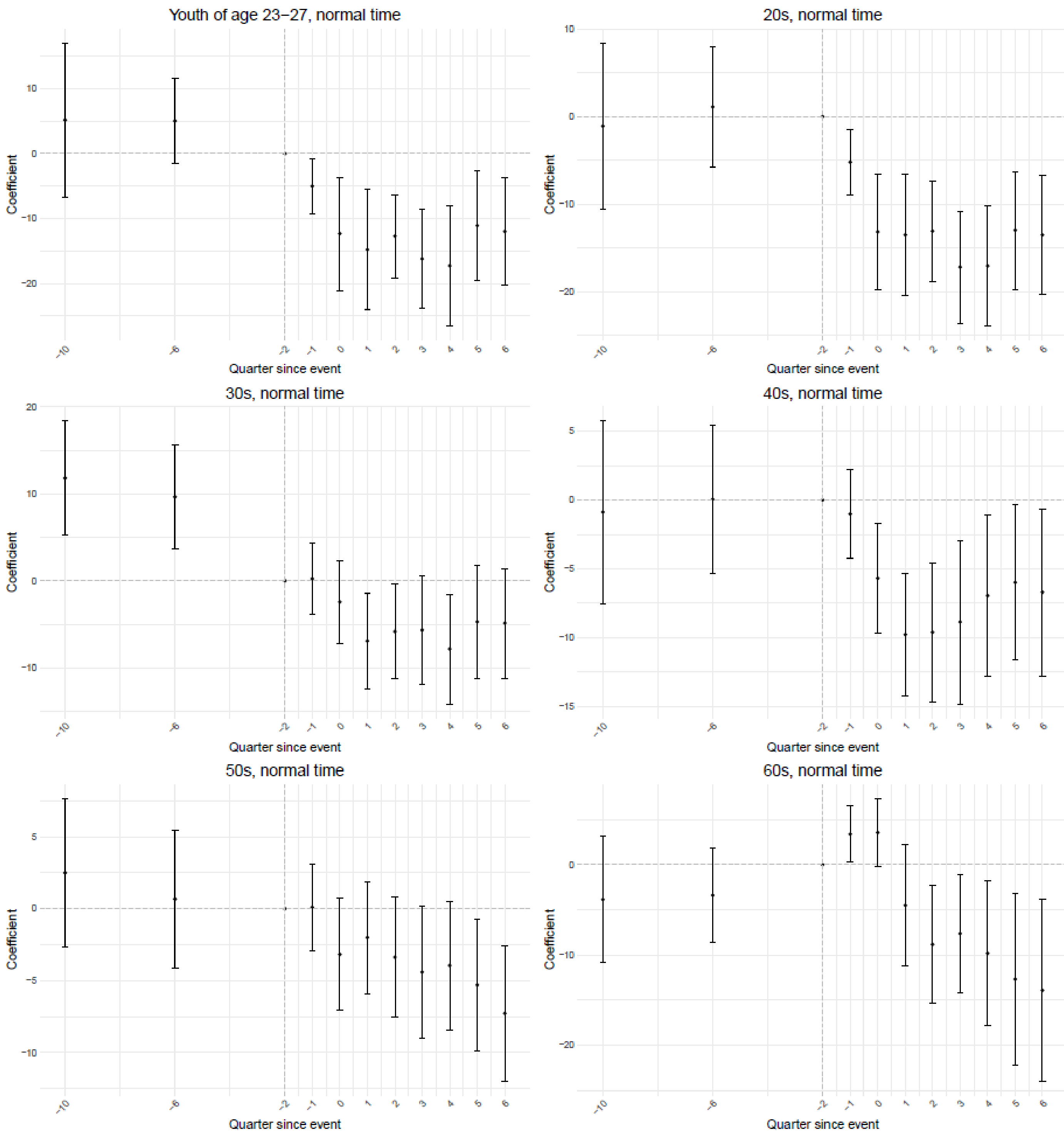
