TECHNICAL APPENDIX

NOVEMBER 19, 2020

CALIFORNIA POLICY LAB

An Analysis of Unemployment Insurance Claims in California During the COVID-19 Pandemic

ALEX BELL, THOMAS J. HEDIN, GEOFFREY SCHNORR, and **TILL VON WACHTER**

SUMMARY

Since the start of the COVID-19 crisis in March 2020 nearly 45% of the California workforce has filed for unemployment insurance (UI) benefits - a labor market crisis unprecedented in the state's history. This series of policy briefs uses close to real-time information on daily initial UI claims in California from the state's Employment Development Department to better understand the magnitude of COVID-19's labor market impacts and how different types of workers are experiencing these impacts. This research is based on a partnership between the Labor Market Information Division of the California Employment Development Department and the California Policy Lab, a research center at the University of California, with sites at the UCLA and Berkeley campuses.

Exhaustion Methodology

This technical appendix projects estimates on when claimants who are currently receiving benefits will completely exhaust those benefits, and estimate how many claimants will have done so at various points in time. This is done by taking a stock of claimants who are currently receiving benefits, calculating their potential benefit duration (PBD), estimating the week when they would exhaust if they were to use all benefit weeks they are eligible for, tallying these exhausted claimants up, and then adjusting for the fact that some of them will instead find work prior to their exhaustion date. The entire projection is run separately for claimants currently on PUA vs regular UI.

Step 1: How long are claimants eligible to receive benefits for?

A. Potential Benefit Duration for Regular UI Claimants

In California, Regular UI claimants are eligible to receive the minimum of 26 weeks of benefits or the equivalent of one half of their **Base Period Wages (BPW)** (i.e., the total earnings in their base period, which is 4 quarters for most claimants). This means that the **Maximum Benefit Amount (MBA)** for a claimant is the minimum of {26*WBA, 0.5*BPW}. We directly observe each claimant's MBA in the UI claims data.

We are also able to observe payment amounts that UI claimants receive when they certify for benefits. We can use this to calculate their **Benefits Received (BR)**, and how much of their MBA they still have available at any point in their UI spell: MBA - BR = **Remaining Benefits Available (RBA).** If we take their remaining benefits and divide this amount by their WBA, we end up with what we call their **Potential Benefit Duration (PBD) for Regular UI.** The PBD tells us when claimants would exhaust their regular benefits if they claimed benefits at the full amount for every week remaining. For those individuals that claimed their full benefit amount in the past, we assume that they will claim their full benefit amount in the future until they exit.

Some claimants receive less than their full WBA each week, because they are working reduced hours and receiving partial UI benefits. To account for this, we assume that claimants that were already receiving partial UI benefits will continue to utilize partial UI in the future at the same rate at which they have in the past. To implement this assumption, we take the mean of all *nonzero* payments to form a weekly **Expected Payment Amount (EPA)**.

By assuming claimants will continue to receive their expected payment amount going forward, we can calculate their **Expected Benefit Duration for Regular UI (EBD_Regular)** by dividing their RBA by their EBA (EBD = RBA/EBA). Essentially, we are evenly distributing their Remaining Benefit Amount (RBA) evenly in the future based on the weekly benefit rate they have been receiving in the past (the Expected Benefit Duration). A claimant's Expected Benefit Duration for Regular UI is our best estimate of the number of weeks until they exhaust regular UI benefits, if they do not find employment beforehand.

Note that we do not include $0 payments when calculating the EPA. A zero payment can occur in our data if claimant had exited the program, was employed, and then reopened his previous claim within the benefit year. This is referred to as an "additional" claim. (Zero payments can also occur if an individual does not certify for other reasons - we treat this case similarly.) We made this choice because we did not want to complicate our model further by forecasting the rate at which past claimants *return* to UI (after having exited) after being laid off again (i.e., filing an additional claim). For the same reason, we are also not factoring in potential future new claimants in our tally of exhaustions,

If a claimant is still unemployed after having received their MBA in regular UI benefits, EDD automatically files a claim on their behalf for Pandemic Emergency Unemployment Compensation (PEUC) benefits (so long as this occurs before December 26, 2020, when PEUC expires), which provides 13 weeks' worth of benefits. Thus, just as with the standard UI benefits, we calculate the how many weeks these are *expected* to last (**EBD_PEUC** = 13*WBA / EPA). However, since PEUC has an expiration date, we adjust EBD_PEUC such that it does not extend past December 26th.

