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Abstract

We establish seven facts about temporary layoffs (TL), whose employers communicated an anticipated recall date at layoff: (1) The higher the current TL share at firm/industry-level, the higher (lower) the future recall (layoff) likelihood for both temporary and permanent layoffs (employees); (2) TL is more prevalent in: the upper-middle part of the wage distribution, (3-4) in mass layoffs and recessions; (5) The later the communicated recall date, the lower the accepted new-job wage, unconditional and conditional on non-employment duration; (6) TLs' new-job hazard rate (wage) jumps (drops) when recall likelihood falls; (7) Extending unemployment benefits increases separations in recall-intense sectors.

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Seven Facts about Temporary Layoffs*

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Abstract

We establish seven facts about temporary layoffs (TL), whose employers communicated an anticipated recall date at layoff: (1) The higher the current TL share at firm/industry-level, the higher (lower) the future recall (layoff) likelihood for both temporary and permanent layoffs (employees); (2) TL is more prevalent in: the upper-middle part of the wage distribution, (3-4) in mass layoffs and recessions; (5) The later the communicated recall date, the lower the accepted new-job wage, unconditional and conditional on non-employment duration; (6) TLs' new-job hazard rate (wage) jumps (drops) when recall likelihood falls; (7) Extending unemployment benefits increases separations in recall-intense sectors.

Firms need to reduce their workforce when facing demand or productivity shocks. If the reduction is expected to be temporary, an eventual rehiring of the same worker allows the firm to avoid hiring costs, the worker to avoid search costs, and to keep potential firm-specific human capital. However, laid-off workers might not wait. For over a century, a solution has been for firms to communicate their beliefs about the temporary nature of the separation, thus creating an expectation by the worker of being rehired (Floud et al. [2014]). A considerable share of layoffs are ex ante temporary and the majority of such temporary layoffs indeed exit unemployment ex post by being recalled (Feldstein [1975], Katz [1985, 1986], Katz and Meyer [1990b], Nekoei and Weber [2015]). The prevalence of temporary layoffs appears to be stable in the long-run (Appendix Figure 1).

Temporary layoffs (TL) differ substantially from permanent layoffs (PL), as they search less but exit unemployment faster (Katz and Meyer [1990b] Nekoei and Weber [2015]). Recalled workers tend to receive their pre-unemployment wages, avoiding the usual post-layoff wage loss (Katz and Meyer [1990b], Nekoei and Weber [2015], Fujita and Moscarini [2017]). Prior literature has pointed out that the existence of temporary layoffs has large consequences

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for the search theory of unemployment (Feldstein [1976], Fujita and Moscarini [2017]), but basic facts in the debate are still missing. The current paper aims at filling this gap.

We use unique administrative data from Austria where the type of layoff – TL or PL – is recorded for all job separations during the period 2004-2013. The novel aspect of our data is that it includes the expected rehiring date. To be considered as TL, unemployed workers are required to provide a written document specifying a projected date for rehire. This data is then matched to the social security and unemployment registers, which contain information on daily wages, exact employment spells, and unemployment benefits receipt.

We establish seven facts about the nature of TL and recall: (i) The higher the share of TL among layoffs of a firm or industry, (a) the higher the likelihood of any layoff, both temporary and permanent, to be recalled, and (b) the lower the future layoff likelihood of employees; (ii-iii) TL shares and recall rates conditional on TL are higher in the upper-middle part of the wage distribution, (or of the AKM individual fixed effects distribution (Abowd et al. [1999])), and most of variation comes from the observed part of the wage; (ii-iii) TL shares and recall rates conditional on TL are higher when more workers are laid off simultaneously; (iv) Recessions are accompanied by higher recall shares, mainly due to higher recall rates conditional on layoff type, rather than higher TL shares; (v) Most recalls happen around a communicated recall date. One half of TLs who are not recalled but still unemployed on the communicated recall date never find a job, implying an early sorting of TLs relative PLs. The further out the communicated recall date, the lower the accepted new-job wage if one is found, unconditional or conditional on non-employment duration; (vi) During an unemployment spell, the hazard of new-job jumps and the accepted new-job wage drops when the recall likelihood falls, either on the recall date or after recall of a former colleague; and (vii) Extending unemployment benefits increases separations in recall-intense sectors. In addition to these seven facts, comparing two layoffs of the same worker, we detected no relationship between TL likelihood and within-individual inferred match quality.

A framework emerges from these seven facts: TL is used when firms face perceived temporary shocks for workers who are difficult to replace at the same wage. This includes workers with high intrinsic or accumulated match-specific quality. Most recalls happen around the communicated recall date, and workers wait for it: they are more selective, search less, and are thus less likely to exit unemployment before the recall date. If not recalled, this wait is costly due to negative duration dependence. Knowing that, TLs wait less when the likelihood of being recalled is low and the communicated recall date is late. The target wage drops and job finding rates increase once the recall date is passed and they are not recalled, suggesting a belief updating. However, recall is very selective, so that the employment prospect of those who are still unemployed after their recall date is dire: it can lead to lower wage jobs, if not a permanent exit from the labor market. Waiting for recall is costly, and this cost is higher, the longer the waiting period, i.e. the further the anticipated recall date from the layoff date.

The structure of the paper is as follows: Section 1 describes the data and section 2 illustrates the seven facts. Section 3 concludes the paper.

1 Data and empirical setting

We use unique administrative data on hiring promises and expected hiring dates recorded by the Austrian employment office. In many countries, including the U.S., unemployed workers are explicitly asked about their expectations to be hired upon arrival at the employment office (Katz and Meyer [1990a]).[1]

The novel aspect of our data is that it includes the expected rehiring date. In Austria, workers are encouraged to bring a document stating an informal notice of hiring intention and projected hiring date.[2] The written intention is not binding for either party, but is aimed to better target job search assistance resources at the employment office.[3] The letter can thus serve the worker to avoid extra search and training costs, which might have a low expected return. From the employer's perspective, the letter helps to increase the likelihood of retaining valuable workers and avoiding additional hiring and training costs, if it can be used as a credible signal that increases the chance of workers waiting for the recall. The latter explains why employers do not promise a recall to all layoffs.

The rehiring records from the Austrian employment office can be matched to the Austrian Social Security Database (ASSD) and the unemployment registers, which contain information on daily employment, unemployment, earnings and unemployment benefits for the universe of individuals employed in the private sector.

The main estimation sample is constructed by merging all individuals aged 20-60 who enter unemployment within 40 days after leaving a job with at least 90 days of tenure from ASSD with unemployment benefits and hiring promises records. Each unemployment spell with a matched hiring promise is defined as a TL, while the remaining spells are labeled as PL. Our final sample includes 3,882,584 unemployment spells and covers the period of 2004-2013 when the hiring promise records are available. This is the same sample as used in Nekoei and Weber [2015]. However, in parts of Facts 6 and 7, and in order to increase statistical power, we use the data starting from 1980, the sample used in Nekoei and Weber [2017]. This comes with the cost of not having the information about layoff type.

[1] In addition to the administrative data from employment offices, labor surveys, like CPS used in Appendix Figure 1, sometimes ask unemployed individuals about their expectations of future recall.

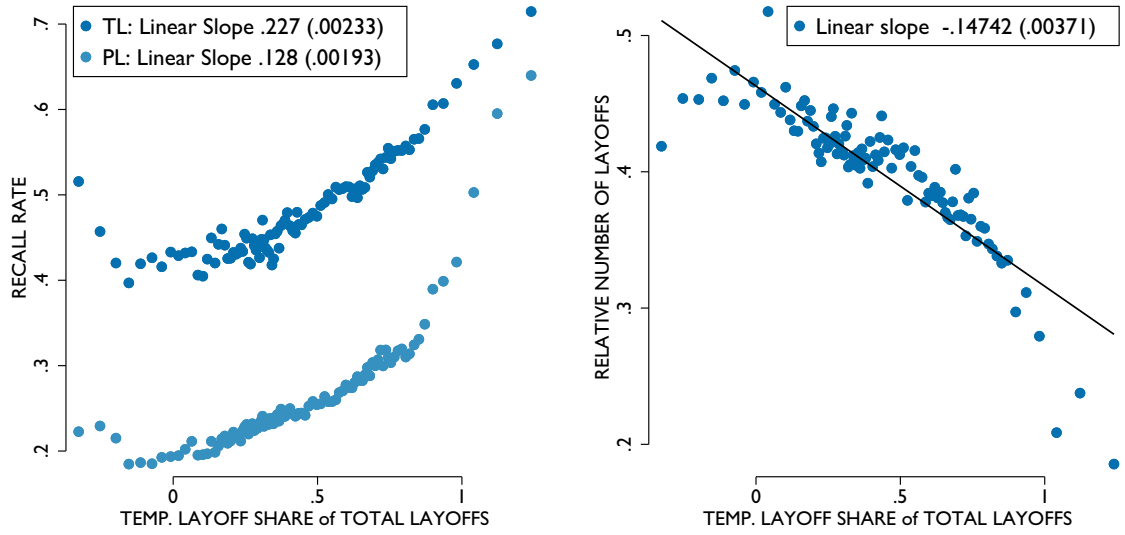
[2] This document can either be from the former employer or any other prospective employer. Strong evidence indicates that, in most cases, such document is issued by the pre-unemployment employer (Nekoei and Weber [2015]).

[3] Some Austrian employment offices do not offer any assistance to temporary layoffs, while others offer them meetings with caseworkers and job referrals, but at a lower rate than for permanent layoffs.

Figure 1: Current TL shares and future recalls and separations (Fact 1)

(a) Recall of laid-off workers

(b) Layoff of employed workers



Note: A 100-binned scatter plot of the relationship between (a) the recall likelihood by layoff type, temporary layoffs (TL) or permanent layoffs (PL), (b) the ratio of the number of layoffs in the next six months relative to the current month against the current TL share among laid off workers at the firm in the current month. Controlling flexibly for layoff size, the interactions of industry, region, and calendar month (seasonality).

2 Seven facts

2.1 Fact 1: TLs informative about future employment prospects of both employed and unemployed workers

In our sample, 42% of all layoffs are TLs, while 58% are PL. Within the first year after layoff, 82% of TLs will be reemployed: 58p.p. by being recalled, and 24p.p. with a new employer. For comparison, 69% of PLs will be reemployed within one year: 19p.p. by being recalled, and 50p.p. with a new employer (Appendix Figure 2). For the individual worker, being on TL relative to PL implies a 40 percentage points (p.p.) higher likelihood of recall, i.e. returning eventually to her pre-unemployment job.

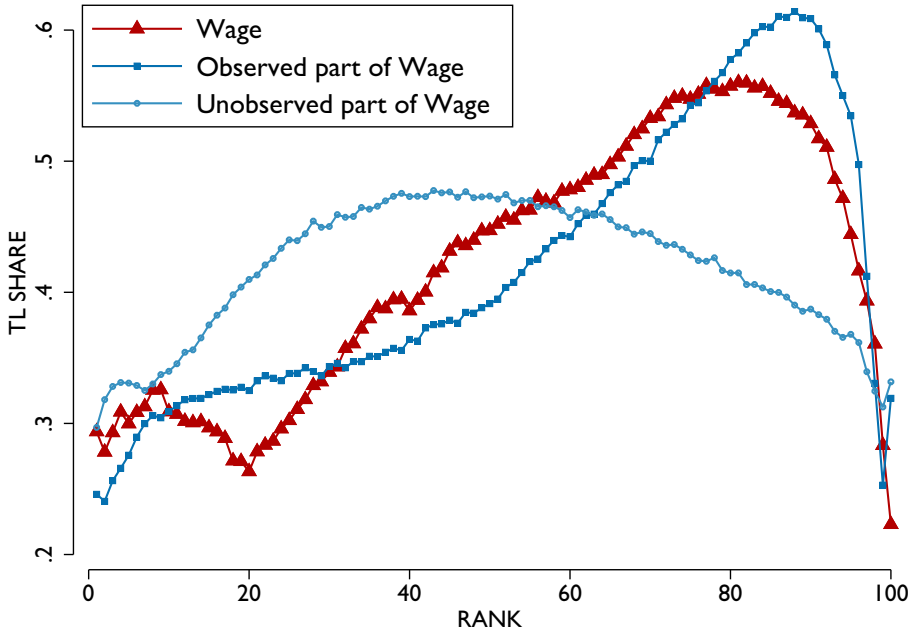
Beyond the signaling value of the individual layoff notice, the share of TL at the firm- and industry-level also incorporates important information. First, a higher share of TL in a worker's firm or industry reflects a higher chance of recall for *both* TLs and PLs. Figure 1 panel a investigates the relationship between the likelihood of recall of a worker and the average TL share of her layoff cohort at the firm-month-level. It shows that the recall likelihood is not only a function of individual layoff type, TL vs. PL, but also varies dramatically with the TL share at the firm level. For example, the recall likelihood of a TL (PL) individual is 2.2 (1.2) p.p. higher for each 10 p.p. higher TL share in her layoff cohort, keeping the size of layoff cohort constant. For industry level results see Appendix Figure 3.[4]

[4]Appendix Table 1 further investigates the issue using regressions controlling for layoff size and seasonality

Second, a higher TL share of layoffs is associated with a lower layoff levels during the following six months both at the firm and industry level. Figure 1 panel b investigates the relationship between the share of TL among the laid-off workers and future layoff rate of current still-employed workers from a given firm. If the share of TL is related to the employer prediction of the future of the business, we would expect that TL share is negatively correlated with future separations. This is indeed what we find. For instance, if the share of TL increases by 10 p.p., the growth in the number of separations during the next six months is approximately 1.5 p.p. lower.[5] Industry-level results show similar patterns, see Appendix Figure 4.

