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Lost Generations: Long-Term Effects of the COVID-19 Crisis on Job Losers and Labour Market Entrants, and Options for Policy[*]

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Abstract

This paper discusses the potential long-run effects of large-scale unemployment during the COVID-19 crisis in the labour market on vulnerable job losers and labour market entrants in the United States. The paper begins by contrasting measures of the scale of job loss during the crisis. These measures are paired with estimates from past recessions indicating that the costs of job loss and unemployment can reduce workers' earnings and raise their mortality for several decades. Focusing only on a subset of vulnerable job losers, the potential lifetime earnings losses from job loss related to the COVID-19 pandemic are predicted to be up to $2 trillion. Related losses in employment could imply a lasting reduction in the overall employment–population ratio. For these workers, losses in potential life years could be up to 24 million. Even at the low range, the resulting estimates are substantially larger than losses

in potential life years from deaths directly due to COVID-19. New labour market entrants are at risk to suffer long-term losses in earnings and mortality as well. Based partly on experiences in other countries, the paper discusses potential reforms to short-time compensation programmes and unemployment insurance, which could help limit the short- and long-term harm from layoffs going forward.

I. Introduction

The United States has experienced the worst short-term drop in employment and GDP in post-World War II history. Since mid-March 2020, about 50 million claims for Unemployment Insurance (UI) have been filed, unemployment rates have skyrocketed to 16 per cent, and employment initially fell by 25 million. In July 2020, 30 million individuals reported being unable to work or had to work reduced hours because of the COVID-19 crisis, down from 50 million in May. Almost six months into the recession, weekly initial claims to UI continue to be substantially higher than before the crisis, and the incidence of repeat layoffs has risen sharply.

Evidence from past recessions in the United States and other countries implies that those workers most directly affected – job losers and young labour market entrants – can suffer persistent earnings losses, reductions in employment, and long-term increases in mortality.[1] Given the large amount of job losses, the economic crisis induced by COVID-19 could lead to substantial losses in earnings, unemployment, and increased mortality for affected workers lasting for decades to come. High but declining rates of reported temporary layoffs and expected recall among UI claimants in this crisis may imply a faster recovery. Yet, most projections predict that the recession will last well into 2021. Moreover, increasing signs suggest that a significant amount of the large initial amount of job loss may be permanent, implying a substantial amount of workers at risk of long-term costs of layoff.[2]

Taking estimates from the empirical literature and the approximate number of the total amount of vulnerable job losers during the COVID-19 crisis from the United States, back-of-the-envelope calculations suggest a loss of over $2 trillion in lifetime earnings and 23 million work years, accruing over individuals' working lives.[3] The corresponding loss in life years, accruing over

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[1]See von Wachter (2020) for a summary on the literature on persistent effects of initial labour market conditions. Davis and von Wachter (2011), Morissette, Zhang and Frenette (2007), Upward and Wright (2019), Schmieder, von Wachter and Heining (2020) and Eliason and Storrie (2006) provide comparable estimates of the long-term effects of job loss for the United States, Canada, the United Kingdom, Germany and Sweden, respectively.

[2]See, for example, Barrero, Bloom and Davis (2020) and Chodorow-Reich and Coglianese (2020).

[3]Each of the 3.6 million unemployed can expect to lose 2.5 earning years on average, giving 9 million total earnings years. Dividing this by 40 remaining working years per life gives the equivalent of 225,000 working lives lost.

workers' lifetimes, is approximated to be 24 million (or about 48,000 lives at a 60-year remaining life span).[4] In contrast, deaths directly due to COVID-19 so far are likely to have caused a loss of about 1.5 million of potential life years.[5] It is very difficult to project these losses forward, but a scenario in which total deaths in the United States would be triple what they were in the first nine months of the pandemic would imply a loss of 3.85 million potential life years.

Given the potential large number of workers affected, the effects of job loss can also have consequences for the aggregate labour market. Using estimates of the effect of job displacement on employment, the crisis could approximately lead to a reduction in the employment–population ratio between 0.6 and 1.5 percentage points. This would imply that 13–33 per cent, or roughly 25 per cent, of the reduction in the employment–population ratio between February and August 2020 could be long lasting. Incidentally, job loss during the Great Recession could explain a similar fraction of the persistent reduction in the employment–population ratio during the Great Recession.[6]

These projections are based on estimates for displaced workers – those who lose stable jobs with good employers – and thus may represent overestimates of the effect for all the unemployed, some of whom lost jobs in typically lower-paying service sectors. Yet, the risks are also substantial for low-income workers and for younger workers entering the labour market, who are typically more affected by higher unemployment in downturns.