Once claimants have used their PEUC benefits (or the program has expired), they then transition to FED-ED, if they are eligible. FED-ED has stricter eligibility requirements than does PEUC or regular UI. (See here.) We are able to directly calculate this eligibility for the large majority of claimants in our sample. (For the small share of those who we cannot directly calculate eligibility, we conservatively assume they will be eligible.)

The vast majority of claimants who are eligible for FED-ED can receive an additional 20 weeks' worth of benefits. Similar to before, we estimate how long these benefits would actually last for each claimant based on their realized past weekly benefit rate (**EBD_FED_ED =** 20*WBA / EPA if FED-ED eligible, otherwise 0.)

For claimants who are ineligible for FED-ED benefits, if the date they exhaust PEUC is before the end of the year, we assume they will transition to a PUA claim. If they do transition to a PUA claim, they are able to claim up to 46 weeks' worth of *total* benefits (Regular UI + PEUC + PUA) (See here). If the claimant uses all 46 weeks' worth before the expiration of PUA (again assuming they continue receiving their expected payment amount), they are considered to have exhausted at that date. Otherwise, the claimant is eligible to receive PUA until December 26th 2020 (when PUA expires). Thus for each claimant, we generate the number of weeks they would be expected to receive PUA benefits: **EBD_PUA**.

Finally we combine the 4 types of benefit programs to form a **Total Expected Benefit Duration** (EBD_Total = EBD_Regular + EBD_PEUC + EBD_FED_ED + EBD_PUA). This is the number of weekly payments remaining until the claimant would exhaust if they were to continue claiming UI. We add these weeks onto the start date of the projection (September 5th) to estimate when the claimant would exhaust if they remain unemployed (**Expected Exhaustion Week)**.

B. Potential Benefit Duration for PUA Claimants

For individuals whose initial claim is from PUA, the Potential Benefit Duration in California is 46 weeks, if those weeks do not extend past December 26th (i.e., their EBD_PUA = 46). If those weeks *would* extend to the end of the year, the date of exhaustion is December 26th 2020.

Step 2: How many claimants will exit UI before exhausting?

We know that many claimants will *find a job* before they exhaust UI benefits - some will either get re-hired by their previous employer or find new work elsewhere. We call this "exiting" from UI. In our data, we say an individual **exited** in a given week if starting that week they went at least 2 consecutive weeks without certifying for benefits. (In California, claimants are supposed to certify every other week.) The driving factor in our projection is the rate at which claimants exit UI: if more claimants exit, then fewer remain to exhaust their benefits. If fewer claimants exit, then there are more claimants remaining to exhaust benefits. We define an exit *rate* as the percentage of all claimants certifying for benefits in a week who do not certify in the next two weeks.

In order to estimate how many claimants will exit UI in the future, we use exit rates from the past. The first panel of Figure 13A illustrates exit rates for both PUA and regular UI claimants. Our base model takes the average exit rates over the latest 10 weeks of data. For regular UI, 3.4% of claimants who certified in a given week proceeded to then exit, on average, and has ranged from 1-7% over the course of the crisis, but between 2-5% since mid-May. For PUA, the 10-week average was significantly higher, at 5.6% - though the recent uptick in PUA exits may partially be driven by EDD's recent crackdown on potentially fraudulent claims. While our base model uses the 10-week average exit rate, we also explored how our estimate changes based on this assumption: lowering the exit

rate for PUA claimants which we see in the data by 20 percent leads to an increase our projected PUA exhaustions by 118,461. (For a total of 701,138 individuals exhausting by December 26th). For our projection of regular UI exhaustions, we illustrate the effects of various exit rate assumptions in Figure A4.