In sum, the first fact shows that the TL share at the firm or industry level is positively associated with the future employment prospect of its workers. This suggests that the employer's decision of layoff type – TL vs. PL – is a proxy for the employer's forecast with respect to the future of the business. This is useful in practice since most Employment Offices record whether a layoff is temporary in their administrative datasets, similar to the Austrian data that this paper uses.

Figure 2: TL pattern by employee type (Fact 2)



Note: For each percentile of the wage distribution, the TL rate is shown (red triangles), as well as the observed part of wage (larger and filled dark blue squares), and the unobserved part of wage (smaller and empty light blue squares). Wage refers to average daily wage in pre-unemployment job during the last calendar year. The observed (unobserved) wage is the predicted (residual) part of the wage in Mincer-type regressions with the following controls: size of layoff, region, 3-digit industry code, tenure, experience; as well as all interactions of age, education, gender, marital status, and Austrian citizenship; experience and blue-collar indicator; tenure and age. The R2 of this regression is .45, with 3.8m observations and around 1,200 fixed-effects. For similar analysis using AKM individual fixed effects see Appendix Figure 6.

(the interactions of industry, region, and calendar month).

[5]Here again, the regressions are controlling for layoff size and seasonality (the interactions of industry, region, and calendar month).

2.2 Fact 2: TLs are more prevalent among the upper-middle part of the wage distribution

The second fact concerns the prevalence of TL and recall by wage in the cross-section. We find that the TL share of layoffs has an inverse-U shape with a peak at the 80th percentile of the wage distribution (Figure 2). Wage is the average daily labor income in the calendar year of layoff. It is constructed by dividing the annual earnings from the pre-unemployment employer by the number of days worked for that employer.[6]

The inverse-U shaped TL pattern is present, even exaggerated, when we focus on the observed part of wage (Figure 2). The observed wage is estimated as the predicted wage of a flexible Mincer-type regression, where we use all dependent variables in our data which are observable by employers (See the note of Figure 2 for details). The unobserved wage is the residual of this regression. The TL share also has an inverse-U shaped pattern with respect to the unobserved part of wage, but with a relatively lower peak at around the 40th percentile of the wage distribution.[7]

Theoretically, we expect that workers who are difficult to replace at the same wage will be on TL. This includes three cases: First, when there is an intrinsic match value, e.g. the worker is especially productive at the current firm. In this case, TL will help to avoid the destruction of the match and reduce future hiring costs. Second, when the accumulated match quality, e.g. firm-specific human capital through either training or learning by doing, is high.[8] Third, where one of the parties has private and costly-to-acquire information about the other party.

One interpretation of the pattern observed is that higher-wage workers are more difficult to replace at the same wage, because of either channels discussed above. To shed some light on this, we decompose wages using the so-called AKM specification à la Abowd et al. [1999]:

$$w_{iJ(i,t)} = \delta_i + \delta_{J(i,t)} + \delta_t + \beta A + \varepsilon_{iJ(i,t)t} \tag{1}$$

where i indicates individual, $J(i,t)$ the firm in which i is working at time t, so that $w_{iJ(i,t)}$ denotes her log daily wage. We follow the Card et al. [2018] specification in adding the age polynomial as a control, the term A in the regression.

Appendix Figure 6 panel a shows the relationship between TL and the individual fixed effect, as a proxy for individual quality. Panels b and c of this figure investigate the observed and unobserved part of the individual fixed effect, similar to Figure 2. The patterns are similar when raw wages are used (Figure 2). This suggests that the inverse U-shaped TL pattern reflects individual quality, rather than wages of the current job.

[6] See Nekoei and Weber [2017] for more details.

[7] Appendix Figure 5 shows similar inverse-U shaped pattern of unconditional recall rates, and the same rate conditional on layoff type.

[8] Note that the accumulated match quality needs not be always positive. For instance, if workers can accumulate bargaining power over time, this leads to a negative accumulated match value from the employer perspective.

An interpretation of the inverse U-shaped patterns is that there are two countervailing forces at play here: on the one hand, higher-skilled workers are more costly to replace (e.g. a higher amount of firm-specific human capital); on the other hand, the opportunity cost of waiting for recall is higher for higher-wage workers.

A potential interpretation of the difference between TL patterns of observed vs unobserved parts of both wage and AKM individual fixed effect is that the employer's decision to issue a TL is more about match quality and less about private information: The match-quality, e.g. based on firm-specific human capital, plays a more important role in the upper-middle part of the wage distribution.

2.3 Fact 3: TLs are more likely to occur in mass-layoffs.

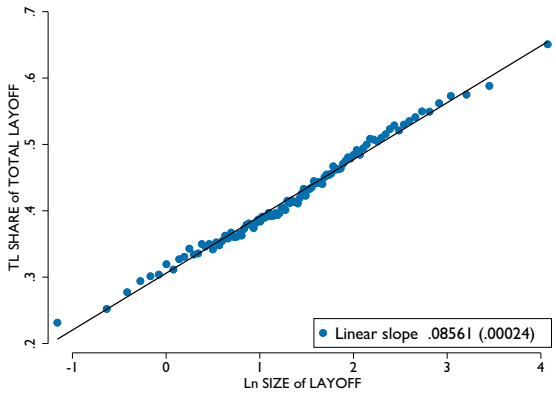
If TL occurs when a firm is facing a perceived temporary productivity or demand shock, then we expect to have a higher TL share in larger size layoffs. In fact, the TL share is higher in larger layoffs, varying from an average of 24% for layoffs including only one worker to 71% in mass layoffs, displacement of more than half of the workers in a firm (Appendix Figure 7 Panel a). The recall rate conditional on layoff type is also increasing by layoff size.

The relationship between TL and layoff size holds even after controlling for the business cycle and worker characteristics. Figure 3 Panel a shows the TL share by layoff size, where we control flexibly for firm size, wage, tenure, location, layoff time interacted with industry; age , education, gender, marital status, blue collar all interacted with each other.

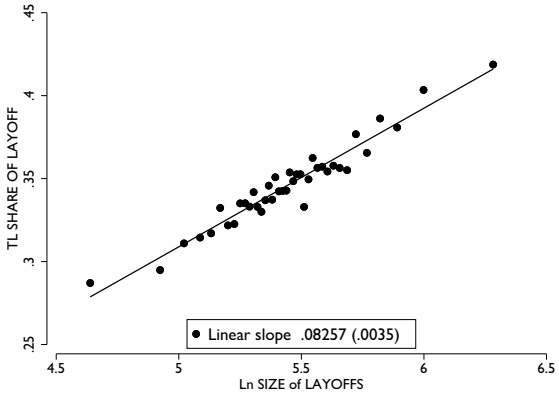
An interpretation of this pattern is that since smaller layoffs include less TL, they are more likely due to worker-level inefficiency (high wage relative to productivity) rather than a firm-level productivity or demand shock.

Figure 3: Layoff size and temporary layoffs (Fact 3-4)

(a) Firm: single layoff vs. mass layoffs



(b) Industry-Region: booms vs. busts



Note: Panel (a) shows the binned scatter plot of the TL share by firm-level layoff size. Figure 7 shows a similar relationship where we also control for worker characteristics. Panel (b) is also a binned scatter plot where the x-axis marks the log number of monthly layoffs in a 1-digit industry of one of the nine regions of Austria over the ten-year period of 2004-2013 (excluding December 2013 for missing data problems). The unit of analysis here is region-industry, while the Appendix Figure 9 shows similar results at the regional level. Both panels control for seasonality: region interacted with industry, and calendar month interacted with region, and with industry. Panel a, in addition, also includes controls for firm size and business cycles (layoff time (quarterly) interacted with industry).

2.4 Fact 4: Recessions are accompanied by higher recall shares

TL as well as unconditional and conditional recall rates are counter-cyclical. Here booms and busts are measured as the number of separations at the industry-region level.

Figure 3 panel b plots the TL share against the log number of monthly layoffs over the ten-year period of 2004-2013. It shows that TL shares are counter-cyclical, which echos the finding of Fujita and Moscarini [2017]. Moreover, the Appendix Figure 9 shows that recall rates of PLs are also counter-cyclical, and have a similar magnitude of variation as recalls of TLs. If TL is a signal to the employee to wait for a recall, the signal-to-noise value of TL is higher in downturns, exactly when waiting is less costly.

An interpretation of counter-cyclical TL is that during downturns, the reason for layoffs is more firm-related (a drop in demand or productivity) rather than worker-specific (low quality of worker or the match), which implies higher TL prevalence during downturns.

Counter-cyclical conditional recall rates imply that employers do not adjust their forecast adequately to economic cycles, if we assume that TL partially reveals the employer's forecast of the future of the business and the likelihood of recall. Employers are underestimating mean reversion, so that they are relatively pessimistic in downturns, and relatively optimistic in expansionary times.

2.5 Fact 5: Recalls occur around the communicated recall date. For TLs, the later the recall date, the lower the expected new-job wage

Most recalls happen around the date that the employer already communicated at the time of layoff, which varies from one to four months from the layoff date (Appendix Figure 10). The next fact investigates the change in behavior of TLs before and after the recall date.

Starting from the aggregate statistics that we reported in Section 2.1 (Appendix Figure 2), 6p.p. of the 24% TL who find a new job find it before the recall date. Inspired by Katz and Meyer [1990b], we start by analyzing non-recalled TLs who have not found a new job before the recall date.[9]While one-fourth of them start a new job within a week and another one-forth within the next six months, around **one-half** *never* find any job (Appendix Figure 10).[10]

The fact that one-half of not-recalled TLs never find a job may appear high, even more so since recalls happen early during the unemployment spell. This is due to the high rate of recall among TL, 58% (Appendix Figure 2). Including both recall and new job exits, three-fourth of TLs find a job within 20 weeks of layoff, while 60% of the remaining unemployed TLs

[9]Katz and Meyer [1990b] find that this group suffers thelongest unemployment spells and largest wage losses, using data on Missouri and Pennsylvania unemployment benefits recipients during the period of 1979-81.