Over six million individuals will graduate high school, obtain a college degree, or quit college prematurely to enter the labour force in the United States in 2020, and about 13 million workers aged 16–24 are currently in the labour force.[7] Hence, about 20 million young individuals are at particularly high risk of exposure to a recession. Existing evidence suggests that unlucky labour market entrants suffer losses in earnings that last 10–15 years, depending on the severity of the recession.[8] Focusing on entrants alone, the loss in earnings over 10 years is predicted to be about $320 billion. Yet, it appears their socio-economic status declines again in middle age, and several

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[4]Each of the 3.6 million unemployed can expect a life span shortened by 1.5 years, on average, giving 5.4 million total life years lost. Dividing this into 60-year increments (representing average life remaining) gives us 90,000 total lives lost.

[5]Mitra et al. (2020) estimate an average loss of seven potential life years per death due to COVID-19 from January to May 2020. By the end of September 2020, the Center for Disease Control had reported 201,000 deaths due to COVID-19 since January 2020, and deaths are projected to rise to 214,000 to 226,000 by mid-October 2020.

[6]Song and von Wachter, 2014.

[7]See Table 9. Another potential effect of the crisis with possibly long-term consequences not further discussed here is that enrolment for undergraduate education has fallen, while that for graduate degrees has increased (https://nscresearchcenter.org/stay-informed/).

[8]See, for example, Kahn (2010), Oreopoulos, von Wachter and Heisz (2012) and Schwandt and von Wachter (2019).

studies have found that they experience higher rates of death over the long term.[9] Depending on the estimate, labour market entrants could lose 6–10 million potential life years going forward. Here we only consider the adverse effects of job loss in the United States – the potential loss to workers and labour market entrants affected by displacement and career disruptions due to the COVID-19 crisis in labour markets worldwide could be substantially larger.

In light of these potential long-term costs, the remainder of the paper briefly reviews policy responses to the crisis, and points to several policy options going forward, focusing on proposals to expand the Short-Time Compensation (STC) programme. The two main policy responses addressing the plight of large-scale job loss in the United States have been an expansion in UI benefits and an extension of business loans. Two aspects are crucial for the success of these approaches. The first is the presumption that the economy will largely return to its previous state once the pandemic is contained. In this case, workers who have been temporarily laid off or furloughed will return to their previous jobs, and the economy will quickly recover. The second is that, in this process, workers' incomes are sufficiently sustained to avoid hardship. This has proven to be a particularly important point in this crisis, as a majority of job losses were concentrated among low-paid workers.

Instead of opting for massive layoffs, many other developed countries have opted to subsidise workers on their jobs through STC programmes (also known as work sharing or short-time work), including Canada, France, Germany and Italy.[10] The UK has instituted a temporary STC-like programme. STC programmes allow firms to reduce their payroll costs through a shared reduction in hours rather than concentrated layoffs, while the shortfall in workers' earnings is made partly up by payments from the UI system. In normal times, STC programmes require firms to keep some work ongoing, but nothing prevents an STC programme from accommodating a 100 per cent temporary work reduction in times of crisis. In contrast to the experience in the United States, several European STC programmes have served millions of workers (see Section IV).

There are several potential advantages of STC programmes over large-scale layoffs. By helping businesses to cover their payroll costs and keep workers attached to businesses while they are not working, STC programmes can effectively put the workforce on standby until the COVID-19 outbreak

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[9]See, for example, Cutler, Huang and Lleras-Muney (2016) and Schwandt and von Wachter (2020).

