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UNEMPLOYED WITH JOBS AND WITHOUT JOBS

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Working Paper 27886  
<http://www.nber.org/papers/w27886>

NATIONAL BUREAU OF ECONOMIC RESEARCH

1050 Massachusetts Avenue  
Cambridge, MA 02138  
October 2020, Revised June 2021

Hall's research was supported by the Hoover Institution. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research, the Federal Reserve Bank of San Francisco or the Federal Reserve System. We thank Benjamin Schoefer for helpful discussions. Data and calculations are available at Kudlyak's website and cover the period through May 2021.

At least one co-author has disclosed additional relationships of potential relevance for this research. Further information is available online at <http://www.nber.org/papers/w27886.ack>

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Unemployed With Jobs and Without Jobs  
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NBER Working Paper No. 27886  
October 2020, Revised June 2021  
JEL No. E32,J63,J64

### **ABSTRACT**

Potential workers are classified as unemployed if they seek work but are not working. The unemployed population contains two groups—those with jobs and those without jobs. Those with jobs are on furlough or temporary layoff. This group expanded tremendously in April 2020. They wait out periods of non-work with the understanding that their jobs still exist and that they will be recalled. We show that the resulting temporary-layoff unemployment dissipates quickly following a spike. Potential workers without jobs constitute what we call jobless unemployment. Shocks that elevate jobless unemployment have much more persistent effects. Historical major adverse shocks, such as the financial crisis in 2008, created mostly jobless unemployment and consequently caused extended periods of elevated unemployment. The pandemic of 2020 created a large volume of temporary-layoff unemployment, mostly starting in April. It was mostly dissipated by the end of 2020. It also created a bulge in jobless unemployment.

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# 1 Introduction

In the labor-force statistics of the United States, an individual is unemployed if not working, but available for work, and either actively looking for work or on temporary layoff, waiting to return to an existing job. Until the pandemic hit the labor market in March 2020, the great majority of the unemployed fell into the first category—those actively looking for work—only a fraction of one percent of the labor force was on temporary layoff. Unemployment was effectively synonymous with joblessness. The pandemic prevented many millions of individuals from working, but they retained their jobs. The jobless population rose moderately, while the population of the unemployed on temporary layoff exploded.

Our two major findings are:

(1) Job-seekers classified as on layoff and expecting recall exit from unemployment much faster than job-seekers outside that category.

(2) Despite high overall unemployment rates early in the pandemic, the labor market measured from both the worker’s and the employer’s side remained reasonably tight during the pandemic in the sense that job-finding rates for active seekers remained above recession levels and job-filling rates for employers were generally low.

Job-seekers without jobs found new jobs at rates typical of historical years with unemployment rates at around 5 percent. Employers found that the time to fill a vacancy was fairly high by historical standards. We propose that, when using unemployment to measure labor-market tightness in times of unusual volumes of temporary-layoff unemployment, it is appropriate to use the unemployment rate for jobless unemployed in place of the overall unemployment rate. The overall unemployment rate, on the other hand, remains an appropriate measure of idled labor input and lost employment income.

We study the distinction between *jobless* unemployment and *temporary-layoff* unemployment, focusing on the experience of the pandemic that began in March 2020. We note that, in the regime created by a pandemic, total unemployment retains its social significance when there is an unusually high fraction of the unemployed who have retained their jobs. Higher temporary-layoff unemployment implies a burden on the economy from the decline in the utilization of available labor and a corresponding decline in the earnings of the labor force. However, there is a partially offsetting social benefit from the increased time available for household activities and the preservation of job-specific human capital among workers who do return to their previous jobs.

As noted above, a major difference between temporary-layoff and jobless unemployment is that temporary-layoff unemployment returns to normal much faster than does jobless unemployment. A decline in temporary-layoff unemployment takes place as economic conditions

improve and firms recall workers. No search or matching is involved—firm-worker match capital is preserved. In contrast, a decline in jobless unemployment takes time. Creation of new, stable, firm-worker relationships is a long and costly process. Terminated workers often circle through a number of short-term jobs before finding a stable job. For reasons we explore in another paper, jobless unemployment declines quite slowly but reliably during the type of economic recovery that typified the US economy from 1948 through 2019 (Hall and Kudlyak (2021)).

We note that the distinction between temporary-layoff unemployment and jobless unemployment is based on the expectation *ex ante* of recall. Not all individuals on temporary layoff return to their previous jobs. Some may become jobless unemployed, find new jobs, or leave the labor force. Workers remaining on temporary layoff may take interim jobs, in which case they show up in the data as employed, not as temporary-layoff unemployed. Conversely, jobless unemployed are sometimes recalled. Bartik, Bertrand, Lin, Rothstein and Unrath (2020) demonstrate that expectations of recall tend to be realistic.

Throughout the paper, we use four benchmark months to anchor our discussion: February 2020, the last month unaffected by the pandemic; April 2020, the month of maximal unemployment; November 2020, a month when most of the pandemic-induced unemployment had subsided; and May 2021, the last month of data available at the time of writing.

We find that the decline of total unemployment since its peak in April 2020 was much faster than the decline of unemployment in previous recoveries. Unlike in past recessions, most unemployment in April 2020 was temporary-layoff unemployment. And, as in past recessions, temporary-layoff unemployment returned to normal faster than jobless unemployment. Specifically, between February and April 2020, the total unemployment rate rose from 3.5 to 14.7 percent. In the subsequent seven months, through November, it declined by 8.1 percentage points. Between February and April 2020, the temporary-layoff unemployment rate rose from 0.5 to 11.5 percent. In the subsequent seven months, through November, it declined by 9.8 percentage points. By comparison, during the recovery from the 2007-09 recession, it took ten years for total unemployment to decline by 6.5 percentage points.

The huge wave of layoffs into temporary-layoff unemployment in April 2020 accounted for most of the incidence of temporary-layoff unemployment through November 2020. That is, in subsequent months, not many additional workers were laid off with indications of recall. Rather, there was a gradual departure of the April cohort as workers were recalled, changed to jobless unemployed, took interim or long-term jobs, or left the labor force.

The condition of the labor market can be characterized by how tight or slack the market is for the jobless unemployed. Prior to the pandemic, the overall unemployment rate was a reasonable guide to job-finding rates throughout the labor market. By that standard, the

labor market in November 2020, with overall unemployment at 6.7 percent, was slack. In historical times when unemployment was that high, jobs were hard to find. We show that the job-finding rate for the jobless unemployed fell in April but bounced back later. In November 2020, the job-finding rate among the jobless unemployed was the same as in the months of strong labor-market conditions a year earlier, in November 2019.