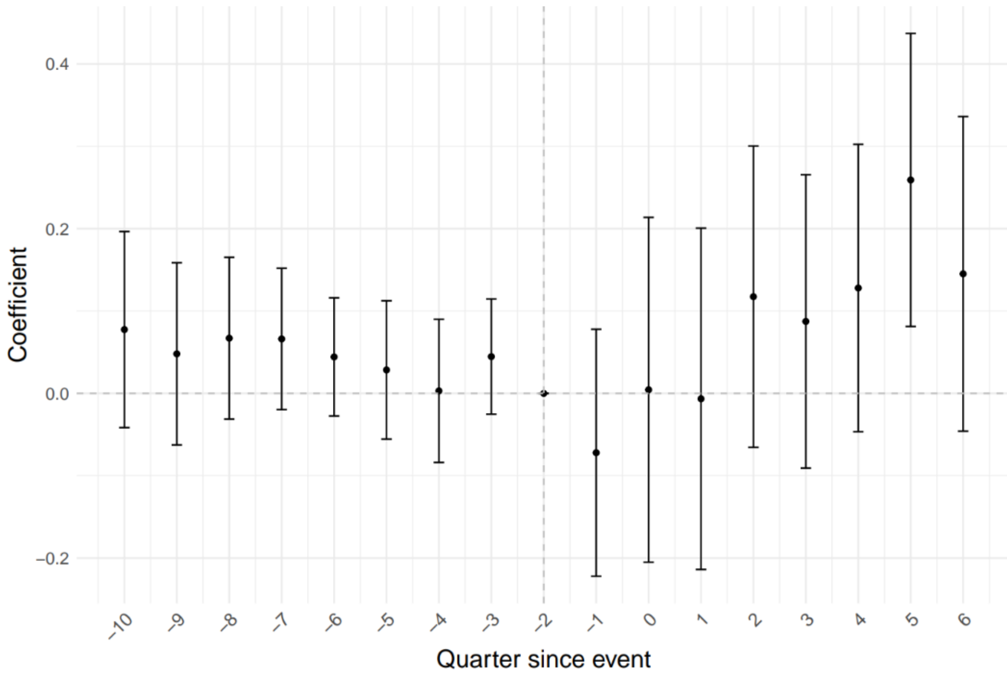