[10]See the discussion in Section IV. German employees on short-time work receive 60–67 per cent of their prior income, and Germany has increased firms' eligibility and waved firms' social security contributions. Italy has recently increased the coverage of its STC programme to include more industries, firms and workers, while temporarily exempting businesses from increasing payroll taxes. Canada has recently doubled the maximum duration of its STC programme to close to 1.5 years, and relaxed eligibility requirements (https://www.canada.ca/en/employment-social-development/corporate/notices/coronavirus.html).

is contained. Pandemics often happen in waves, so an appropriate policy response should provide employers with the flexibility to adapt to a 'wave-like' pattern – a feature STC programmes handle exceptionally well. By preserving employment relationships, STC programmes maintain knowledge and skills specific to certain employers, while avoiding the costs of a massive turnover of the workforce that could result from large-scale unemployment. While some reorganisation can be beneficial, it is likely much more effective and less damaging if it takes places gradually. Moreover, the latest research shows that long-term costs of job loss during recessions arise from a rise in unemployment durations and a reduction in job availability among high-wage employers. Hence, any adjustment occurring in a period when more and better jobs are available will limit the costs of job loss. Last but not least, STC programmes preserve employees' existing employer-tied health (and retirement) benefits, a crucial benefit in the context of a pandemic.

However, although the majority of US states have STC programmes as part of their UI programme, they have been underutilised during this crisis.[11] The Coronavirus Aid, Relief and Economic Security (CARES) Act made STC claims from existing state programmes 100 per cent federally financed. States have to pay for regular benefits from a trust fund replenished by payroll taxes, which makes STC substantially cheaper. The STC programme can also be used to rehire previously laid-off workers on a part-time basis. Participation in STC has historically been concentrated in several states, some of which had shares of STC among initial claims over 5 per cent during the Great Recession. The hurdles of extended STC use are well known, and include lack of awareness or knowledge of programme details, and slow and outdated administrative processes. The availability to pay workers' full salaries through a loan from the Payment Protection Programme may also have dissuaded employers from applying for STC.

Yet, if appropriately strengthened, STC could still be useful in the course of the ongoing recovery. As of August 2020, new initial UI claims and repeat UI claims were still substantial. By lowering further job destruction, STC can prevent additional job loss, thereby reducing crowding in the labour market and helping the unemployed find jobs.[12] It could also support firms in rehiring laid-off workers part-time, a particularly useful feature given the high rates of reported temporary layoff. In the aftermath of the Great Recession,

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[11]Currently, close to 30 states covering over 70 per cent of the US workforce have existing STC programmes that are integrated into their UI programmes. See https://oui.doleta.gov/unemploy/docs/stc_fact_sheet.pdf and https://s27147.pcdn.co/wp-content/uploads/Fact-Sheet-Work-Sharing.pdf.

[12]During and after the Great Recession, this argument was made forcefully by Kevin Hasset, among others (https://www.latimes.com/archives/la-xpm-2010-apr-05-la-oe-baker5-2010apr05-story.html and https://www.cbpp.org/sites/default/files/atoms/files/4-2-14fe-hassett.pdf)

the US Congress fully funded STC claims to help support the fledgling recovery.[13]

This paper lays out some key recommendations to strengthen US STC programmes and make these a more widespread tool during the recovery from the COVID-19 crisis. These changes would also improve STC for future downturns. In brief, the recommendations are:

- to institute fully federally funded, trigger-based STC benefits during recessions that do not increase participating firms' payroll taxes;
- to make participation in STC a requirement to obtain business emergency loans;
- to allow firms and their payroll processors to pay benefits to workers in times of recessions, and to reimburse firms through payroll tax credits;
- to require states to fully automate the processing of STC applications.

An alternative to such reforms would be to institutionalise a national STC programme.[14] In addition to reform proposals for STC, the paper discusses reform proposals for UI and partial UI, which may be a valuable option for workers whose employers do not sign up for STC.

The remainder of the paper discusses the impacts of the COVID-19 crisis on the labour market and on the number of workers vulnerable to experience long-term losses (Section II). Based on these numbers and existing estimates, Section III approximates the long-term costs of recessions for job losers and labour market entrants. Section IV gives a brief overview of the US experience with labour market policies during the crisis, contrasting it with that of other countries, and presents a series of reform proposals. Last but not least, in Section V, the paper concludes with a discussion and a proposal on how administrative data from the UI system can be used to monitor the economic effects of COVID-19 and the success of UI, STC and related programmes to aid workers in real time.