Because a substantial fraction of workers on temporary layoff are actually recalled and do return to their existing jobs, we generalize the concept of job-finding to encompass recall. We call the general process *work-finding*. For the jobless unemployed, the work-finding rate is synonymous with the job-finding rate, but for the unemployed on temporary layoff, the work-finding rate is considerably higher than the job-finding rate because it includes recalls.

In contrast to the pre-pandemic period, the movements of the work-finding rates for the jobless unemployed and temporary-layoff unemployed diverged during the pandemic. The work-finding rate for the temporary-layoff unemployed fell in April and remained below for an extended period. We show that this decline is due to the shift of the composition of the temporary-layoff unemployment towards temporary-layoff unemployed with longer durations that typically have lower work-finding rates. At the same time, the work-finding rate of the temporary-layoff unemployed with duration less than a month quickly bounced back after a dip in April.

As in the pre-pandemic period, during the pandemic, the work-finding rate among the temporary-layoff unemployed was twice as high as the rate among the jobless unemployed. This also holds true for the unemployed at durations of six months or longer. That is, even after waiting more than six months for recall to an existing job, some of the temporary-layoff unemployed returned to those jobs, avoiding the time-consuming search and matching process that the jobless unemployed typically experience.

This paper is about unemployment, but we should note that the pandemic resulted in a substantial decline in the labor force as well. Expansion of unemployment and of the population outside the labor market was accompanied by contraction in employment. In February of 2020, 36.6 percent of the working-age population was out of the labor force, neither working nor unemployed. The fraction out of the labor force rose by 1.9 percentage points to 38.5 percent in November and remained high through May 2021. The rise in the population out of the labor force in recessions is rarely this big. For example, in the recession that began in December 2007 and ended in June 2009, the fraction out of the labor force rate only rose by 0.3 percentage points. Analysis of the social consequences of the rise in the fraction of the population not in the labor force arising from the pandemic would proceed in parallel to the analysis of the rise in the unemployment rate.

## 2 Related Research

Feldstein (1976) launched an extensive literature on the role of temporary layoffs in labor dynamics. He found that an imperfect experience rating system in which firms did not pay the full cost of benefits accounted for a large portion of temporary layoffs and the resulting bulge in unemployment in a recession. Other work on this issue includes Topel (1983), Card and Levine (1994), Brown and Ferrall (2003), and Ratner (2014).

Fujita and Moscarini (2017) demonstrated the importance of recall in pre-pandemic data. They found that post-unemployment outcomes for recalled workers were substantially better than for those not recalled, a finding consistent with ours, using pandemic data. Their paper contains many references to other recent pre-pandemic work on recalls.

Alvarez and Shimer (2011) distinguish between *search* and *rest* unemployment. Search unemployment is a costly reallocation activity whereby a worker attempts to move to a better industry. Rest unemployment is a less costly activity whereby a worker waits for conditions to improve.

Gregory, Menzio and Wiczer (2020) is a mainly theoretical paper that is highly complementary to this paper. It emphasizes heterogeneity in the job-search process, including especially the difference between searchers with a prospect for recall and those without that prospect. The paper calibrates the model to the differing experiences of those groups and from other dimensions of heterogeneity in pre-pandemic data. It characterizes the central issue as the difference between a favorable V-shaped recovery, where the high re-employment rate of recalled workers dominates the recovery, and an unfavorable L-shaped recovery, where job losers undergo a time-consuming process finding new, stable jobs. With the pandemic-period data we assemble in this paper, the model can be calibrated more directly to the pandemic, and, based on results to date, would probably portray a more favorable recovery than Gregory and co-authors develop.

Gallant, Kroft, Lange and Notowidigdo (2020) build a detailed model of labor-market transitions based on distinguishing individuals by layoff status. The model's calibration is confirmed by studying pandemic-period data through July. A main thrust of the paper is the finding that the demand assumptions fed into the model forecast much less unemployment than do professional forecasters.

Forsythe, Kahn, Lange and Wiczer (2020) investigate labor-market tightness in the first six months of the pandemic, distinguishing job-seekers who are expecting recall from those not expecting recall and using vacancy data from Burning Glass Technologies.

Buera, Fattal-Jaefz, Hopenhayn, Neumeyer and Shin (2020) calculate how long it would take the economy to recover after social distancing restrictions were lifted. A key assumption

underlying the quick post-shutdown recovery is that workers who have been temporarily laid off in the shutdown can return to work without going through the normal hiring market. Our paper provides support for their assumption.

### **3 Measuring Temporary-Layoff and Jobless Unemployment in the Current Population Survey**

The Current Population Survey (CPS), designed and published by the Bureau of Labor Statistics (BLS), is the basis for the official estimates of the unemployment rate and related measures of labor-market status. We use the CPS to examine temporary-layoff and jobless unemployment, and related issues. See Hall and Kudlyak (2019) for details about creating panel data out of the public-use files for the CPS.

In the CPS, an individual is unemployed if they did not work during the week containing the 12th of the month, were available for work, and either actively searched for work or expected to be recalled to their previous job. Unemployed people are asked further questions to determine if their unemployment is a result of temporary layoff, permanent layoff, completing a temporary job, recently entering the labor force, reentering the labor force, or quitting a job. Unemployment on temporary layoff corresponds to temporary-layoff unemployment and the other reasons comprise jobless unemployment.

Specifically, the CPS questionnaire proceeds as follows. First, an individual is asked whether they did any work for pay during the reference week. Then they are asked whether they are on layoff from a job. If they are on layoff, the survey asks whether the employer has given a date to return to work or any indication that they will be recalled to work within the next 6 months. Finally, they are asked whether they could return to work if recalled. All individuals on layoff are also asked whether they did anything to find work during the last 4 weeks and, if so, to describe what they did. To be classified as unemployed on temporary layoff, an individual answers negatively to the question about work in the survey week, positively to the question about currently being on layoff, positively to the question about availability to return to work, and positively to either the question about employer having given a return date or to the question about recall indicated within 6 months.