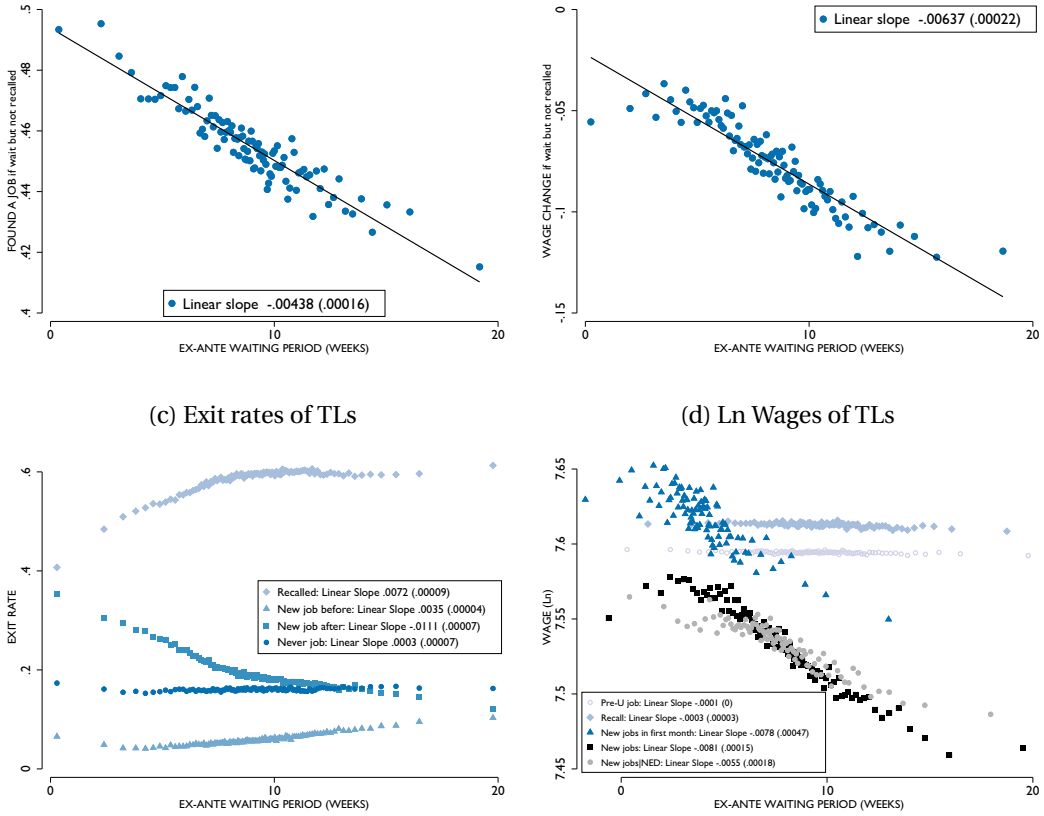
[10]The share of the last group is quite stable across separations at the beginning and close to the end of our sample, which gives us confidence that our data is long enough to make this claim.

never find any job.[11] Comparing these statistics to those for PLs, around 50% of PLs find a job within 20 weeks, and around 30% of the remaining never find a job. Given the differential in unemployment exit rates during the first 20 weeks of the spell between TLs and PLs, the likelihood of never finding a job *at layoff* is actually the same for PLs and TLs, around 15%, i.e. $\frac{1}{4} \times .6 = \frac{1}{2} \times .3$.[12] TLs, relative to PLs, are sorted faster: The recall decisions happening early during the unemployment spell sort TLs aggressively so that the share of lower-quality workers among TLs is higher than among PLs at a given unemployment duration.

Figure 4: TLs' outcomes by length of waiting period between layoff and expected recall date (Fact 5)

(a) New-job hazard | wait & no recall

(b) Wage change of new jobs found after recall date



(c) Exit rates of TLs

(d) Ln Wages of TLs

Note: The recall date is the date that the employer communicated at the time of layoff as the anticipated date of recall. The x-axis marks how far this date is from the layoff date. The y-axis marks: Panel (a) the share of non-recalled TLswho find a job after the expected recall date; Panel (b) the wage change, in log difference, for those who find a new job; Panel (c) exit rates by type and timing; Panel (d) Ln of wages, including the pre-layoff wage, recall wage, and new-job wage unconditional and conditional Residuals are from a regression with firm fixed effects, and flexibly controlling for wage, tenure, region, firm size, time(quarter) interacted with industry; as well as age, education, gender, marital status, blue-collar indicator, including all interaction terms. Results are very similar if instead of firm fixed effects 3-digit industry fixed effects are used.

For those who waited but were not recalled, a longer waiting period – i.e. a later recall

[11] The 60% share who never find a job at the end of 200 weeks of non-employment is higher than the 50% share reported in Appendix Figure 10, since the latter is at recall date which is almost always during the first 20 weeks.

[12] The difference between 15% who never find a job, and the share who have not found a job after a year, 18% and 31 % for TL and PL (Appendix Figure 2), appears also for the same reason. That is 3% of TLs find a job after the first year, vs. 16% of PLs.

date – is accompanied with a lower likelihood of finding a new job and lower wages if one is found (Figure 4, Panel a and b). However, the likelihood of never finding a job *at layoff* does not vary with the length of the waiting period since longer waiting comes with a higher likelihood of finding a job before the recall date *and* a higher recall rate. A similar pattern is documented in Appendix Figure 13 for age and wage: the likelihood of never finding a job after the recall date is actually lower for workers whose chance of recall is higher, which means that when considering the total chance of finding a job, there is relatively little variation across groups.

To illustrate this better, for a given group of TL, e.g. TL of age 50, we can write:

$$\mu \equiv P\left(\text{never find a job} \mid \text{waited but not recalled}\right) = \frac{P\left(\text{never}\right)}{1 - P\left(\text{recall}\right) - P\left(\text{before}\right)}$$

where $P\left(\text{before}\right), P\left(\text{recall}\right), P\left(\text{never}\right)$ are the probabilities of finding a new job before the recall date, getting recalled, or never find a job. Our first observation was that μ in the population is equal to a half. The second observation is that although μ varies substantially across groups, $P\left(\text{never}\right)$ does not vary much across groups – by age, wage or waiting period length. So most of the variation in μ is coming from the denominator, namely $P\left(\text{recall}\right) + P\left(\text{before}\right)$. One possible interpretation is that a constant share of TLs are employable, $1 - P\left(\text{never}\right)$, and they will get employed either before or after the anticipated recall date.

Two pieces of evidence suggest that the worker is taking the likelihood of recall and how late it will occur into account. First, if workers were not taking into account the likelihood of recall, then one would expect to see a negative association between the recall rate and the likelihood of never finding a job, i.e. $P\left(\text{recall}\right)$ and $P\left(\text{never}\right)$. This is not what we find across age, wage or wait period length (Appendix Figure 13 and Figure 4 panel c).

Second, the fact that a longer waiting period is associated with a larger wage loss , depicted in Figure 4 Panel b, does not stem from duration dependence, but rather a lower target wage conditional on non-employment duration.[13] Figure 4 panel d shows that the expected new-job wage is lower the later the recall date, and most of this negative relationship is unchanged once we use new-job wage conditional on non-employment duration. This suggests that the lower wage associated with a longer waiting period is mainly due to TLs lowering their target wage in each period in order to find a job faster when facing a long waiting period. Additional supportive evidence is that the later the recall date, the lower the new-job wage found in the first month after layoff (Figure 4 panel d).

In sum, the longer the waiting period, the longer the non-employment period, while the likelihood of finding a job within a year of layoff is unchanged. Moreover, the longer the waiting period, the lower the new-job wage, in part due to duration dependence but mainly

[13] Duration dependence is either due to deterioration of idle human capital or employers inferring the type using the unemployment duration, for evidence see Kroft et al. [2013] and for further discussions of its sources see Nekoei and Weber [2017].

due to lower target wage conditional on non-employment.

2.6 Fact 6: TL workers update their beliefs about the likelihood of recall

The sixth fact documents that for TL, the hazard of exiting unemployment rises and accepted wages drop right after a decline in recall likelihood. We use two designs to establish this fact. One uses the firm-reported anticipated date of recall, the other uses the date when former colleagues who were laid off with the individual are recalled.

The former relies on the observation that once a worker has not been recalled by the ex ante communicated recall date, she is much less likely to be recalled (Appendix Figure 14). The second strategy is based on the fact that the likelihood of recall falls after the recall of worker's former colleagues (Figure 5). The advantage of the second approach is that it does not rely on data on the communicated recall dates, which allows us to use the data for the full sample, 1980-2013 instead of 2004-2013. This approach is thus replicable in other administrative datasets, where such information on the communicated recall date is not available.

Figure 5 shows the results of the second strategy. It documents a shift in the new-job hazard and a drop in the accepted wage exactly when the colleagues are recalled. The results of the first strategy using the communicated recall dates are similar (Appendix Figure 14).

Another version of the second approach is to focus on recall of former colleagues only if they were laid-off together. This is a subset of recalls investigated in Figure 5. The recall of a group of a layoff cohort sometimes occurs in a single day, and sometimes during a longer period. If this happens in a single day, this is the focus of the Appendix Figure 15. Appendix Figure 16 complements this by looking at the cases where recalls are not clustered in one day, but occur during several days. All results support the findings above, and moreover suggest that the last recall day is a more important signal than the first recall day.

In a perfect experiment with forward-looking agents and perfect information, if the recall likelihood falls at a certain point during the unemployment spell, we expect workers to update their belief about the recall likelihood and change their search behaviors, leading to a rise in the hazard of unemployment and a fall of target wage (Katz [1985]). However, in the empirical setting, there are two additional mechanisms at play. The first is selection, which is interesting in light of discussion of Fact 5: at the critical date when some workers are recalled, the labor pool changes as a result. This mechanism is unlikely to be important here since it can justify both the hazard rate and wage patterns if the recalled TLs have higher target wages but lower hazard rates at the same time. The second mechanism is the possibility that other employers infer worker quality from the information that a worker was not recalled. This is similar in spirit but different from learning from the layoff itself (Gibbons and Katz [1991]). This is also unlikely since it can be at play if other employers know about the communicated recall date or observe colleagues' recall.

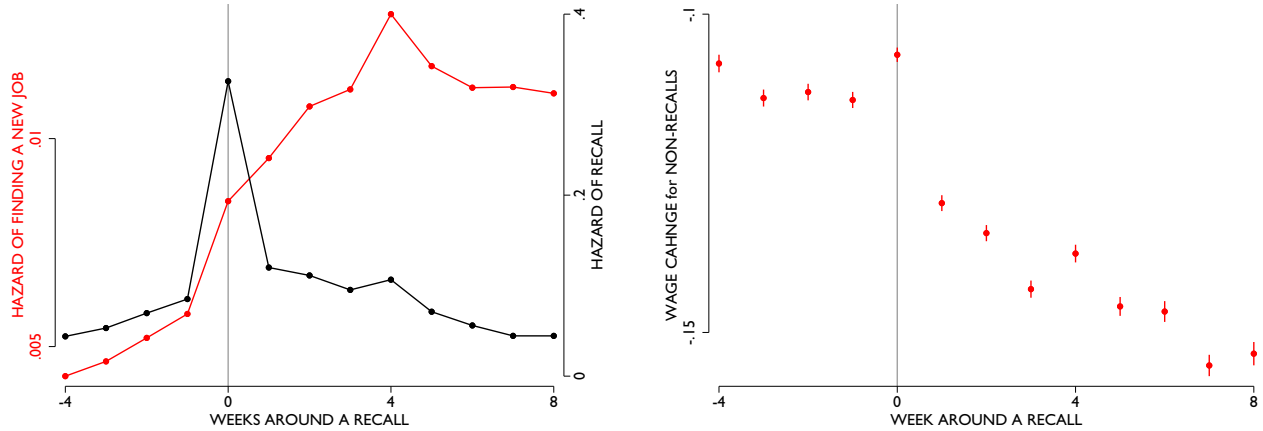
All in all, both evidences, either the increase in the hazard of finding a new job or the drop

in the wage of those jobs, suggest that TLs are updating their beliefs about the recall likelihood downwards as a response to the recall of former colleagues and to not being recalled on the recall date.

Figure 5: Search outcomes around a recall of a former colleague (Fact 6)

(a) Hazard rate

(b) Wage of new job



Note: We investigate the search outcomes around the reference date, which is defined as the day when some of pre-unemployment colleagues are recalled. The sample is balanced in the pre-event period, i.e. only focusing on cases where the recall of former colleagues occurs more than 4 weeks after the own separation. Panel b shows the log wage change between the pre-unemployment and post-unemployment jobs *only* for workers who find a new job (not recalled). Any day when at least one former colleague of a laid-off worker (sample of 19 million layoffs during 1980-2013) is recalled represents one observation, leading to a total of 55 millions observations.

2.7 Fact 7: Unemployment benefit extension increases separations in recall-intense sectors

The seventh fact provides evidence supporting a classical hypothesis in Public Economics: an imperfect experience rating unemployment insurance (UI) system leads to inefficient temporary layoffs in some sectors at the expense of others (Feldstein [1978]). We have relatively little empirical evidence supporting this argument. For example, Card and Levine [1994] provide a negative correlation between the degree of experience-rating and the TL share of unemployment across U.S. states.[14] Fact seven establishes a causal link from the length of benefit duration into the recall rate.