II. Impact of the COVID-19 crisis on the labour market

Estimating the total number of jobs lost and the total number of individuals laid off in recessions is a mainstay of official labour market statistics and a fundamental input to cyclical policy responses. In this context, understanding what fraction of job losers are likely to experience persistent effects is particularly important, as it directly speaks to the potential of hysteresis in the labour market and potential long-term effects of the recession on society and the economy. Hysteresis refers to the extent that a recession

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[13]In the period 2012–15, states were able to reimburse the full cost of STC payments (Middle Class Tax Relief and Job Creation Act of 2012).

[14]von Wachter and Wandner, 2020.

leads to a lasting rise in equilibrium unemployment (or a reduction in labour force participation), with important implications for the scope of policy. Yet, isolating the number of vulnerable job losers is a perhaps surprisingly difficult and understudied question.

1. Extent of job loss during the COVID-19 crisis

A job loss is typically defined as a situation when a worker leaves their employer because of economic conditions at the firm and through no fault of their own. Although seemingly straightforward, this concept has proven to be hard to implement in practice. It is clearly not captured by net employment changes, and many job losers do not end up counted as unemployed or do not file a claim for unemployment benefits. The definition also leaves ample space for ambiguity when measured in surveys.[15]

These common problems are compounded during the COVID-19 crisis for at least three reasons. Workers may have left their jobs voluntarily to avoid exposure to the virus or to care for sick family members. Hence, while they effectively lost their jobs due to the pandemic, technically they were not laid off because of economic conditions, and may be counted as neither unemployed nor laid off by official statistics. Another defining feature of the crisis has been that a large number of individuals reported to be on temporary layoff, and this has already led to measurement problems in the US unemployment rate.[16] The eligibility for UI was expanded to include workers who left their job due to COVID-19 and who are not actively searching for a job.[17] The widespread use of furloughs and temporary layoff makes the concept of layoffs also harder to answer in surveys.

Here we try to sidestep these questions by treating any job exit triggered by the pandemic as an involuntary interruption of work. Because the literature suggests even temporary interruptions of work can be costly, we refer to job exits during the COVID-19 crisis as job losses. As none of the measures captures the full extent of job loss, we rely on a range of measures to provide a sense of the order of magnitude of potentially costly job loss.

There are several statistics typically used to measure the amount of individuals who lost jobs during recessions. Discussing all of these in detail is beyond the scope of this paper, but common statistics include, among others:

[15]For example, workers might leave or be induced to leave a shrinking employer voluntarily or without being officially laid off. Similarly, the typically high amount of worker mobility in the United States, especially among workers who have held their job for less than a year or two, means many workers would have left a contracting firm anyway.

[16]See, for example, https://www.bls.gov/covid19/employment-situation-covid19-faq-july-2020.htm#ques8.

[17]In addition, as we discuss further below, the new Pandemic Unemployment Assistance (PUA) programme expanded UI coverage to self-employed individuals who would not have been captured in UI claims previously.

- the total change in employment and in non-farm payroll as measured by the Current Population Survey (CPS) and the Current Employment Statistics (CES), respectively;
- the total increase in the number of unemployed (CPS);
- the cumulated number of initial claims to UI;
- the number of workers laid off, as reported by employers in the Job Openings and Labour Turnover Survey (JOLTS);
- with greater lags, some household surveys also include questions on worker job loss.

It is well known that, taken on their own, none of these statistics provides a precise or comprehensive measure of job loss even in a 'regular' downturn. Nevertheless, viewed together, they give a sense of the overall magnitude of job losses.

Figure 1 shows the change in employment and unemployment with respect to February 2020, and Figure 2 plots the measures of the monthly new flows of layoffs. Table 1 shows the different measures of the total amount of job loss since March, the beginning of the COVID-19 crisis in the labour market.