In describing the logic of the CPS questionnaire, we treat the process for simplicity as if it gathered information directly from an individual about that individual’s labor-market status, but the CPS typically gathers information about a household from one person, the respondent, on behalf of other members of the household.

The CPS designates a category of “employed, absent without pay” whose members are not counted as unemployed. The BLS has indicated that some of them should be counted.

Only in the pandemic has this category had a meaningful number of members. It is likely that a significant fraction of the individuals assigned to this category were effectively temporary-layoff unemployed (BLS (2020)). None of the conclusions of this paper would be much affected by adding all of the members of this category to our measure of temporary-layoff unemployment, though the rate would be higher by several percentage points in the early months of the pandemic.

## 4 Temporary-Layoff and Jobless Unemployment before and during the Pandemic

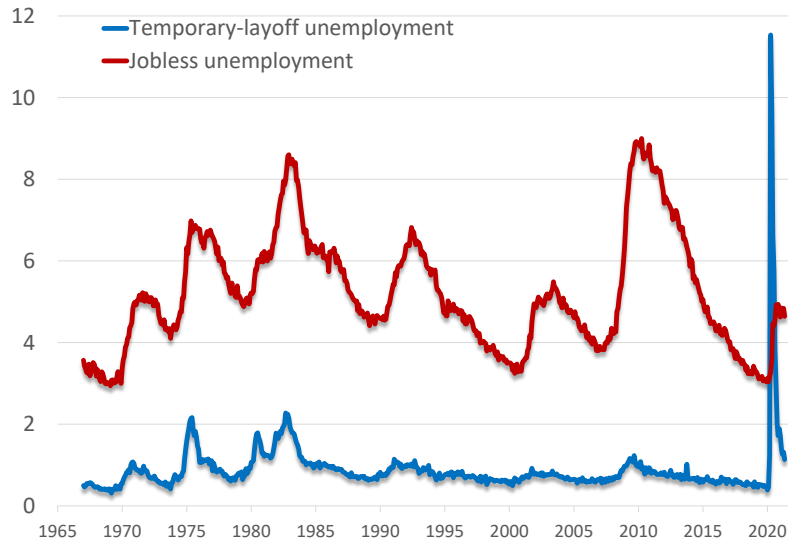
Figure 1, panel (a), shows the temporary-layoff and jobless unemployment rates, from January 1965 through the recent month. Until February 2020, the last month before the pandemic influenced the labor market materially, at all times temporary-layoff unemployment was small in relation to jobless unemployment. When the labor market was strong and unemployment low, the temporary-layoff portion was under one percent of the labor force, while jobless unemployment only dropped below four percent in the strongest years. In recessions, jobless unemployment rose to close to 9 percent of the labor force. In the recessions starting in 1974 and 1981, temporary-layoff unemployment touched 2 percent, but hardly rose at all in the later recessions of 1990 and 2001. Even the severe recession starting in 2007 saw an increase in the temporary-layoff unemployment rate of less than one percentage point.

Figure 1, panel (b), displays the data from January 2019 through the recent month. It portrays the totally different behavior of the two kinds of unemployment during the pandemic, starting in March 2020. At the peak in April, the temporary-layoff unemployment rate had skyrocketed to 11.5 percent, constituting 78 percent of total unemployment. The jobless unemployment rate rose only slightly, to 3.2 percent from its February value of 3.0 percent.

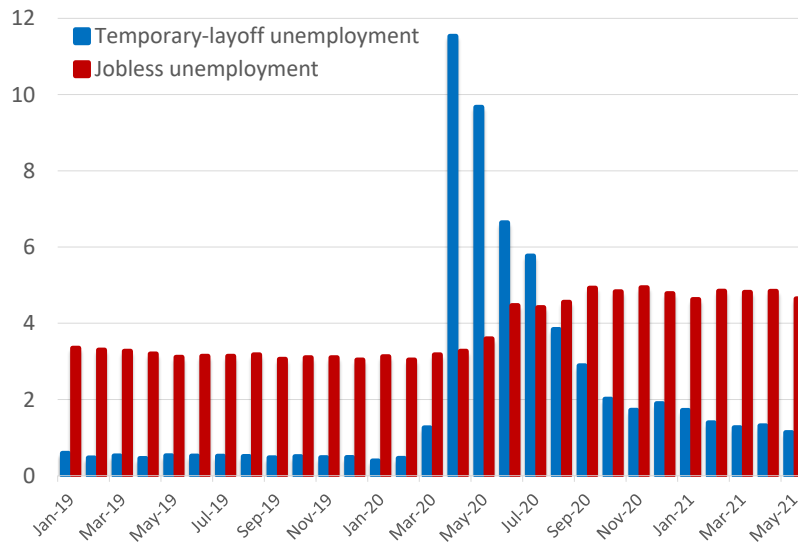
Temporary-layoff unemployment accounted for more than the entire increase in unemployment at the beginning of the 2020 pandemic. From March to April 2020, the aggregate unemployment rate increased by 9.9 percentage points. The temporary-layoff unemployment rate increased by 10.1 percentage points. The jobless unemployment rate declined slightly.

Figure 2 shows the temporary-layoff unemployment rate by duration. The fraction of the temporary-layoff unemployed with longer-duration increased during the year. In November 2020, the temporary-layoff unemployed with duration of 6 months or longer constituted 42 percent of all temporary-layoff unemployed individuals.





(a) Full Sample



(b) 2019-present

Figure 1: Temporary-Layoff Unemployment Rate and Jobless Unemployment Rate

Note: Temporary-layoff unemployment is unemployment on layoff with expectation of recall. Jobless unemployment is unemployment for other reasons. The two kinds of unemployment add up to the total unemployment rate. The series are expressed as percentages of the labor force and are seasonally adjusted. Data source: CPS.