We use our estimates of the future exit rates to project the number of claimants that will actually exhaust benefits in the following way. We take a stock of individuals receiving benefits at a given baseline date (more on this date below). We then split this stock of claimants into groups based on their expected exhaustion week. For individuals who first certified for benefits in March, receive full UI benefits (i.e., without partial UI), and are eligible for the full 26 weeks of regular UI, PEUC, and FED-ED benefits, this week will be the calendar week of first certification plus 59 weeks (=26+20+13). But some individuals are projected to exhaust later (because they receive partial UI and can spread benefits over more weeks) and some individuals will exhaust earlier (because they are eligible for less than 26 weeks of regular UI benefits, or they are not eligible for Fed-ED, or they have remaining PEUC benefits when the program expires).

For each of these groups, we then estimate how many claimants will remain on UI until their exhaustion week. The fraction of individuals that stay in UI in a given week (or "survives") can be obtained from the exit rate: **Survival Rate = 1 - Exit Rate**. We thus obtain for the first week of the projection:

$$Claimants\ Surviving_t = Claimants\ Surviving_0 \times Surival\ Rate$$

where the start date (t=0) is the week at which we take the stock of current claimants and begin projecting forward. We then repeat this step for each week in the future until we reach the projected exhaustion week. For example, in the second week we estimate the number of claimants surviving as:

$$\begin{aligned} Claimants\ Surviving_2 &= Claimants\ Surviving_1 \times Surival\ Rate \\ &= Claimants\ Surviving_0 \times (Surival\ Rate)^2 \end{aligned}$$

Thus, we can use our constant Survival Rate to project the number of individuals remaining in UI any week into the future. (If the Survival Rate were to change over time, the argument would be similar but more complicated.)

To see how we use this approach to project the number of individuals that exhaust, it helps to consider a concrete example. In the UI report, our baseline projection begins on September 5th. We use this start date to calculate **Weeks Until Exhaustion** as (Expected Exhaustion Week - September 5th week). We do this separately for every group of individuals that has a separate exhaustion week (our "exhaustion week groups"). With this, we can take the estimated number of claimants who are in our sample as of our start date (September 5th), and project forward how many of them we expect to "survive" until their exhaustion week. Thus, for each exhaustion week group, we calculate the following:

$$Claimants\ Exhausting_0 = Claimants_0 \times Surival\ Rate^{(Weeks\ until\ exhaustion)}$$

Each group corresponds to just a single week where people might exhaust, and the number claimants who survive until that week are the total number of projected exhaustions occurring in that calendar week. By summing all surviving claimants across the groups, from the first week/group of our projection to any given week/group of interest, we can find the cumulative number of exhaustees up to that point.

The rate of benefit exhaustion among individuals receiving benefits in the baseline period (period 0) in this scenario depends on the survival rate:

$$Benefit\ Exhaustion\ Rate_\tau = Claimants\ Exhausted_\tau \times Claimants_0 = \frac{(\sum_{t=0}^{\tau} Claimants\ Exhausting_t)}{Claimants_0}$$

Projection by Demographic Groups

In order to allow projected exhaustion rates to vary across demographic groups, we can calculate a different mean exit rate for each group. These exit rates are illustrated in figure 12 of the report.

We have also assessed whether exit rates -- for the whole sample and demographic groups -- vary by the date individuals first receive UI benefits (i.e., whether exit rates vary by entry cohorts). We found there was little variation in mean exit rates by cohorts, and hence chose to use a single exit rate for each cohort. As a result, the exit rate for the full sample (and within each demographic group) is constant.

How is our sample defined?

Our projections are based on a stock of claimants that receive benefits corresponding to a given week of unemployment. We use this instead of the week of certification (which is published by DOL), since individuals can retroactively certify for benefits in any given week. This matters, since the amount of potential UI benefits remaining depends on the weeks for which benefits were actually received, not on the date of certification.

To calculate exhaustions, we use an estimate of the current stock of individuals receiving unemployment benefits. Ideally, we would project exhaustion for all claimants who are currently unemployed (receiving UI benefits for the current week). Since certification is often retroactive, this group of claimants is imperfectly observable---many of these payments will not show up in the data for several weeks. The baseline projection includes all claimants who certified for benefits at least once for a week of unemployment experienced between September 5th and October 31st (the latest available date in our data at the time we wrote the November UI report). Why do we choose this time window? From the data we have found it takes roughly 8 weeks to get a stable estimate of the true number of individuals receiving benefits corresponding to a certain week of unemployment. (i.e., payments *for* a given week are added to the data up to 8 weeks after that week.) Hence, we believe the week ending 9/5 is far enough in the past that we can observe all such payments.