Figure 11. Earnings recovery by co-residence: Conditional earnings recovery difference between intergenerational co-residents and non-co-residents, 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)

Difference in differences event study estimates based on expression (2)

Panel A.



Panel B.

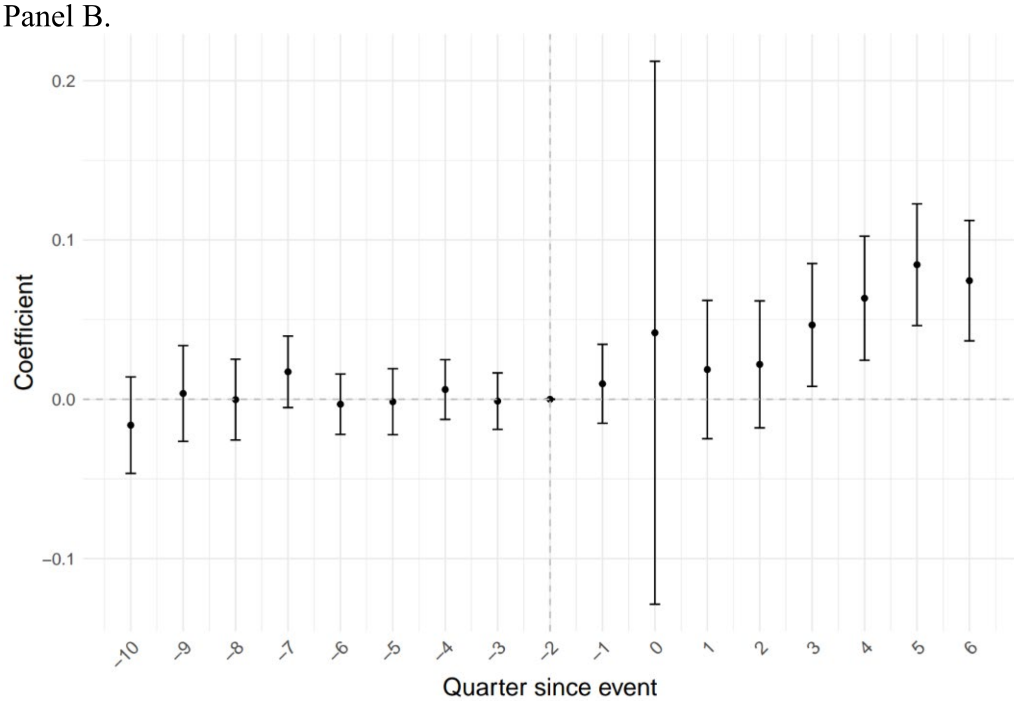
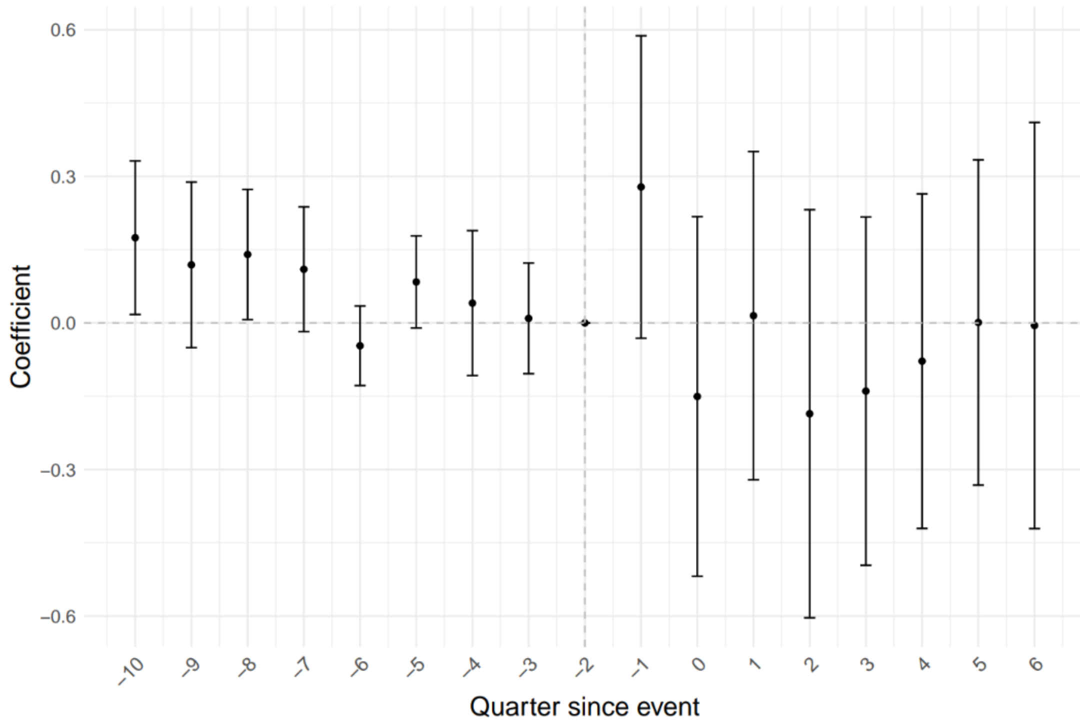
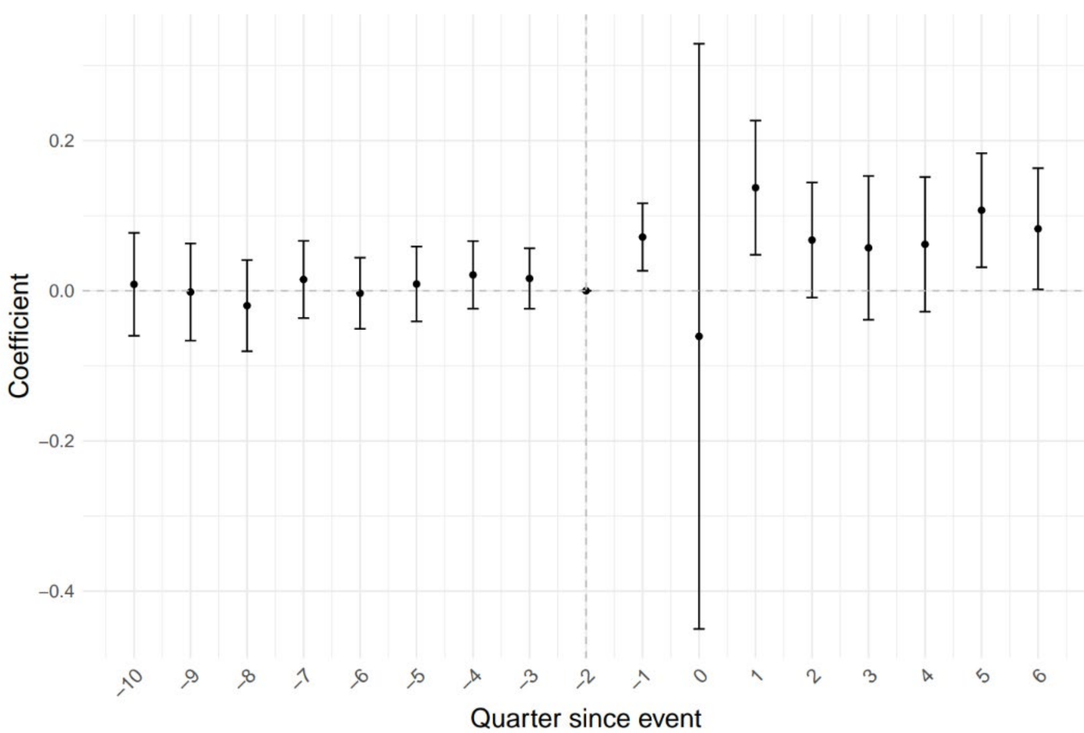