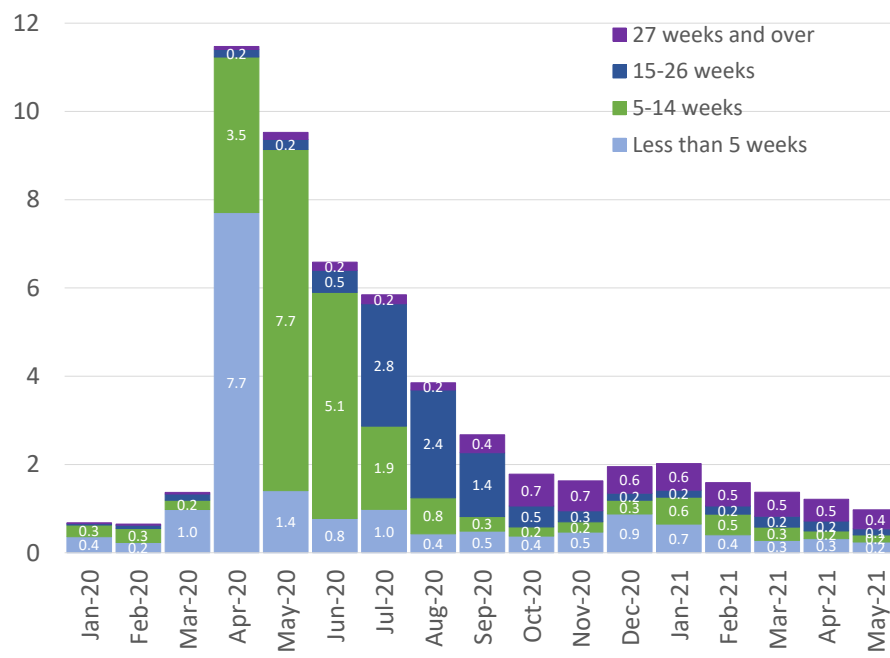


Figure 2: Temporary-Layoff Unemployment by Duration, as Percent of Labor Force

Note: The CPS data, monthly, non-seasonally adjusted.

In Figure 2, the lowest duration category, less than 5 weeks, serves as a measure of new layoffs into temporary-layoff unemployment. The figure makes it clear that there was a huge pulse of layoffs in April 2020, amounting to almost 8 percent of the labor force. Layoffs in later months were nowhere near as high. In May 2020, most of the workers on layoff had been laid off in April; new layoffs were small. That category also includes workers laid off in March and a few in February 2020. The big lump from April also showed up in June and July in the 5 to 14 week category. By August the lump had moved into the 15 to 26 week category. It was still visible at the end of 2020 in the 27+ weeks category, but by then, most of the lump had been recalled, had found jobs, or moved to jobless unemployment.

It is, perhaps, surprising that workers unemployed for longer than 6 months were still counted as on temporary layoff. But this finding is consistent with the CPS's definition of temporary layoffs. Workers on layoff who have been given an indication that they will be recalled to work within the next 6 months from the time of the interview are counted as being on temporary layoff.

It is useful to supplement the CPS data on the nature of pandemic unemployment with data from employers to see whether they paint a similar picture. First, employers may have more accurate information about the nature of layoffs than the workers in the survey. Second, the BLS slightly changed the interviewing process during the pandemic, which might have led to a larger fraction of layoffs counted as temporary as compared to the previous periods BLS (2020). A number of investigators have studied data from employers relating to the recent behavior of unemployment. The data from firms confirms the conclusions from the CPS that the majority of layoffs at the beginning of the pandemic were classified as temporary.

Bartik et al. (2020) provides some additional information about temporary-layoff unemployment beyond what is in the CPS. They use data from a company that provides payroll management services to small businesses, mainly restaurants, including a survey of their workers. Their results confirm that many workers on layoff or furlough expect to be recalled and that workers with this belief are often recalled. They also find that only a quarter of workers on layoff search for alternative employment. The most important reason for not searching is expectation of recall.

Using the Survey of Business Uncertainty, Barrero, Bloom and Davis (2020) document that the pandemic caused gross staffing reductions of 15 percent of March 1 employment between that date and mid-May and that 77 percent of these reductions were attributed to temporary layoffs and furloughs. Though the BLS does not use the term furlough, it is generally understood to be paid or unpaid leave from a job with an understanding that the worker will be recalled. Using data from the payroll processing company ADP, Cajner,

Crane, Decker, Hamins-Puertolas and Kurz (2020) find that temporary layoffs constituted about two-thirds of the decline in paid employment in the ADP firms. Kudlyak and Wolcott (2020) find similar results using filings on mass layoffs under the Federal Worker Adjustment and Retraining Notification Act.

From its peak in April 2020, the aggregate unemployment rate declined by 8.1 percentage points in seven months. During that period, temporary-layoff unemployment declined by 9.8 percentage points, accounting for more than the entire decline in total unemployment. In November, temporary-layoff unemployment was 1.7 percent and jobless unemployment was 4.9 percent, adding up to total unemployment of 6.7 percent (with rounding) (See Figure 1). In November 2020, temporary-layoff unemployment constituted 26 percent of total unemployment.

The decline of total unemployment since its peak in April 2020 was much faster than the decline of unemployment in previous recoveries. The share of temporary-layoff unemployment in total unemployment has been unprecedentedly high. Temporary-layoff unemployment returns to normal far faster than does jobless unemployment.

## 5 Labor-Market Tightness

One of the important contributions of the models of the labor market associated with Diamond, Mortensen, and Pissarides (DMP) is the formalization of the concept of tightness. The market is tight when people find work easily and quickly, and employers locate new workers with difficulty and slowly. The job-finding rate is one of the key metrics of tightness in the DMP framework. It is the probability that a non-working individual in a given month will be working in the following month. Given our emphasis on the distinction between temporary-layoff and jobless unemployment, we refer to the *work*-finding rate rather than the job-finding rate. The unemployed on temporary layoff do not necessarily look for jobs, as they have one from which they believe they are temporarily separated. The temporary-layoff unemployed seek to find work, often at their previous jobs. The work-finding rate can be measured directly from the CPS microdata. Note that it includes the probability that the worker will take a new job rather than wait for recall to an existing job.

The vacancy-unemployment ratio is the other key metric of labor-market tightness, usually called  $\theta$  in the DMP framework. We use data on vacancies at businesses from the Job Openings and Labor Turnover Survey (JOLTS).

The work-finding rate from the CPS and the vacancy-unemployment ratio are highly correlated. The high correlation is evidence of the validity of the DMP modeling approach. See Hall and Schulhofer-Wohl (2018) for discussion of these concepts and measures of rates

for a variety of originating activities, ranging from, on the one hand, active search without a job to, on the other, out of the labor market and unavailable for work.