We exploit a discontinuity in UI eligibility in Austria, whereby the unemployment benefit eligibility increases from 20 to 39 weeks at the age of 40. The focus is on workers with less than three years of experience during the last five years but with more than 6 years over the last 10 years. For this particular group, the unemployment duration jumps from 20 to 39 weeks for workers aged below and above 40.[15]

[14] See Nekoei [2014] for a more complete discussion of the prior empirical findings.

[15] See Nekoei and Weber [2017] for detailed information about the unemployment benefit rules in Austria.

We argue that this discontinuity, which has not been studied before, is suited for our investigation. The discontinuity is rather large relative to prior studies (Card et al. [2007], Nekoei and Weber [2017]) *and* it covers the period when recall is still relevant (Schmieder et al. [2012], Schmieder et al. [2016]).

We find that the extension increases recalls partially by increasing the likelihood of separation in TL-intense sectors (Appendix Figure 18). More precisely, the average recall rates are 2.4 p.p. higher for workers eligible for the additional 19 weeks of UI. If instead of the individual worker recall, we focus on the average TL or recall rate in their sector, we find a statistically significant, albeit smaller, one p.p. effect of the UI extension on the sector-level average recall or TL rate. Furthermore, the higher recall rate due to UI extension is concentrated among TL, as well as among those who were recalled after 39 weeks.

This suggests that sectors which use TL more extensively are more likely to layoff those workers who are eligible for a longer UI duration. Conditional on layoff, recall rates are higher, the longer UI eligibility.

2.8 No detected relationship between TL and match quality

As discussed in Section 2.2, one reason for TL can be cases where the employer-employee relation has a high match value – the productivity of either party is lower in any other match. However, we were unable to find any evidence supporting the hypothesis that TLs should be more prevalent for higher quality matches. Following previous work, wage or the duration of a job are used as proxies for match quality. We find no significant and systematic differences in the TL likelihood for the same individual between two jobs with either different wages or tenure. If wage or tenure are reasonable proxies for match quality, then this exercise suggests that the match quality is not correlated with the TL likelihood.

Appendix Figure 19 Panel a compares the relationship between these proxies of job quality and TL for two consecutive jobs of the same individual. In the same vein, panel b compares jobs using the following specification:

$$TL_{iJ(i,t)} = \beta_0 w_{iJ(i,t)} + \beta_1 T_{iJ(i,t)} + \delta_i + \delta_{J(i,t)} + \delta_t + \varepsilon_{iJ(i,t)} \tag{2}$$

where i indicates individual, $J(i,t)$ the firm in which i is working at time t, so that $TL_{iJ(i,t)}$ is the indicator of TL, $w_{iJ(i,t)}$ denotes her log daily wage, and $T_{iJ(i,t)}$ denotes the tenure. The controls are the same as in the equation (1). The results suggest economically small associations between TL and our proxies of match quality, the sign of which is often the opposite to what we would expect. That is, jobs with a higher tenure and a higher wage are less likely to end up in TL. This could simply represent the fact that a higher tenure and a higher wage are a sign of a high bargaining power.

3 Conclusion

Our results suggest that when faced with a *perceived temporary* shock, firms use TL to prevent the loss of workers who are difficult to replace at the same wage. If the number of layoffs at a firm or in an industry indicates the magnitude of the shock currently faced, the TL share of those layoffs indicates employers' perception about the future of their businesses.Employment Offices usually record whether a layoff is temporary, so the TL share is observable information to policy makers. We believe that this information can play a crucial role in depicting business perceptions almost in real time.

Workers who are on TL update their beliefs about the recall likelihood, and their search outcomes reflect their beliefs. Most of them search little and do not find a job before the expected recall date. This wait can be costly if not recalled, and workers take this partially into account. An important question for future research is to what extent additional information sharing between former employers and TLs after layoff about recall likelihood could reduce the wasteful part of TLs' waiting to be recalled.

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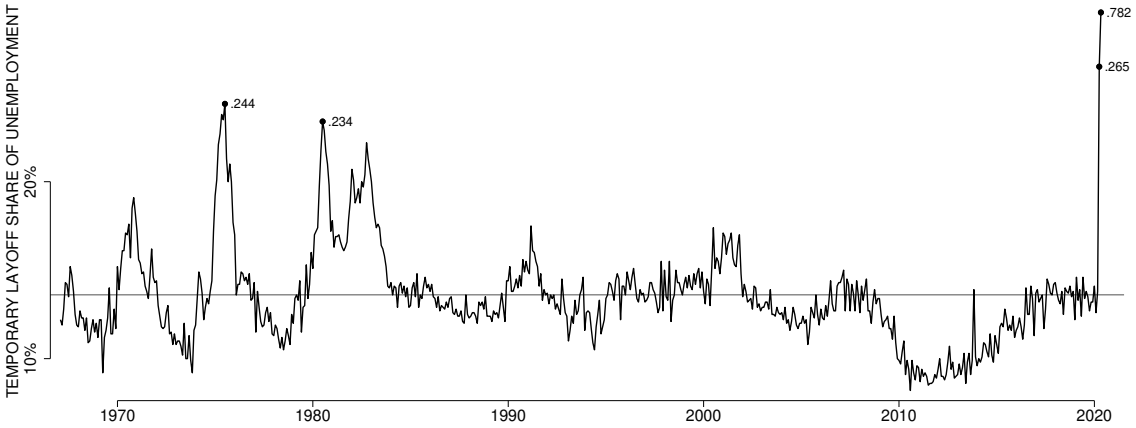
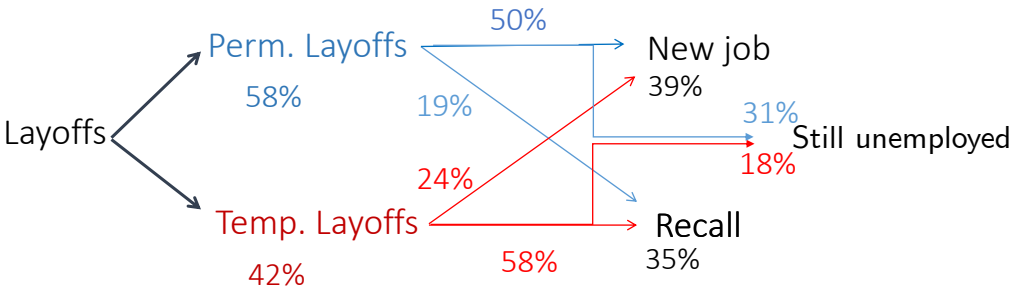
Online Appendix

Figure 1: The absence of a trend in the share of temporary layoffs among the unemployed



Note: Monthly shares from January 1967 to April 2020 in the U.S.. The share is labeled for some historically high levels: June 1975, June 1980, March and April 2020. The last month's share is attenuated to make the rest of the data visible. The horizontal line shows the average TL share of unemployment during the entire period. Note that the definition of TL differs here from the Austrian context, the focus of the rest of the paper. Here TL is defined as an unemployed worker who expects to be recalled by the pre-unemployment employer within six months at the time of survey. Seasonally adjusted. Source: Current Population Survey (CPS)

Figure 2: From temporary layoff to recall

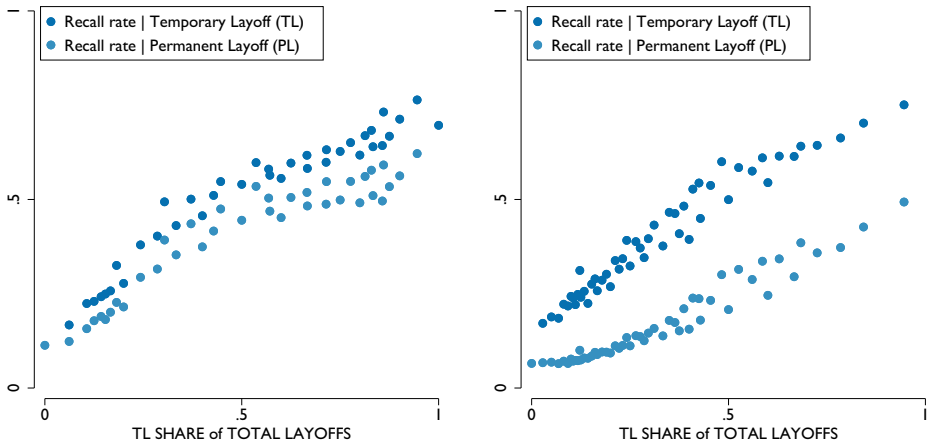


Note: Number observations: 3,882,584. All exit rates are measured within the first year after layoff. For example, 58% of TL are recalled and 18% are still unemployed after a year from layoff. Section 2.5 will discuss that 6 p.p. of 24% of TLs who find a new job, find it before the recall date.

Figure 3: TL shares and recall rate: Patterns in raw data (Fact 1)

(a) Firm level

(b) Industry level



Note: This figure investigates the relationship between the likelihood of recall and the average TL share at the firm or industry level. The likelihood of recall conditional on TL and PL is illustrated against the TL share of layoffs of a given firm or industry in a given calendar month. The focus is on cases where at least five workers were laid off during the month to reduce noise on the x-axis. If the signal value of TL were independent of the TL share at the firm and industry level, we would expect a horizontal line in both graphs.

Table 1: TL shares and recall rate (Fact 1)

(a) Firm-level

	(1) Recall | TL	(2) A job | TL	(3) Recall | PL	(4) A job | PL
TL Share	0.25***	0.03***	0.18***	0.11***
	(0.003)	(0.002)	(0.002)	(0.003)
Constant	0.27***	0.74***	0.14***	0.53***
	(0.002)	(0.002)	(0.000)	(0.000)
Num. Obs	668572	668572	1275594	1275594
R2	.27	.23	.22	.091

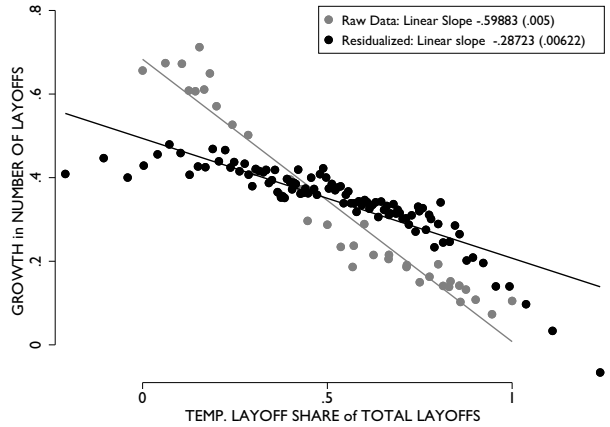
(b) Industry-level

	(1) Recall | TL	(2) A job | TL	(3) Recall | PL	(4) A job | PL
TL Share	0.16***	0.05***	0.04***	0.01
	(0.014)	(0.013)	(0.006)	(0.010)
Constant	0.33***	0.78***	0.10***	0.50***
	(0.005)	(0.004)	(0.001)	(0.002)
Num. Obs	28658	28658	40804	40804
R2	.61	.44	.6	.39

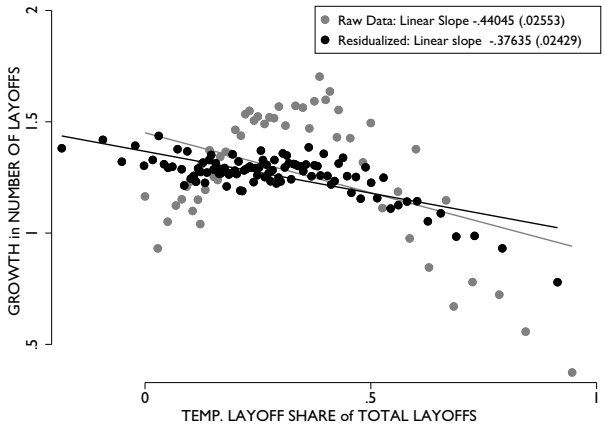
Note: Results of regressions of job-finding conditional on layoff type, temporary or permanent layoff (TL or PL) on TL share of laid-off workers at firm or 3-digit industry level, Panel a and b, respectively. The unit of time is months, e.g. TL Share of at firm level corresponds to the share of laid-off workers within a calendar month from a firm. "A job" means getting recalled or finding a new job within six months of layoff. The sample includes cases where at least five workers were laid off during the month to reduce noise.All regressions control flexibly for layoff size, the interactions of industry, region, and calendar month. Robust standard errors reported. * p < 0.1, ** p < 0.05, *** p < 0.01.