Figure 12. Earnings recovery by family AUA: Conditional earnings recovery difference between AUA recipients and non-recipients, 2018Q2 mass layoff (Panel A) and 2020Q2 mass layoff (Panel B)
Difference in differences event study estimates based on expression (2)

Panel A.



Panel B.



Tables

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

	Pre-Covid			Post-Covid		
Age	Control	Treated	All	Control	Treated	All
23-27	2,146	444	2,590	4,667	5,339	10,006
20s (23-29)	3,482	622	4,104	8,185	7,848	16,033
30s	7,149	873	8,022	16,903	10,721	27,624
40s	8,905	806	9,711	19,192	10,912	30,104
50s	9,298	757	10,055	21,893	10,552	32,445
60s	2,716	392	3,108	8,451	5,773	14,224
All	33,696	3,894	37,590	79,291	51,145	130,436

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 eight 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 workers before job displacement – all ages

	Pre-Covid				Post-Covid			
	Control	Treated	Difference		Control	Treated	Difference	
Averages								
Age	44.8	43.0	-1.8	***	45.3	43.7	-1.6	***
Quarterly earnings	15,143.8	11,818.1	-3325.7	***	16,403.8	11,195.7	-5208.1	***
% who are								
Male	53.9	49.1	-4.8	***	52.7	50.1	-2.6	***
Single	20.8	26.1	5.3	***	19.2	26.3	7.1	***
Married	60.7	52.7	-8	***	60.7	51.9	-8.8	***
Of unk marital status	18.6	21.2	2.6	**	20.1	21.8	1.7	***
% who have								
Credit scores	96.9	95.9	-1.0	**	97.2	96.8	-0.4	***
Any debt	87.6	77.3	-10.3	***	90	81.7	-8.3	***
Any card debt	75.7	61.3	-14.3	***	79.3	67.4	-11.9	***
Averages among > 0								
Credit score	682	636	-46	***	698.5	650.7	-47.8	***
Total debt	84,595	66,349.5	- 18,245.5	***	95,732.4	65,042.1	-30,690.3	***
Card debt	7,273.5	5,941.4	-1,332.1	***	7,169.5	5,732.1	-1,437.4	***
20s only: % who are								
AUA recipients	6.8	6.3	-0.5		8.5	6.4	-2.1	***
Co-residents	51	56.1	5.1	**	47.6	52.6	5	***

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

2-digit		Pre-Covid		Post-Covid	
NAICS	Description	Control	Treated	Control	Treated
11	Agriculture, Forestry, Fishing, Hunting	0.5	0.4	0.5	0.0
21	Mining, Quarrying, Oil & Gas Extract.	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	Profess'l, Scientific, & Tech. Services	4.5	5.1	4.1	3.2
55	Mgmt. of Companies & Enterprises	2.2	1.1	1.3	1.3
56	Administrative, Support, Waste Management, & 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 (no Public Admin.)	2.7	0.9	2.5	3.4
92	Public Administration	2.0	0.4	2.0	0.2

Appendix A. Theoretical framework relating employment, intergenerational co-residence, and unemployment insurance take-up

Existing models in the literature consider workers' endogenous choices of coresidence with parents (Kaplan, 2012) and unemployment insurance (UI) take-up (Auray et al., 2019; Auray and Fuller, 2020; Blasco and Fontaine, 2021) but not both. We describe a simple theoretical framework to illustrate the tradeoffs young workers face when they simultaneously choose employment, residence, and UI take-up. The main insight from the model is that workers' optimal responses to labor market shocks depend on whether those shocks are idiosyncratic or correlated. When young workers receive idiosyncratic negative shocks to their market wages, they are more likely to return home to seek reemployment there and less likely to claim UI benefits. When young workers face common negative shocks to wages across markets, they are more likely to stay independent and more likely to claim UI benefits.

Model. Consider a young worker (they) facing the following choices in each period $t = 1, 2, \ldots,$ and so on. They may live away from home ($a_t = 1$) or live at home with his parents ($a_t = 0$). They may work ($e_t = 1$) or not work ($e_t = 0$). If they do not work, they may claim UI benefits ($b_t = 1$). Otherwise, they do not claim UI benefits ($b_t = 0$). In sum, the young worker has six possible actions:

1. living away from home while working,
2. living away from home while not working and claiming UI benefits,
3. living away from home while not working and not claiming UI benefits,
4. staying at home with one's parents while working,
5. staying at home with one's parents while not working and claiming UI benefits, and
6. staying at home with one's parents while not working and not claiming UI benefits.

The young worker's payoff in period t consists of their earnings, UI benefits, and transfers from parents minus his disutility from working, living away from home, and claiming UI benefits. Specifically, let w_{0t} and w_{1t} denote the worker's market wages in period t at home and away from home, respectively, following exogenous stochastic processes. The interpretation is that living away from one's parents give one access to a different job market, thus a different market wage. Let θ denote the fraction of market wages they receive as UI benefits if they claim them. The parameter represents the generosity of the UI system. Let τ_t denote the amount of transfers (financial support) they receive from their parents, as an exogenous stochastic process. Let γ_e, γ_a, and γ_b, denote the disutility from working, living away from home, and claiming UI benefits, respectively. The sources of such disutility are, for example, the lost leisure due to employment, the rental expenses of living away from home, and the burden of paperwork to claim UI. At every point in time t, the worker chooses an action (a_t, e_t, b_t) to maximize their payoff:

$$u_t = [w_{0t}(1 - a_t) + w_{1t}a_t](e_t + \theta b_t) + \tau_t - \gamma_a a_t - \gamma_e e_t - \gamma_b b_t.$$

Note that the worker's effective wage is $w_{0t}(1 - a_t) + w_{1t}a_t$, which depends on where they live. If they work, they receive this amount. If they do not work and claim UI benefits, they receive a fraction θ of this amount.