## 5.1 The work-finding rate

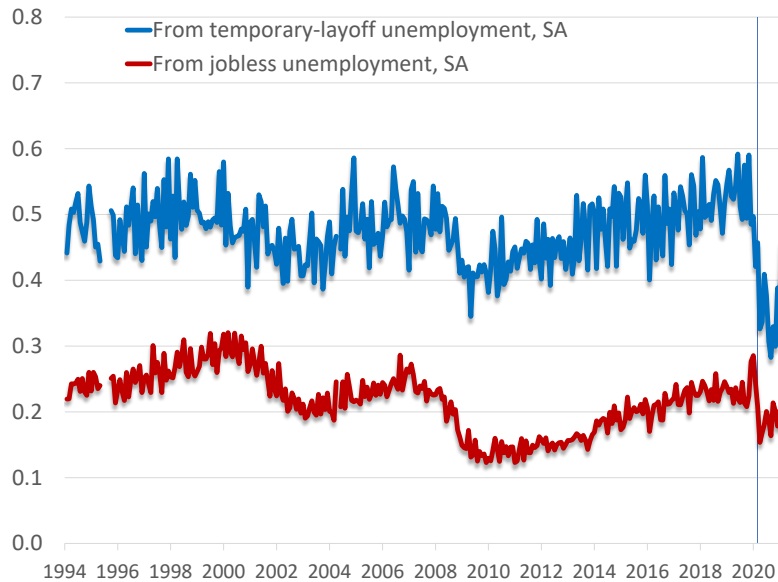
The work-finding rate is the probability that a person, observed in a given labor-market status in one month, is working in the following month. In tight labor markets with overall unemployment rates below 4 percent, the typical work-finding rate is roughly double its value in the worst slumps. Put another way, it takes twice as long to find work than it does when the labor market is strong.

One important question about the pandemic labor market is how tight or slack the market was for the jobless unemployed. For the jobless, the work-finding rate is the job-finding rate. Prior to the pandemic, the overall unemployment rate was a reasonable guide to job-finding rates throughout the labor market. By that standard, the labor market in November 2020, with overall unemployment at 6.7 percent, would be considered slack. In earlier times when unemployment was that high, jobs were hard to find.

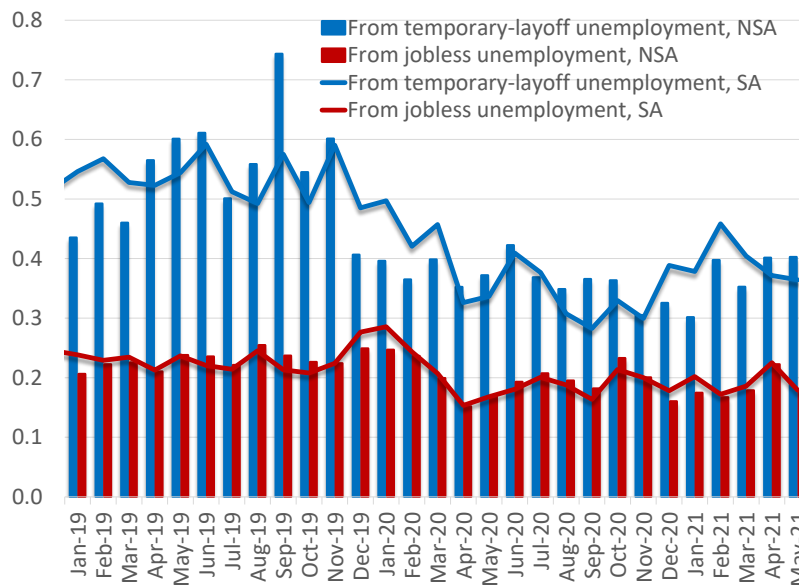
Figure 3 shows work-finding rates for people in the two categories of unemployment considered in this paper. Panel (a) shows rates in the full sample. The upper line is the frequency that a person in temporary-layoff unemployment in one month is working in any job in the following month. In most cases such a person was probably recalled rather than finding a new job, but, as we noted earlier, some people take a new job even though they were on recall for an existing job. The lower line shows the job-finding rate, the frequency with which a person in jobless unemployment in one month is working in the following month. The work-finding rate out of temporary-layoff unemployment is about double the job-finding rate for those in jobless unemployment. Both rates track the business cycle and were at high levels at the beginning of 2020.

Panel (b) of Figure 3 shows what happened in the pandemic. While prior to the pandemic, the work-finding rates of the temporary-layoff and jobless unemployed tracked the business cycle, the movements of the work-finding rates for the jobless unemployed and temporary-layoff unemployed diverged during the pandemic. The work-finding rate for temporary-layoff unemployed individuals fell in the months through November, relative to the average of the same months averaged over 2017, 2018, and 2019. The decline is larger compared to 2019 alone.

The work-finding rate for jobless unemployed people fell noticeably in April but, in contrast to the rate for the temporary-layoff unemployed, it bounced back in May. In November 2020, the work-finding rate from jobless-unemployment was the same as a year earlier. During the seven months after the unemployment peak in April 2020, the work-finding rate of



(a) Full Sample



(b) 2019-present

Figure 3: Work-Finding Rates for Temporary-Layoff and Jobless Unemployed

Note: The figure shows the rate at which the unemployed transition into employment from one month to the next, with the later month labeled on the horizontal-axis. The lines in panels (a) and (b) show the series using Shimer's (2012) seasonal adjustment procedure. The bars in panel (b) show the series without seasonal adjustment. The vertical line in panel (a) indicates March 2020. Data source: CPS micro data.

the jobless unemployed was higher than would have been expected historically given the high level of the overall unemployment rate in those months.

Figure 4 shows the work-finding rates of the temporary-layoff and jobless unemployed with durations less than one month (panels (a) and (c)) and durations longer than 6 months (panels (b) and (d)). The figure shows that the decline in the work-finding rate from temporary-layoff unemployment was the result of the shift of the composition of the temporary-layoff unemployment towards temporary-layoff unemployed with longer durations that typically have lower work-finding rates. Specifically, the work-finding rate of short-term temporary-layoff unemployed dipped in April 2020 recovered later. The work-finding rate of long-term temporary-layoff unemployed remained steady through the year. This category was scarcely populated prior to the pandemic because rarely did the temporary-layoff unemployed remain in that state for longer than 6 months. The category exploded during the pandemic. In the CPS sample, the monthly counts of the unemployed on temporary layoff with durations of 6 months and over in 2020 were 25 and below until April, between 50 and 66 in May-August, and reached 310 in September and 286 in October.