Figure 4: Current TL shares and future separations (Fact 1)

(a) Firm level



(b) Industry level



Note: This figure plots the ratio of the number of separations into unemployment in the next six months relative to the current month against the current TL share, at the firm and 3-digit industry level, in panel a and b, respectively. The raw correlation, as well as the conditional correlation, are illustrated. The latter controls flexibly for layoff size, the interactions of industry, region, and calendar month. The sample includes cases with at least five layoffs in the current period.

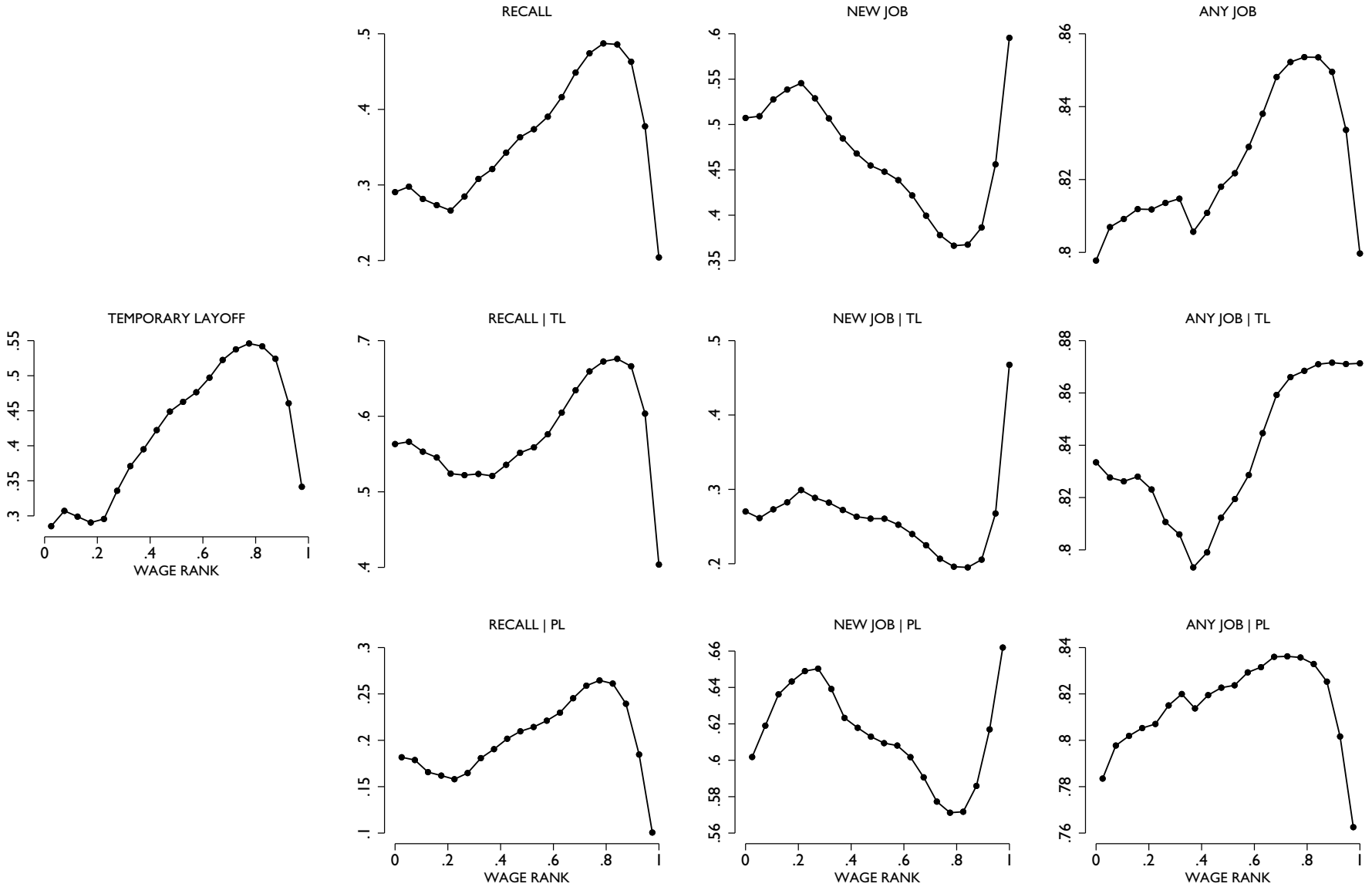
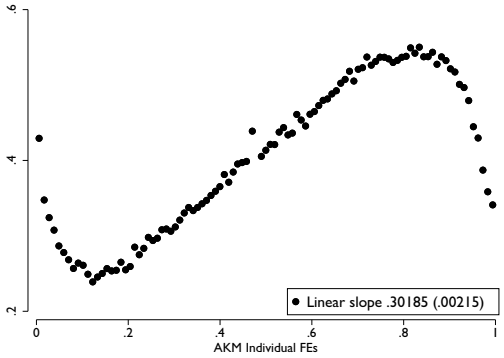


Figure 5: **Temporary layoff and recalls across wage (Fact 2).**

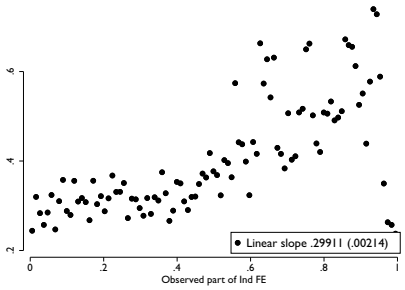
Note: The x-axis shows the within-birth-cohort rank of an individual's daily wage in the year before layoff. Rank is by the 5th percentile in the distribution of all layoffs, e.g the top group marks the workers with a daily wage in the top 5 percent of all layoffs of their birth cohort. The y-axis marks different types of exit rates, censored at one year, e.g. "RECALL | TL" is the share of TL returning to the former employer (recalled) within a year from the layoff.

Figure 6: TL pattern by employee type (Fact 2)

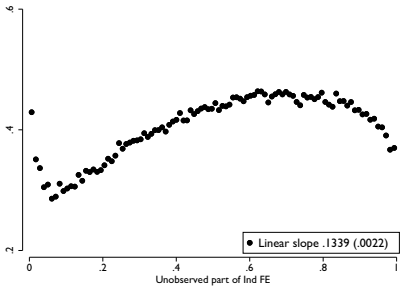
(a) AKM Individual Fixed Effects



(b) Observed part



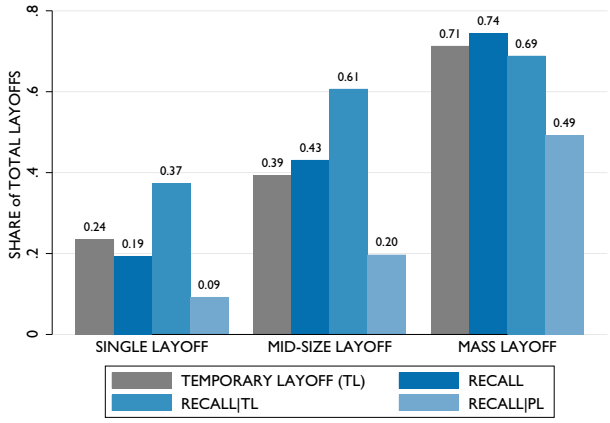
(c) Unobserved part



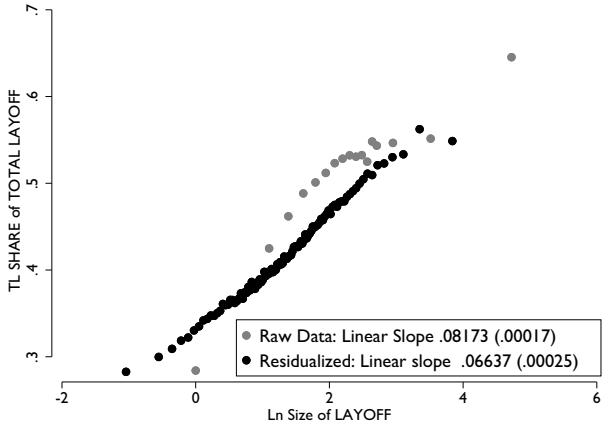
Note: This figure decomposes the pattern of TL and wages studied in figure 5 into the AKM firm and individual effects, and a remaining residual. Panel a plots the TL share with respect to AKM individual fixed effects. Panels b and c investigate the TL share by observed and unobserved parts of individual fixed effects. The observed part is the predicted side of the Mincer equation of individual fixed effects and covariates include: tenure, experience; as well as age, education, gender, marital status, blue-collar indicator, including all interaction terms. The focus is on firms with more than 10 separations during the sample period.

Figure 7: Layoff size and temporary layoffs (Fact 3)