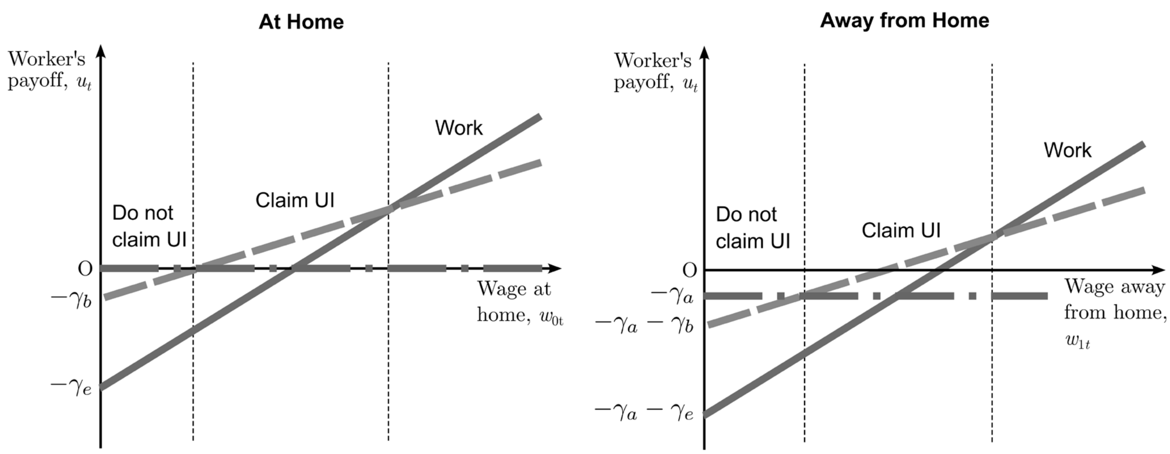


Figure 1: Workers' payoffs as functions of wages, employment, residence, and UI take-up

Remarks on the model. Our model has limitations as it abstracts away from aspects of workers' reality for tractability. First, the worker behaves myopically, choosing their action to maximize their payoff in each period. One could relax this assumption by letting the worker maximize the discounted sum of their present and future payoffs. One could further assume that the wages w_{0t} and w_{1t} are persistent stochastic processes, so that the worker can predict to some extent their future wages from past values. This revised model would result in similar medium- to long-run predictions as our benchmark model.

Second, we do not explicitly model the dynamics of involuntary job losses and uncertain job search. Instead, we let workers choose employment with certainty, while interpreting exogenous movements in the wages as job losses and arrivals. For example, an involuntary job loss is described by a large negative shock in the worker's wage.

Third, the model abstracts away from usual eligibility requirements of unemployment insurance systems, such as minimum period of previous employment, minimum amount of wages previously earned, and maximum period of receiving benefits. Instead, we interpret the parameter θ of UI generosity to roughly capture all such constraints. For example, if a worker is ineligible to claim UI, the parameter θ takes a value close to zero.

Results. Figure 1 shows a young worker's payoffs as a function of their wages and actions, while normalizing the parental transfer to zero. When a worker lives at home, not claiming UI gives them zero payoffs regardless of the wage. If they do not work and claims UI benefits, their payoff increases gradually as their wage at home (w_{0t}) increases; the higher the UI generosity θ, the steeper the slope. If they work, their payoffs increase one-to-one as their wage increases. Because the worker finds claiming UI and working inconvenient, their optimal action depends on the wage. If it is in the low range, their optimal action is to not work and not claim UI. If the wage is in the middle range, their optimal action is to not work and claim UI. If it is in the high range, their optimal action is to work. They face similar tradeoffs and optimal actions when they live away from their parents (right panel), as a function of their wage away from home (w_{1t}). The difference is that they face disutility from living away from home, so all of their payoffs are lower by that amount compared to staying in their parental home.