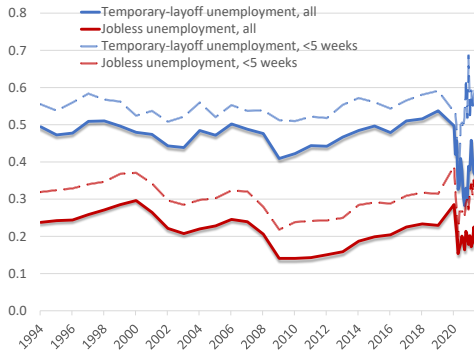
As in the pre-pandemic period, during the pandemic, the work-finding rate among the temporary-layoff unemployed was twice as high among the jobless unemployed. This also holds true for the unemployed at durations of six months or longer.

## 5.2 The vacancy-unemployment ratio

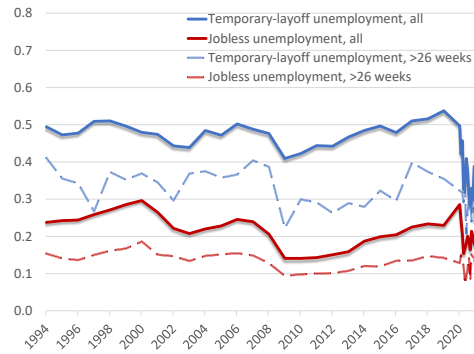
When the vacancy-unemployment ratio is low—vacancies are scarce while job-seekers are plentiful—jobs are hard to find and the labor market is slack. Alternatively, when the vacancy-unemployment ratio is high—vacancies are plentiful and job-seekers are scarce—vacancies are hard to fill and the labor market is tight. That is, the vacancy-unemployment ratio is low in slumps and high in booms.

The appropriate measure of vacancies should include those vacancies that are available for any job-seeker and not those positions that are being held for the workers to be recalled. This is what JOLTS measures. The appropriate measure in the denominator of the vacancy-unemployment ratio should include only those job seekers who actively search for jobs, not those who are waiting for recall. We therefore construct the vacancy-unemployment ratio as a ratio of vacancies from JOLTS to the number of jobless unemployed in the CPS. We note that the pool of jobless unemployed is a lower bound on the number of job-seekers among the unemployed because some temporary-layoff unemployed also engage in active search.

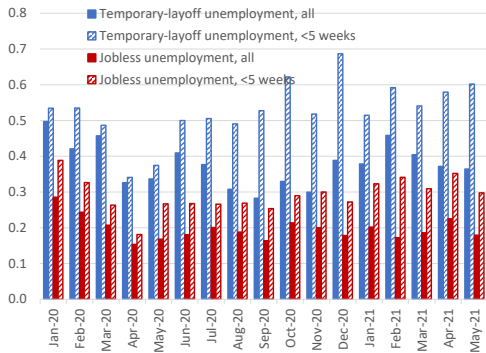
Figure 5 shows the ratio of vacancies to the jobless unemployed. Panel (a) shows the series for the full sample period and panel (b) zooms in on the pandemic. During the pandemic,



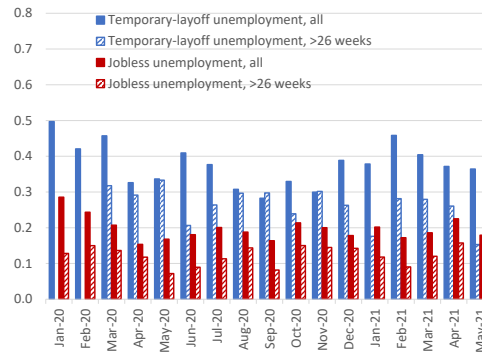
(a) All and short-term, full sample



(b) All and long-term, full sample



(c) All and short-term, 2020-present



(d) All and long-term, 2020-present

Figure 4: Work-Finding Rates for the Temporary-Layoff and Jobless Unemployed, by Duration

Note: The figures show the rate at which the unemployed transition into employment from one month to another, with the latter month labeled on the horizontal axis. The series are annual averages of the seasonally adjusted series up to 2019, and monthly series thereafter. The series are calculated only for the months with 10 or more unemployed individuals in the CPS sample.



the vacancy-to-jobless-unemployment ratio dropped from 1.4 to 0.8 and remained at that level. For comparison, the ratio dropped to 0.2 during the 2007-09 recession.

Both measures of labor market tightness—the work-finding rate of the jobless unemployed and vacancy-to-jobless-unemployment ratio—show that the pandemic labor market was tighter than would be inferred from the overall unemployment rate. They agree that the labor market was less favorable for job-seekers than it was in the exceptionally strong market of 2019, but not as weak as the standard unemployment rate would suggest. The moderate increase in the jobless unemployment rate over its 2019 level confirms that conclusion.

### 5.3 The Beveridge curve

The Beveridge curve is a graph with unemployment on the horizontal axis and vacancies on the vertical axis. When the labor market is tight, vacancies are numerous and unemployment is low; the labor market is at a point up and to the left on the Beveridge curve. When the market is slack, vacancies are scarce and unemployment is high, down and to the right on the curve.

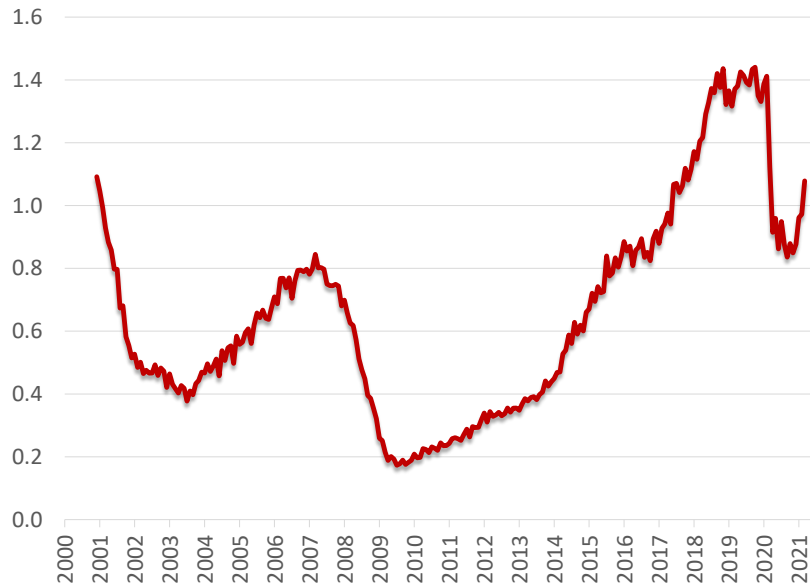
Overall unemployment rose much more than would be consistent with the pre-pandemic Beveridge curve, given the behavior of vacancies. Jobless unemployment, when placed on the horizontal axis instead of overall unemployment, results in a reasonably stable new version of the Beveridge curve (see, for example, Gallant et al. (2020)).