(a) Raw correlation

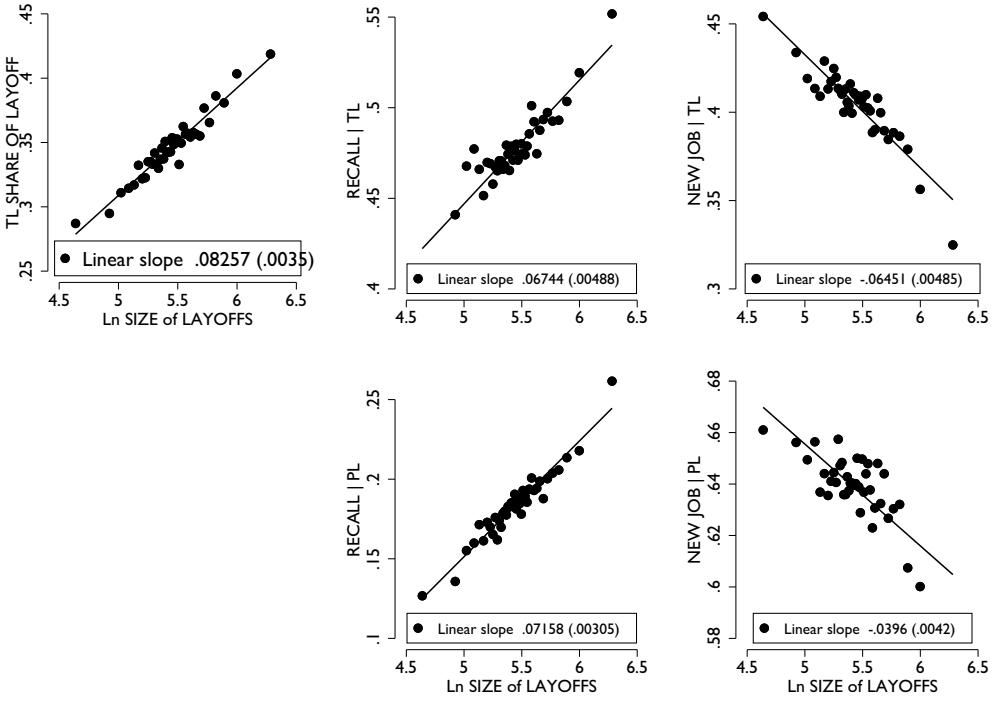


(b) Conditional correlation



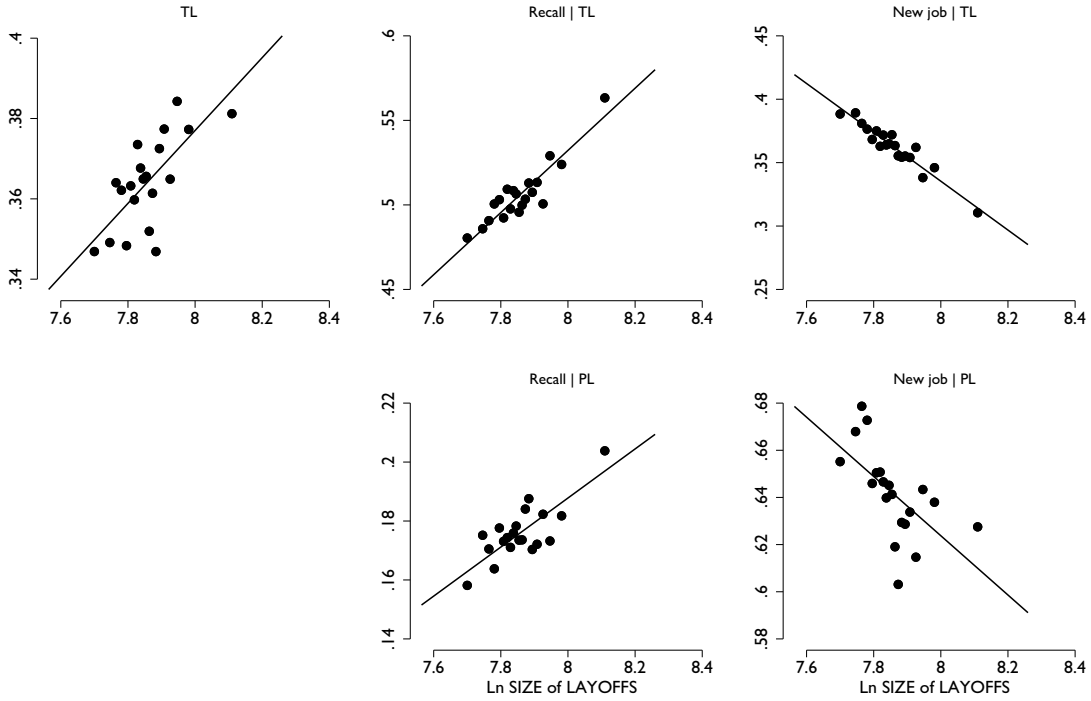
Note: Panel (a) focuses on 3-month layoffs occurring in firm size>3, so that we can meaningfully partition them into 54% mass layoffs (more than half of the workers are laid off), 28% single layoffs (only one worker is laid off within a calendar month), and 17% mid-size layoffs (the remainder). Panel (b) shows the TL share by layoff size with and without controls, where we control flexibly for firm size, wage, tenure, location, time(quarter) interacted with industry; as well as age, education, gender, marital status, blue-collar indicator, including all interaction terms.

Figure 8: TL and recall over the business cycle (Fact 4)



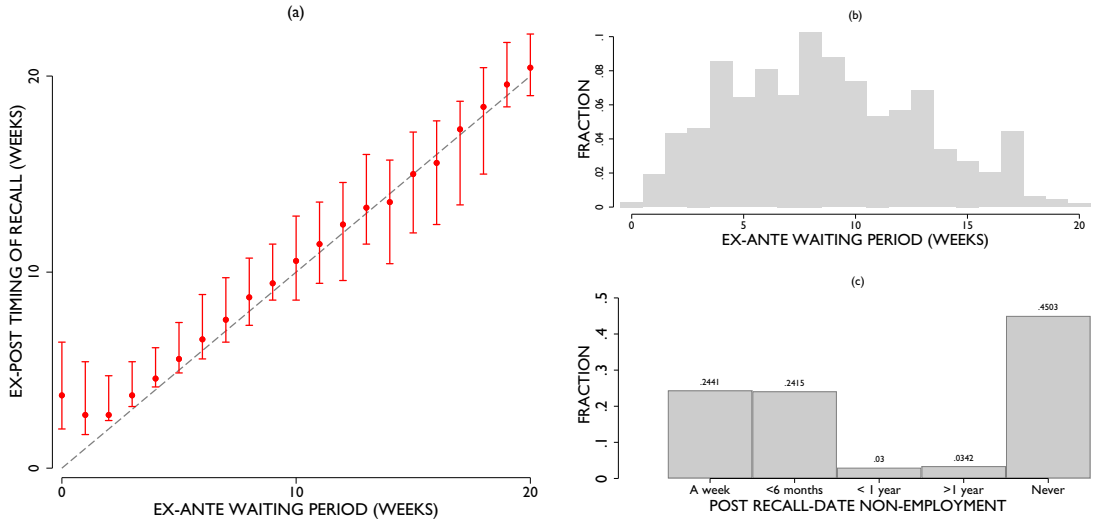
Note: TL stands for temporary layoff, and PL for permanent layoff, e.g. "Recall|TL" is the share of TL who return to their pre-unemployment employer. The x-axis marks the log number of monthly layoffs in a 1-digit industry of one of the nine regions of Austria over the ten-year period of 2004-2013 (excluding December 2013 for missing data problems). The controls are region-interacted with industry, and calendar month interacted with region, and with industry.The unit of analysis here is region-industry, while the Appendix Figure 9 shows similar result at regional level.

Figure 9: TL and recall over the business cycle: Regional variation (Fact 4)



Note: TL stands for temporary layoff, and PL for permanent layoff, e.g. "Recall|TL" is the share of TL who return to their pre-unemployment employer. The x-axis marks the log number of monthly layoffs in each of nine regions of Austria over the ten-year period of 2004-2013, excluding December 2013 for missing data problems. All variables are adjusted for seasonality.

Figure 10: Ex-ante communicated recall date and ex-post recall outcomes (Fact 5)



Note: The communicated recall date is the date that the employer communicated at the time of layoff as the anticipated date of recall. Panel (a) compares the ex-ante communicated recall date with ex-post outcomes, both with respect to recall or finding a new job. It plots non-employment duration against the duration of the waiting period, i.e. the number of weeks between separation date and the communicated recall date. The vertical bars show the 25 to 75 percentiles and the medians are indicated by circles. Panel (b) shows the histogram of the waiting periods (the mean is 65 days, P10, P50, and P90 are 26, 62, and 107 days, respectively). Panel (c) shows the histogram of the number of days it took a temporary layoff to find a new job for TL who did not find a new job before the recall date and has never been recalled. Data: 1,621,733 temporary layoffs in the period 2004-2013.

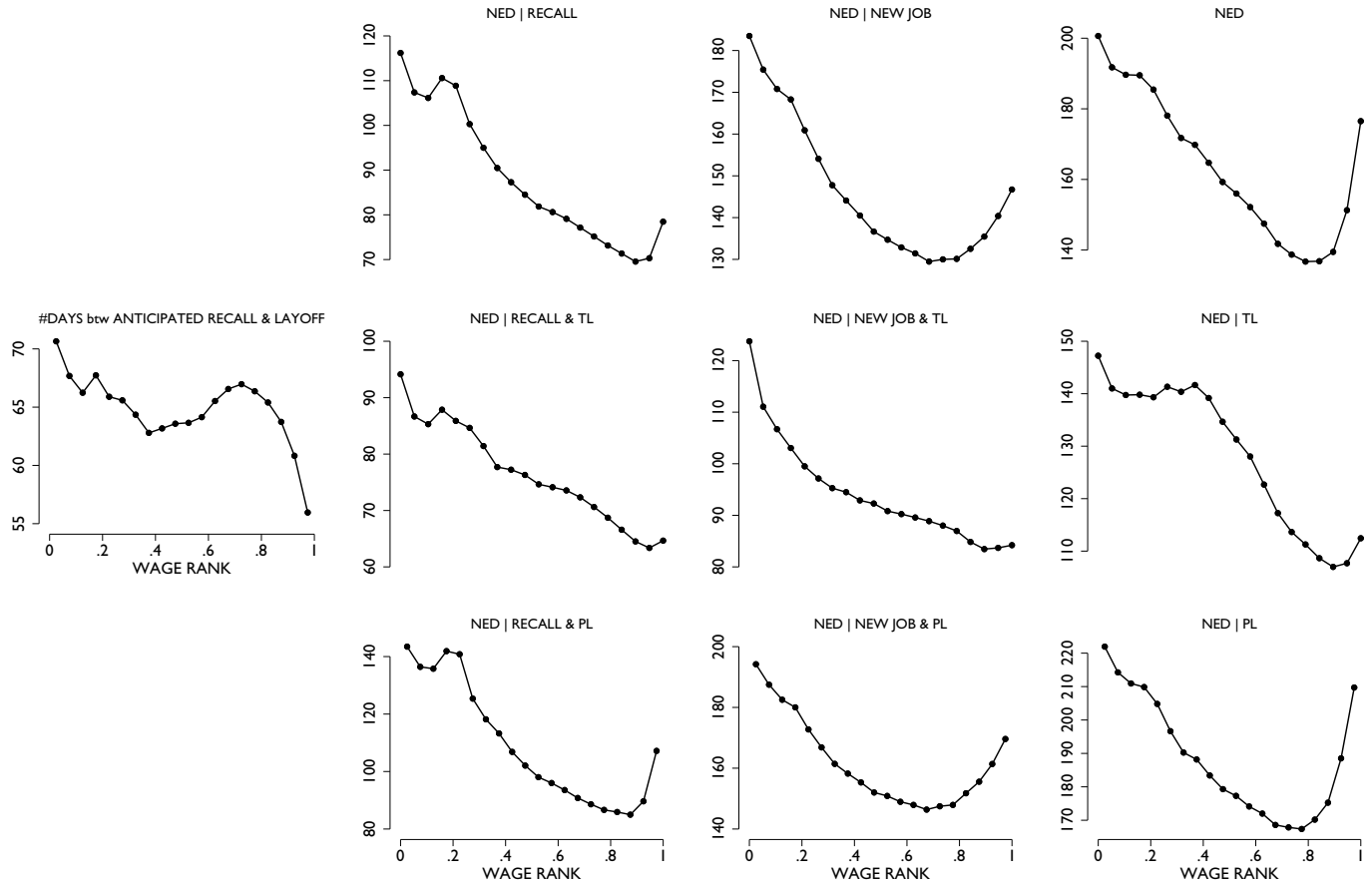
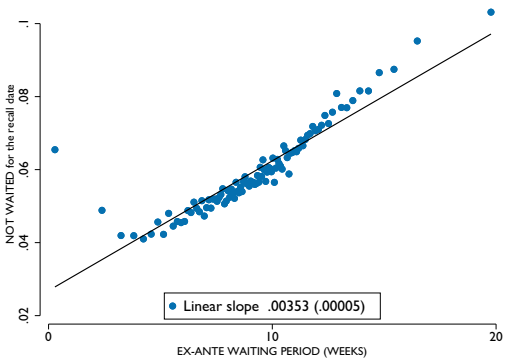


Figure 11: **Temporary layoff and recalls across wage (Fact 5).**

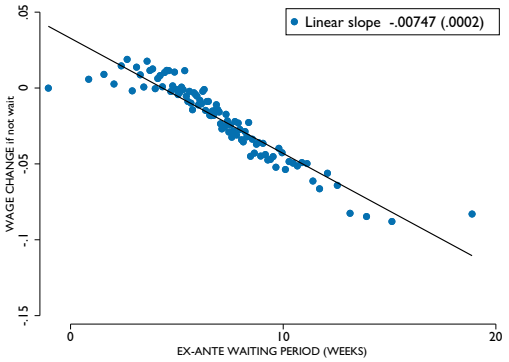
Note: The y-axis marks the non-employment duration (NED) by differnt types of exit rates, winsorized at one year, e.g. "NED | RECALL TL" is the average non-employment duration for TL who are [sth is missing here]. The x-axis shows the within-birth-cohort rank of an individual's daily wage in the year before the layoff. The rank is by 5th percentile [not sure what you mean here] in the distribution of all layoffs, e.g the top group marks the workers with a daily wage in the top 5 percent of all layoffs of their birth cohort.