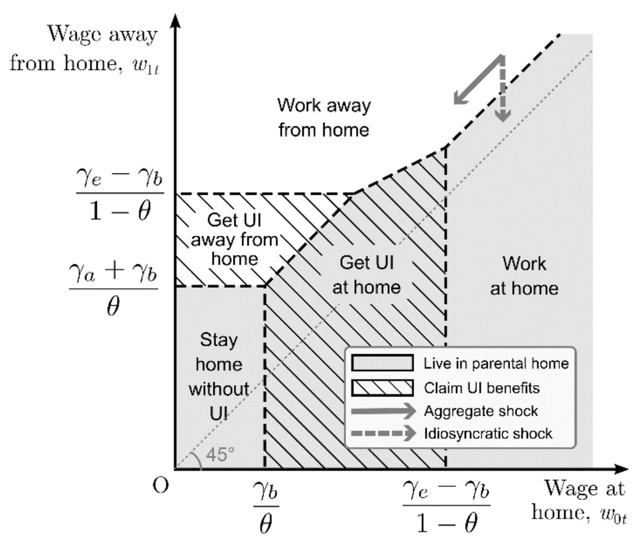


Figure 2: Workers' optimal actions

Given their market wages at and away from home, the worker chooses the best option among the six possible actions to maximize their payoff. Figure 2 shows these optimal actions as a function of the two wages w_{0t} and w_{1t}. When the wage away from home is sufficiently high, the worker chooses to live independently from their parents and work at a high-paying job away from home. When the wage in their parents' neighborhood is sufficiently high, the worker chooses to live with their parents while working. When both wages are high, the worker chooses to work to live independently only if difference between the two wages exceeds their disutlity from living away from home. When both wages are low, the worker chooses to stay home. When both wages are in similarly in middle range, the worker takes a break at their parental home to receive UI benefits. If both wages are in the middle range but the wage away from home is significantly higher, the worker claims UI while resting away from home.

Using this result, let us consider how a typical young worker living away from home would respond to idiosyncratic shocks to their market wages. Suppose a young worker faces high wages both at and away from home, with a significant premium on the former. Such worker lives away from home working, and is represented by a point on the top-right corner of Figure 2 at the arrows' origin. Consider an idiosyncratic shock that pushes down their wage away from home and destroys their job, indicated by the dashed arrow pointing down. If the shock is small, they would seek another job where they currently lives. However, if the shock is large enough, they would return home to seek a new job there. Either way, they will seek quick reemployment rather than receiving UI benefits for a long time.

In contrast, suppose a young worker with the same initial wages experiences a job loss with an aggregate shock: a correlated shock that brings down wages both at and away from home. Such shock is represented by the solid arrow pointing toward the origin. Because all wages are down, the worker cannot simply return home to find a better-paying job. Instead, they would seek reemployment where they currently live at the lower wage, as long as the drop is not too large. However, if the shock is sufficiently large, seeking reemployment becomes less attractive than taking a break receiving UI benefits. Depending on whether there remains a significant wage premium away from home, the worker may stay living independently or return home altogether.

All in all, although our stylized theoretical framework abstracts from many aspects of reality facing young workers, it provides a couple of clear qualitative predictions about how young workers would respond in times of individual and social crises. During normal times, young workers experiencing job losses are more likely to return home and less likely to claim UI benefits, as they tend to seek reemployment in the neighborhoods of their parents' homes. In comparison, during social crises such as the 2020 COVID-19 pandemic, young workers experiencing job losses display less of an increase in their odds of returning home, relative to workers not experiencing job losses, and are more likely to claim UI benefits, because they cannot easily find comparable jobs either in their own or parents' neighborhoods.