Because the Beveridge curve uses the same data on job-seeking and recruitment as in the vacancy-unemployment ratio above, it would be redundant to present the data here in the Beveridge-curve format—it would not add to the strong case that jobless-unemployment plays a similar role in the pandemic labor market to the role that overall unemployment did in earlier recessions.

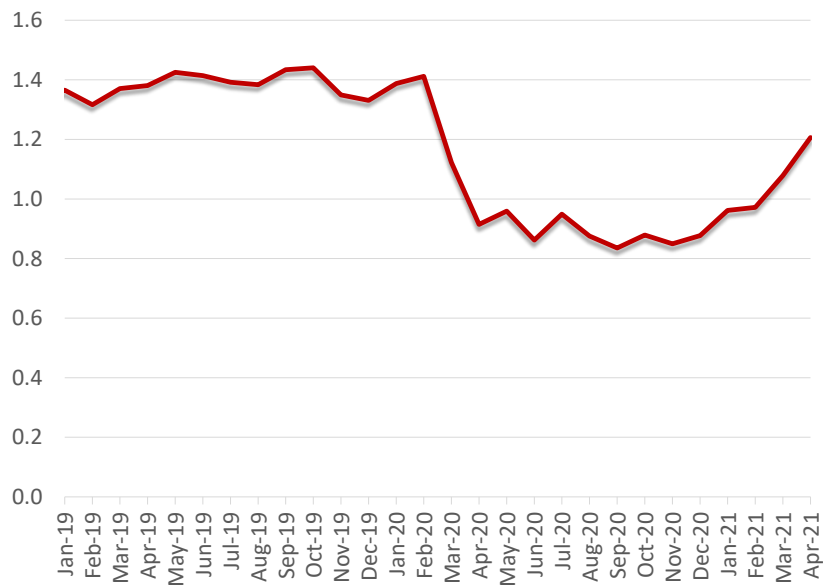
## 6 Social Costs of Temporary-Layoff and Jobless Unemployment

Both a temporary-layoff unemployed person and a jobless unemployed person are not working despite a likely inclination to work. There is a gross social loss of the output the worker would have produced while at work, netted against the value the worker can find by productive or enjoyable use of the time freed up by not working. Thus, the social cost of a month of temporary-layoff unemployment is at least approximately the same as the cost of a month of jobless unemployment.

On the other hand, because monthly work-finding rates are substantially higher for those in temporary-layoff unemployment than those in jobless unemployment, the social cost of



(a) Full sample



(b) 2019-present

Figure 5: Vacancy-Unemployment Ratio

Note: Vacancy data from JOLTS. Unemployment data from the CPS. Both series are seasonally adjusted.

a layoff with recall prospect is typically well below the social cost of a layoff without that prospect. This is because the expected spell of lost productivity is so much shorter. And the job-finding rate of a worker in jobless unemployment understates the expected duration back to a job with productivity equal to the earlier job, because the first job or two may be interim jobs, less productive than the job that the worker eventually settles into. Put differently, the worker in temporary-layoff unemployment has a good chance of returning to a position up the job ladder, while the worker in jobless unemployment drops to the bottom of the ladder.

## 7 Concluding Remarks

A pandemic can trigger a severe recession, with a higher percentage of workers inactive than in the worst past recessions and a corresponding huge drop in output. Fortunately, the subsequent decline in unemployment in the pandemic was much more rapid than in past recessions.

The evidence is reasonably clear that there are two basic kinds of unemployment behind these developments. The shutdown of major sectors of employment led many employers to idle their workers, but to indicate to them that they should plan to be recalled to their jobs. Temporary-layoff unemployment, previously a sideshow in labor dynamics, became the bigger component of total unemployment almost overnight. Soon, temporary-layoff unemployment began to decline, replaced in small part by a rise in jobless unemployment. Total unemployment receded much faster than in earlier recessions.

Tightness in the labor market, revealed by the job-finding rate for active, jobless unemployed individuals, declined early in the pandemic, but not to typical recession levels, and then rose to pre-pandemic levels. Tightness, revealed by the vacancy/jobless-unemployment ratio, declined but not to the recession levels suggested by the level of the total unemployment rate.

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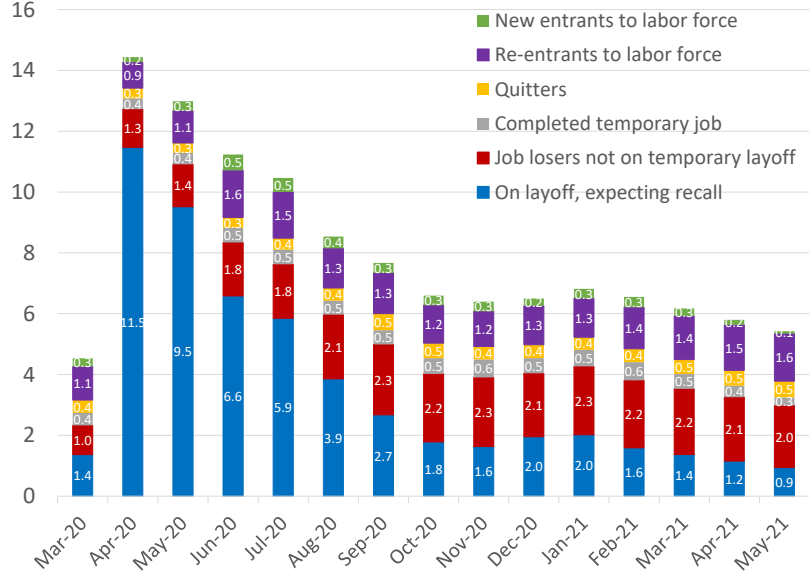
## Online Appendix