FIGURE 1

Changes in monthly employment, unemployment, and continuing claims for UI relative to February (stocks)
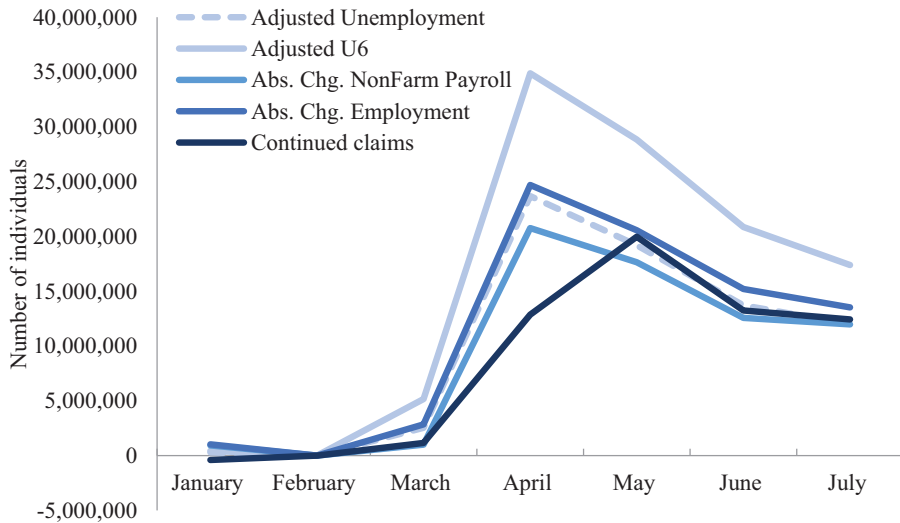
Source: Unemployment and unemployment plus marginally attached and involuntarily part-time (U6) from the CPS. Unemployment numbers are adjusted as described in Table 1. Non-farm payroll are from the CES. Continued claims from employment training administration.

FIGURE 2

Initial claims to unemployment insurance and layoffs (flows)
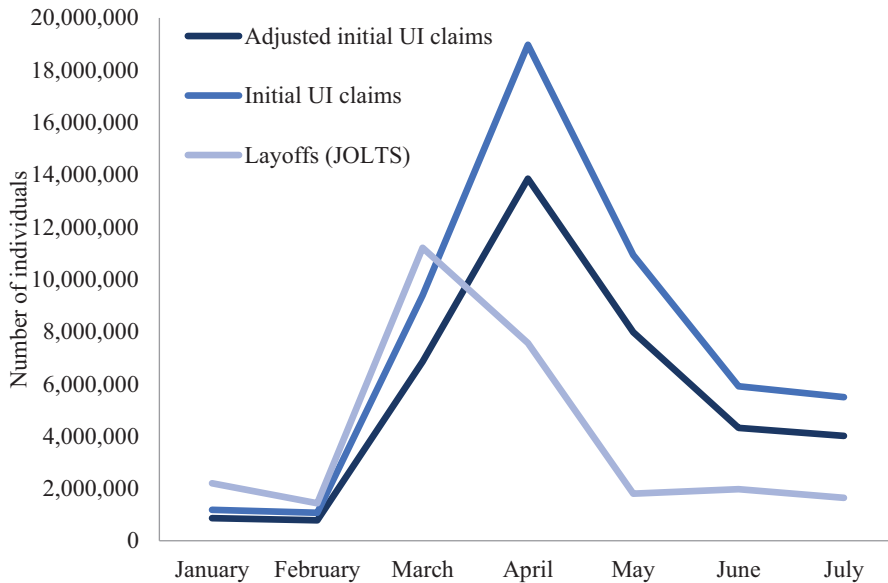
Source: Layoffs are from JOLTS, nonfarm payroll from the CES, and initial UI claims from the Employment Training Administration. Adjustment for duplicates is as described in Table 1.

Overall, the extent of job losses because of COVID-19 ranges from 25 million to approximately 40 million. This wide range is confirmed by supplementary data collected during the COVID-19 crisis by the CPS, underscoring the ambiguity during this crisis. In the following subsection, we discuss how many of these job losses are likely to be costly.

The classic measure of the number of jobs destroyed in a recession is the net change in employment. The employment reduction from February to April 2020, the lowest point during the crisis, was 25 million, according to the CPS. An advantage of this measure is its simplicity, but it conflates job losses with changes in voluntary mobility, hiring, and entry and exit from the labour force. Another often-used indicator is the rise in the number of workers who are unemployed. At its peak, the number of those officially counted as unemployed (without adjusting for classification errors) rose by 16 million. A broader measure that includes discouraged workers (U5) rose by 17 million; and when involuntarily part-time workers were included (U6), the increase was 23 million.[18]

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[18]This latter group would include individuals who were laid off and took part-time jobs to make ends meet, many of whom may suffer the longer-term consequences of job loss.