To this group we add individuals who were not paid for the week of 9/5 but were paid for one or more weeks after 9/5 up to 10/31. We add these individuals to be as inclusive as possible of individuals receiving benefits and

being at risk of exhaustion. Note that if these claimants are new to the UI system, they will have a full 26 weeks' worth of regular UI, and are thus unlikely to exhaust regular UI benefits at the same time as the rest of our sample, most of whom have been unemployed since March. However, some of these will be additional claimants, reopening a claim after being laid off a 2nd time. If we were to exclude these claimants, we would be under-estimating the number of claimants who may be likely to exhaust benefits.

Some claimants observed receiving payments for the week of 9/5 but not after will have already exited the program (something we cannot yet see as of 10/31 because of lags in certification and because we have to measure exits by looking for a gap in certification). Our exit rate projections account for the fact that some of the individuals in our sample may have started exiting before 10/31. On the other hand, some claimants who will eventually be paid for weeks after 9/5 are not yet observable, and we cannot account for this. This means our exhaustion sample is likely a subset of the population of interest.

Why do we not simply restrict the sample to only include claimants who receive benefits for the latest week? The processing delays we observe in the data imply that limiting the sample to just claimants who received benefits for unemployment experienced in the week ending October 31st would exclude many claimants who experienced unemployment in that week, but whose certifications arrived later.

Why don't we restrict our sample to those individuals claiming in the week ending October 17th? We have found in the data that the lags of benefit approvals and certification cause estimates of the number of the number claimants receiving benefits to be artificially low up to X weeks past that date. In other words, we are likely to substantially undercount the number of individuals receiving benefits for the 2-3 weeks occurring before October 31st, the end of our current sample window. While for the main text, we use the week ending October 17th in order to be as close to the current date as possible. However, for our forecast we prefer to err on the side of being inclusive.

How do these results differ from the November 18th report from The Century Foundation?

The TCF report represents a substantial undertaking to forecast exhaustions both nationally and at the state level. Whereas our report forecasts that at the end of the year in California 582,677 current PUA claimants and 166,086 current regular claimants will exhaust all benefits, the TCF report's Table 1 projects that for California, 1,612,317 PUA and 0 regular claimants will exhaust from California. We have identified three main reasons why our projections differ.

First, the difference in projections for regular claimants is because the TCF report approximates that all regular UI claimants in California will be eligible for FED-ED, California's version of Federal-State Extended Benefits. Using individual-level data, we are able to identify a substantial number of current claimants whose earnings in their base period will not meet the federal cutoff.

Second, our projection methodologies for early exit rates differ substantially, as ours are based on individual-level data and include information on the PBD of individual claimants---which I variable in California.

Third, and likely most importantly, we start from a much smaller sample of current PUA claimants than that used by the TCF report. As discussed above, we select only unique claimants who were paid for unemployment experienced recently, *not payments made recently* to claimants who were unemployed (at any time). Thus, our PUA sample of current claimants used for projection is the 1,442,290 *claimants* who have filed a claim for unemployment experienced since September 5th, as opposed to the 2.2 million PUA continuing claims *payments* DOL reported for California in the week ending October 31st.

What happens if we adjust the sample date range?

A potential concern might be that these early approvals or certifications might be a selected sample of individuals. As robustness, to see whether our exhaustion rates are affected, we also considered two additional baseline samples: Individuals receiving benefits at any point between 9/5 and 10/10, and individuals receiving benefits during the week ending on 10/17. This latter sample may be the most conservative sample - while this is likely to still exclude some individuals that are actually receiving benefits during that week, it also excludes potential individuals that were receiving benefits between 9/5 and 10/10 that may have already exited.

For inquiries about the definitions and methodology in this technical appendix, please contact Till von Wachter. Email: tvwachter@econ.ucla.edu.

To obtain the data tabulations used in the underlying policy brief, please contact: Dr. Muhammad Akhtar, Deputy Division Chief, Labor Market Information Division, California Employment Development Department. Email: Muhammad.Akhtar@edd.ca.gov.