### A Change in Unemployment during the Pandemic

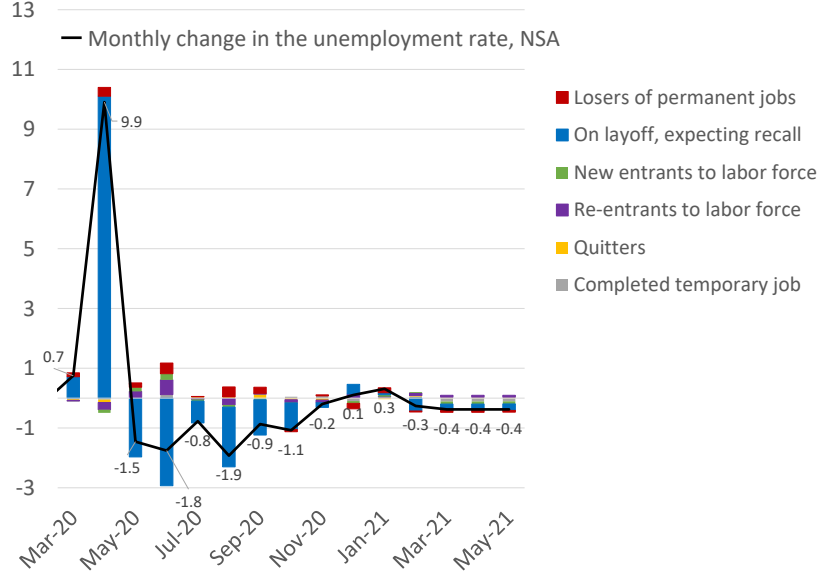
Figure A.1 shows the month-to-month change in unemployment during the pandemic, and the contributions of each of the six reasons to the change (colored bars, not seasonally adjusted). From March to April 2020, the aggregate unemployment rate increased by 9.9 percentage points. The recall-unemployment rate increased by 10.1 percentage points. The jobless-unemployment rate declined slightly. Since April, most decline of the total unemployment is from temporary- layoff unemployment. Jobless-unemployment climbed from 3.2 percent in April to 5.0 percent in September. It remained close to this level in November.

### B Vacancy/Unemployment Ratio

Figure B.1 shows the ratio of vacancies to jobless unemployment (burgundy line) and, for comparison, the ratio of vacancies to all unemployment (dark gray line). During the pandemic, the vacancy/jobless-unemployment ratio dropped from 1.4 to 0.8 and remained at that level. For comparison, the ratio dropped to 0.2 during the 2007-09 recession. The vacancy/total-unemployment ratio shows a more dramatic decline during the pandemic and a fast bounce back—it dropped from 1.4 to 0.2 and bounced back to 0.6 in later months. This measure is not accurate because the denominator includes temporary-layoff unemployment while the numerator does not include any counterpart.



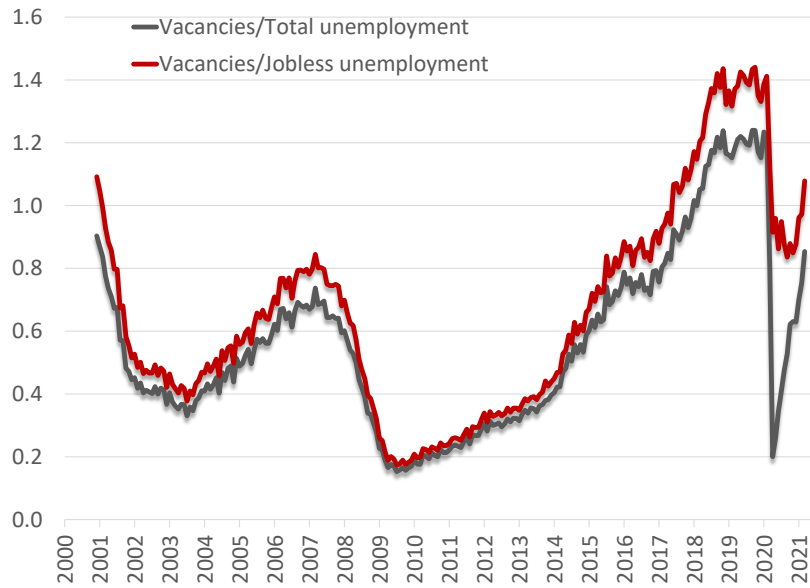
(a) Level of unemployment



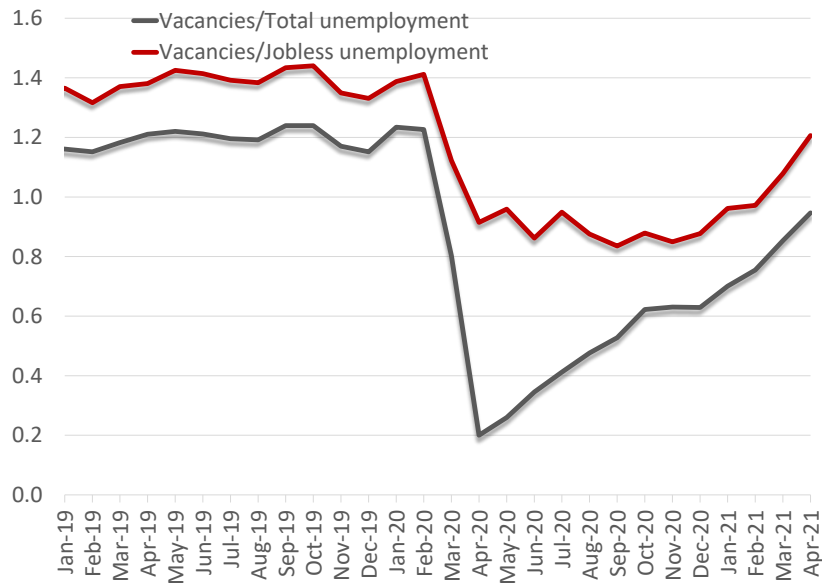
(b) Monthly change in unemployment

Figure A.1: Contribution of Layoffs with Expected Recall and Other Reasons to Unemployment during the Pandemic, Percent of Labor Force, Not Seasonally Adjusted

Note: The numbers in panel (a) show the level of unemployment in each category. The numbers in panel (b) show the monthly change in total unemployment. The series are expressed as percentages of the labor force, not seasonally adjusted.



(a) Full sample



(b) 2019-present

Figure B.1: Vacancy-Unemployment Ratio

Note: Vacancy data from JOLTS. Unemployment data from the CPS. Both series are seasonally adjusted.