Figure 12: Longer waiting is associated with lower job-finding prospect if not recalled (Fact 5)

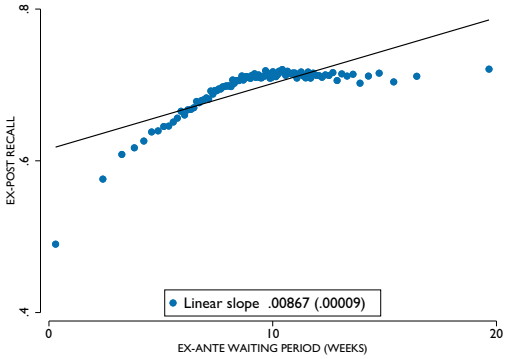
(a) Not wait: Find a new job before recall date



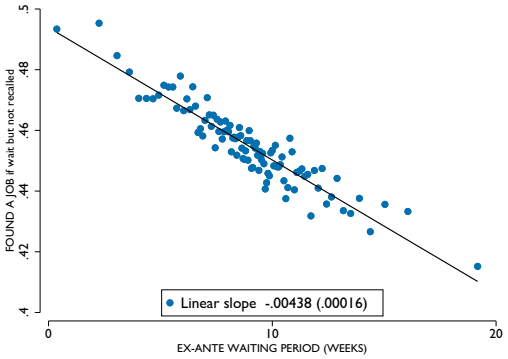
(b) Wage change if not wait



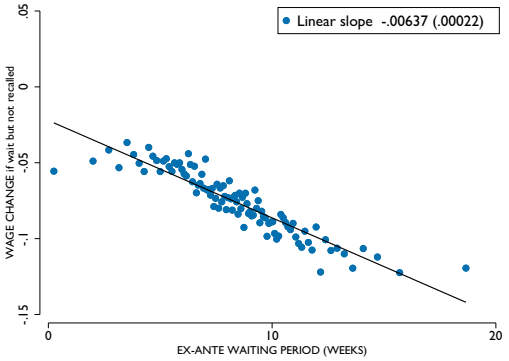
(c) Recall likelihood



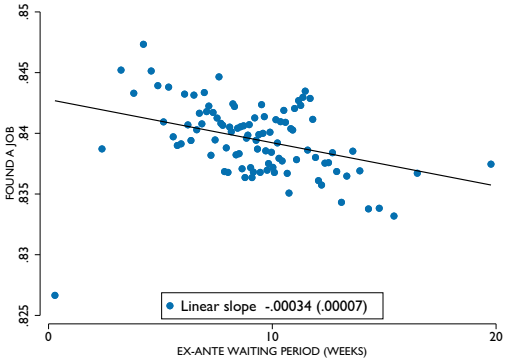
(d) Never find a job if wait but no recall



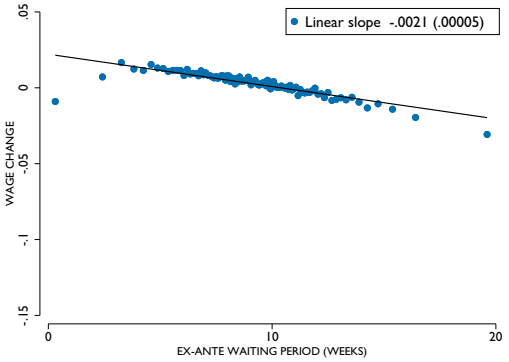
(e) Wage change if find a new job after recall data



(f) Find a job



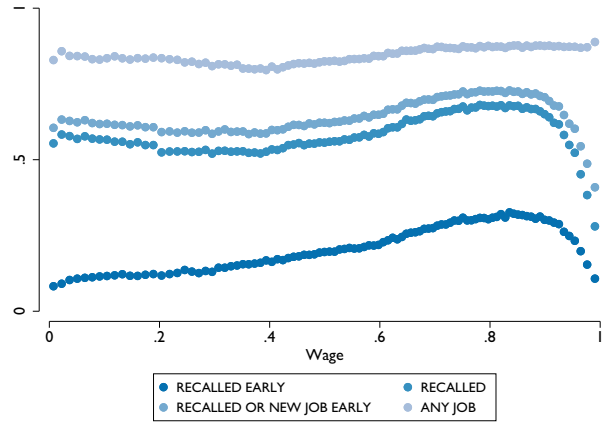
(g) Wage change



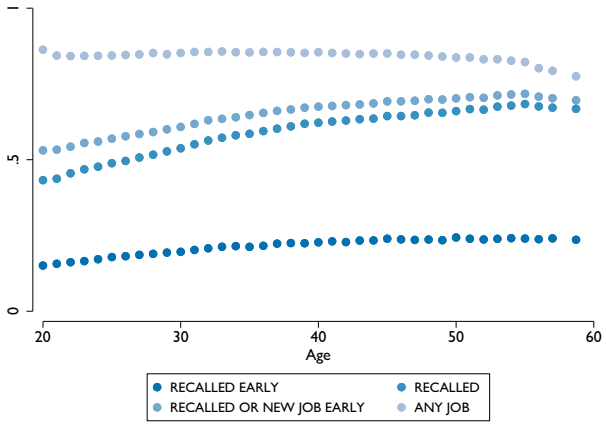
Note: The communicated recall date is the date that the employer communicated at the time of layoff as the anticipated date of recall. Panel (a) shows the share of TL who find a new job before the recall date, and Panel (b) shows their wage change, in log difference. Panel (c) shows the share of TL who are recalled. The two remaining panels focus on the TLs who are not recalled and did not find a new job before the recall date. Panel (d) shows the share of them who never find a job, and Panel (e) shows the wage change, in log difference, for those who find a job. Panel (f) and (g) shows the total hazard of finding job and wage change, unconditional of exit type or timing

Figure 13: Share of TL who are recalled or find a new job by wage and age (Fact 5)

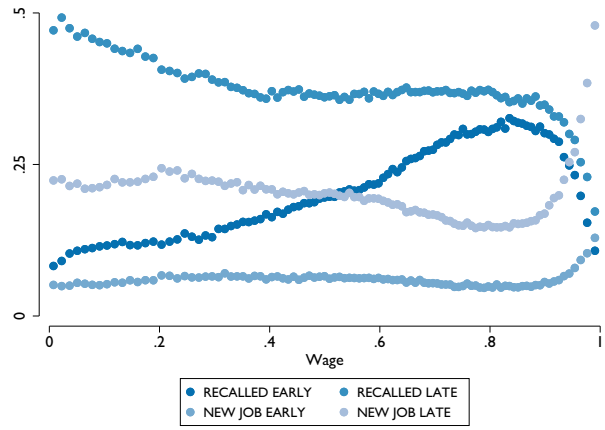
(a) By wage: Cumulative



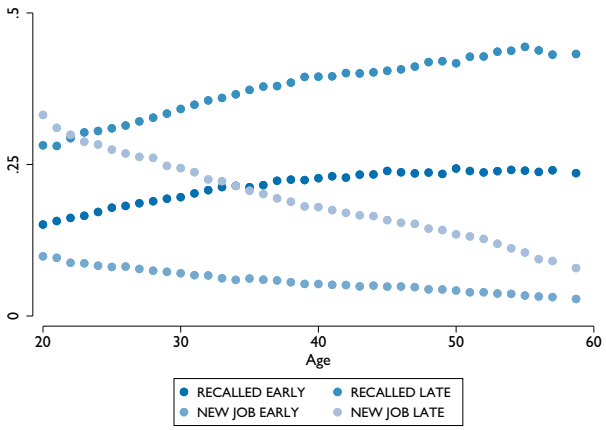
(b) By age: Cumulative



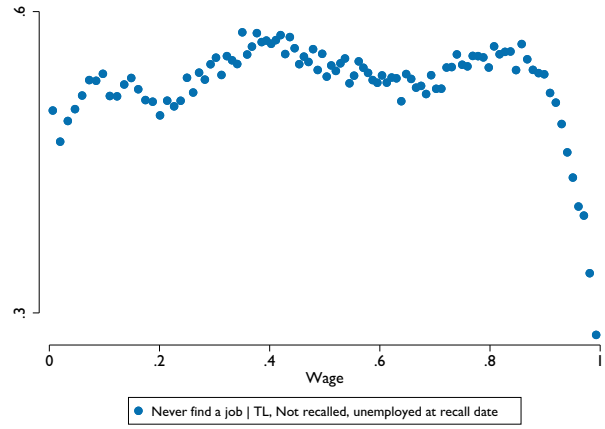
(c) By wage



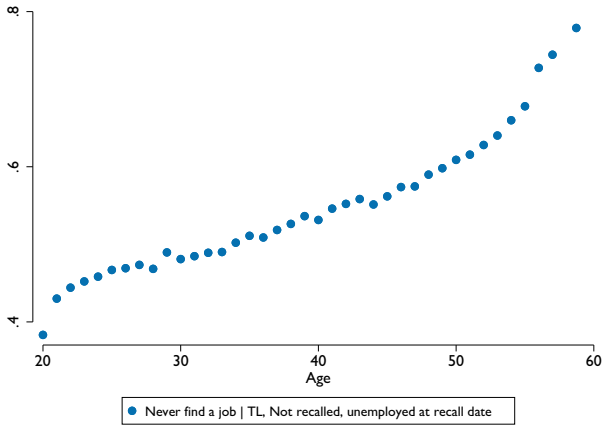
(d) By age



(e) By wage: Likelihood of not finding any job conditional on still being unemployed at the recall date



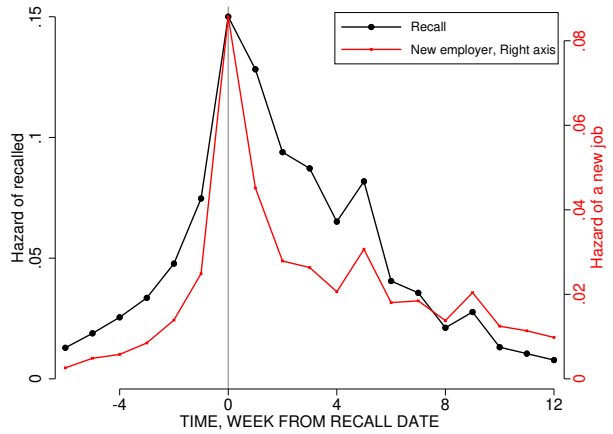
(f) By age: Likelihood of not finding any job conditional on still being unemployed at the recall date



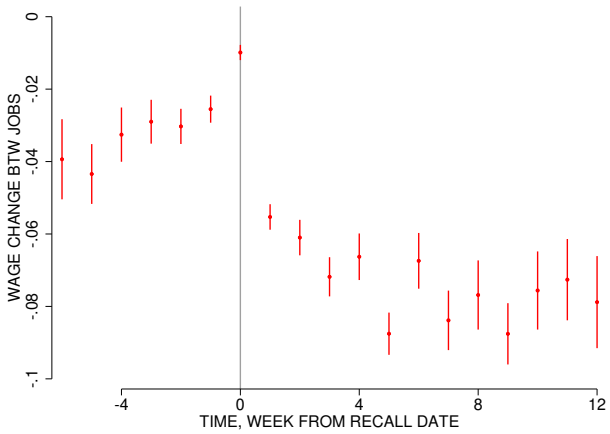
Note: Early and late are relative to the recall date, the date communicated at the time of the layoff by the pre-unemployment employer as the potential recall date. The sample is TL population.

Figure 14: Search outcomes around the communicated recall date (Fact 6)

(a) Hazard rate



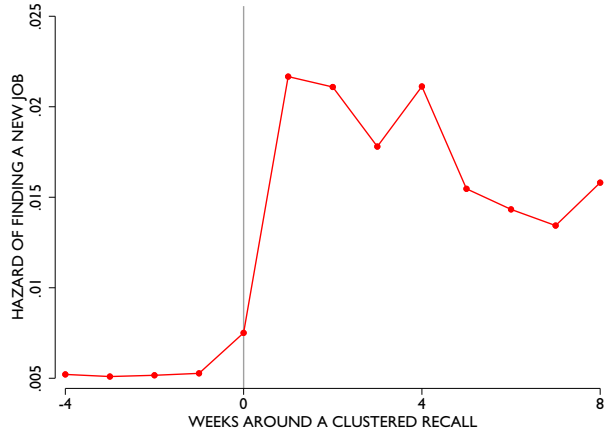
(b) Wage of new job



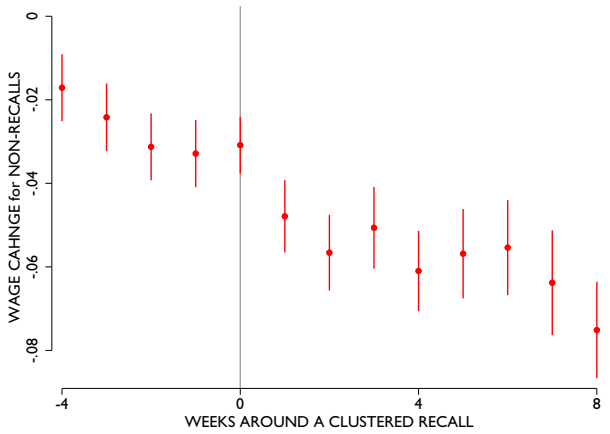
Note: Time relative to recall date (communicated date by the employer at the time of layoff) is on the x-axis, where 0 marks the recall date, and the weekly-bin is used otherwise. Panel a shows the hazard of reemployment, either recall, left axis, or new job, right axis. Panel b shows the log wage change between the pre-unemployment and post-unemployment jobs *only* for workers who find a new job.

Figure 15: Search outcomes after a recall day, clustered recall (Fact 6)

(a) Hazard rate



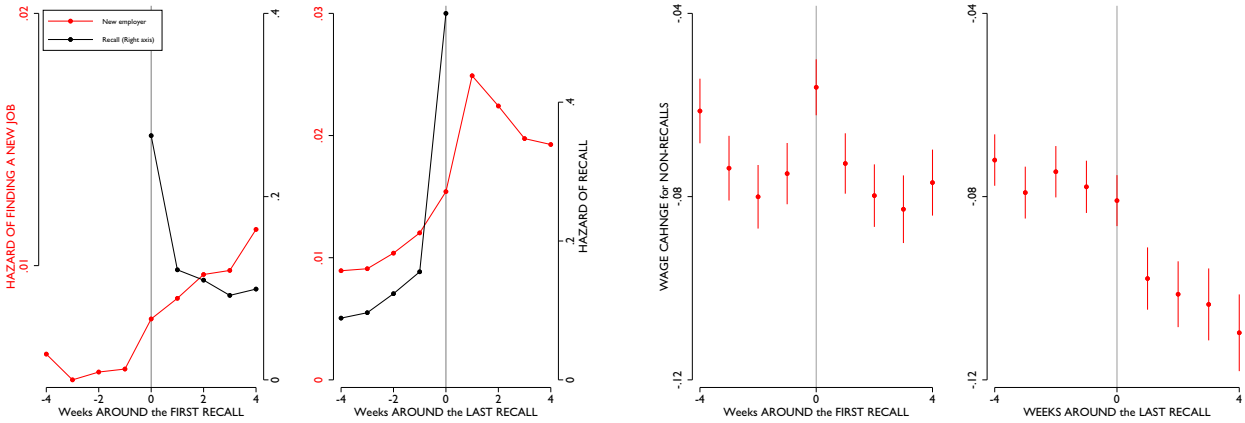
(b) Wage



Note: 2.96 millions observations used to investigate the search outcomes similar to those in Figure 14, but without using the communicated recall date. Instead, the reference is to the day when some of pre-unemployment colleagues who were laid-off together are recalled. The hazard rate of recall on that day is 42%. Figure 16 investigates the case when former colleagues are not all recalled in a single day. The sample is balanced in the pre-event period, i.e. only focusing on cases where the recall of former colleagues occurs more than 4 weeks away from the own separation. Panel c shows the log wage change between the pre-unemployment and post-unemployment jobs *only* for workers who find a new job.

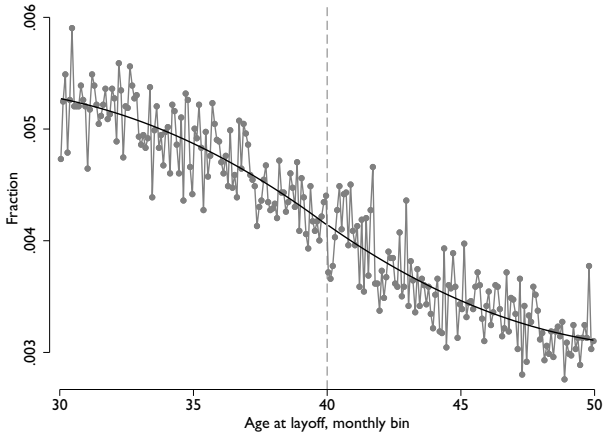
Figure 16: Search outcomes after the first and last recall (Fact 6)

(a) Hazard rate (b) Wage



Note: This figure considers cases where as opposed to the Figure 15, there is a recall period, i.e. the pre-unemployment firm is recalling colleagues who are laid off together notina single day but during a period. The left-hand panel then investigates the reaction to the first recall day (2.44 millions of obs), and the right-hand panel the reactionto the last recall day (3.59 millions of obs). Both samples are balanced, i.e. focusing only on cases where the first or last recall of former colleagues occurs more than 4 weeks away from own separation. This explains the difference in the sample size of the first vs last recall.

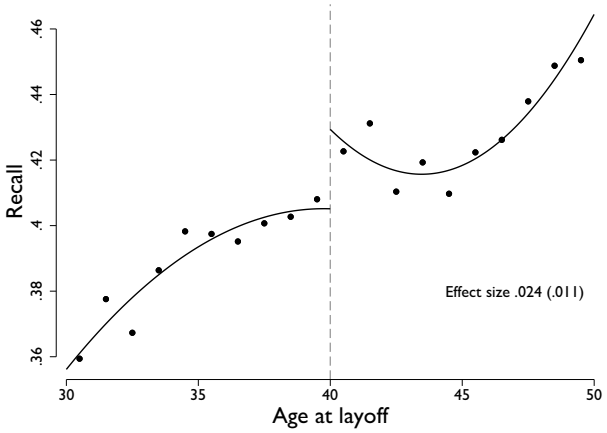
Figure 17: Mccrary Test (Fact 7)



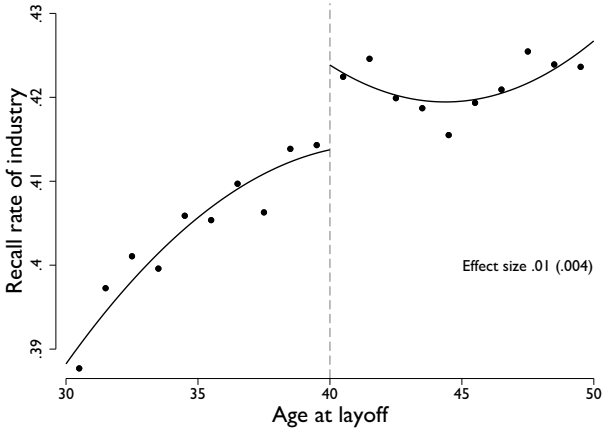
Note: Mccrary test, the distribution of age around the age-cutoff.

Figure 18: Effect of unemployment benefit (Fact 7)

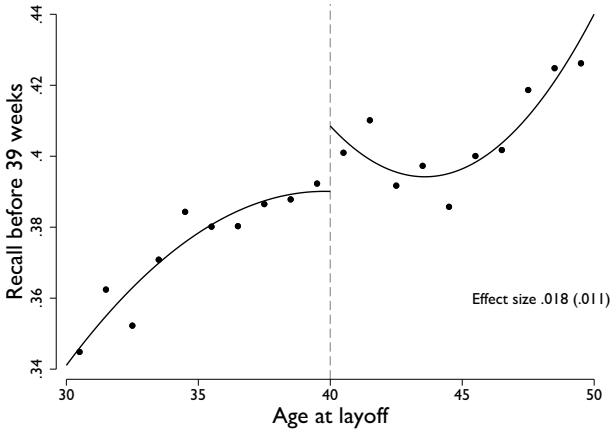
(a) Higher recall



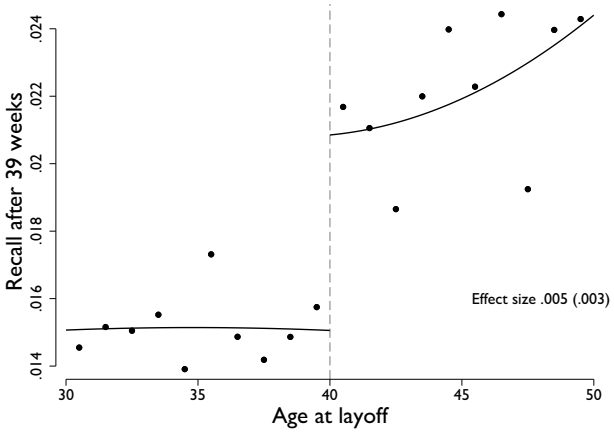
(b) Higher recall-intense sector



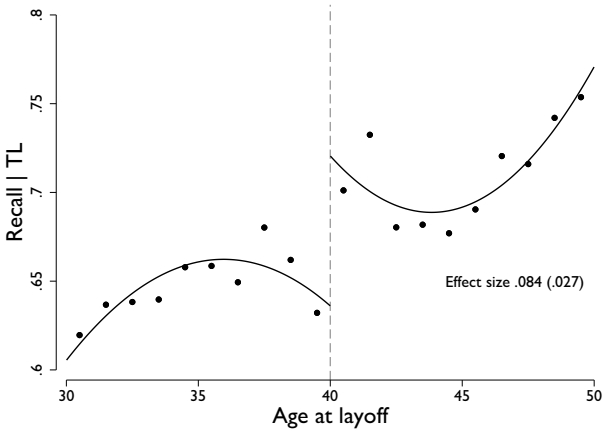
(c) Recall likelihood *before* 39 weeks



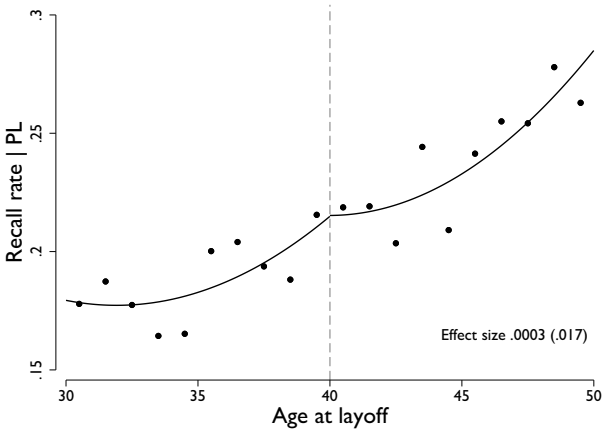
(d) Recall likelihood *after* 39 weeks



(e) Recall of TL



(f) Recall of PL

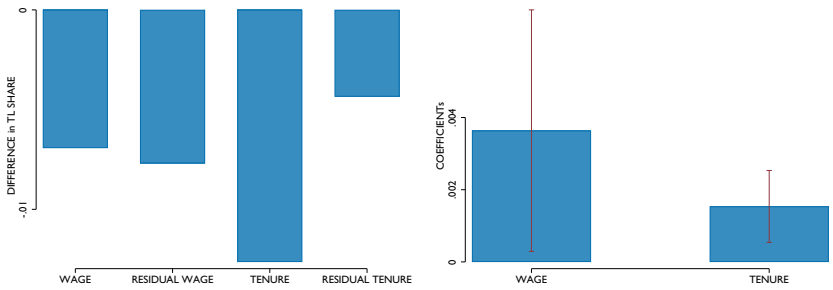


Note: Unemployment insurance (UI) eligibility is 20 weeks below and 39 weeks above the age-40 cutoff. Relative to the prior literature focusing on UI extensions early during the unemployment spell, this is a large extension, e.g. almost double the size of the extension studied in Nekoei and Weber [2017]. Panel (a) presents the recall rate: the share of workers going back to their pre-unemployment firm by age, and panel (b) plots the average recall rate of the pre-unemployment sector measured in the whole population. Panels (c) and (d) illustrate the recall rate in the first 39 weeks and after 39 weeks, respectively. Panels (e) and (f) show the recall rates for TL vs PL, separately. Panels e-f use only the data from 2004-2013 where TL status data is available.

Figure 19: TL share by proxies for match quality

(a) Two Consecutive Jobs

(b) AKM specification with TL as dependent var.



Note: Panel a asks whether a job that pays more or lasts longer has a higher chance of leading to TL, rather than PL. It shows the difference between TL likelihoods of two consecutive jobs of the same individual. Jobs are ranks according to wage, residual wage, tenure and residual tenure. The difference in the TL share plotted on the y-axis then shows, e.g., how much TL differs in a high wage job relative to the other one. Residuals are taking into account *firm fixed effects* as well as flexibly [should it be "flexibility"?] for time-varying observable individual characteristics, including age, martial status, experience, calendar year and month, occupation, and some of their interactions. **Panel b** also compare jobs within-individual but not necessarily consecutive. It is using equation 2, based on an AKM framework controlling for individual and firm fixed effects (Abowd et al. [1999]). TL is the dependent variable, and panel b shows the coefficient of log wage and tenure. It also controls for calendar year and age, similar to the recent trend in the AKM literature (Card et al. [2018]).