TABLE 1

Alternative measures of employment decline and layoffs during the COVID-19 crisis in the labour market

Data source	Statistic	Millions of workers	Job loss rate with respect to February labour force
	Change in stocks		
	Change from February to April (lowest point)		
CPS	Change in employment	25	0.15
CES	Change in nonfarm payroll	21	0.13
CPS	Change in unemployment	16	0.10
	Adjusted unemployment	24	
	Change in U5 (adjusted)	24	0.15
	Change in U6 (adjusted)	30	0.18
	Change from February to July (highest point)		
CPS	Change in employment	14	0.08
CES	Change in nonfarm payroll	12	0.07
CPS	Change in unemployment	11	0.06
	Adjusted unemployment	12	0.07
	Change in U5 (adjusted)	12	0.07
	Change in U6 (adjusted)	16	0.10
	Measures of job loss		
	Cumulated March through June		
JOLTS	Layoffs	23	0.14
ETA	Initial UI claims	46	0.28
	Unduplicated UI claims	35	0.21
	New initial UI claims	39	0.24
	Unduplicated new UI claims	36	0.22
	Cumulated March through July		
JOLTS	Layoffs	25	0.15
ETA	Initial UI claims	51	0.31
	Unduplicated UI claims	37	0.23
	New initial UI claims	43	0.26
	Unduplicated new UI claims	38	0.23

Note: The numbers of unemployed were adjusted for the potential misclassification of individuals employed but not at work; see, for example, https://www.bls.gov/covid19/employment-situation-covid19-faq-july-2020.htm#ques8. To unduplicate unemployment insurance claims, we apply a discount factor obtained from California micro records.

Source: CPS = Current Population Survey. CES = Current Employment Statistics. JOLTS = Job Opening and Labor Turnover Survey. ETA = Employment and Training Administration.

Unemployment is a partial measure of job loss because not all job losers go through a spell of non-employment. The official unemployment number is also particularly sensitive to the type of job search activity done by workers, and hence typically not all those working are counted as unemployed. In this crisis, all unemployment numbers had to be adjusted upwards because of potential undercounting of workers not searching but on temporary layoff. At the peak, with the adjustment, there was a total of 24 million unemployed in the United States, which rises to 30 million once discouraged and involuntary part-time workers are included (U6).[19] However, some of those involuntarily working part-time may in fact be furloughed in this crisis and might not actually have lost their jobs, underscoring the difficulty of counting job losers and unemployment during this crisis.

Another approach is to look directly at measures of the monthly flows of job losses. Perhaps the most discussed number is that of initial UI claims. By the end of July, there had been 51 million initial UI claims, about double the increase in job loss indicated by the reduction in employment, and triple the increase of the number of unemployed. The total initial claims number often reported includes new initial claims to regular UI (including PUA), additional UI claims among repeat job losers, and claims for work sharing programmes. If we consider only new initial claims as a better measure of the number of workers who lost their job at least once, there were 43 million new UI claims from March to July 2020.

A potential issue with initial UI claims is that some workers file multiple initial claims. In this crisis, this is partly mechanical as PUA claimants are often required to file for regular UI first in order to establish that they are not eligible for regular UI. While the number of duplicate initial claims for the United States is not known, recently the California Policy Lab calculated that 27 per cent of initial claims from 15 March to 25 July 2020 were duplicates, because of either additional claims or duplicate filings.[20] As federal data indicate additional claims are 15 per cent of total initial claims (see Table 1), to obtain a sense of non-duplicate new initial claims we can discount 43 million by 12 per cent (27 per cent – 15 per cent), to obtain 38 million.

The approximate 38 million unique new initial claims since the start of the crisis is a potential upper bound of job loss during the crisis, with two important caveats. On the one hand, it is well known that typically only a fraction of all those becoming unemployed file a UI claim, indicating that this number, albeit large, may actually understate the total effect of the crisis on job loss. On the other hand, in this crisis, new initial claims include PUA claims

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[19] See https://www.bls.gov/covid19/employment-situation-covid19-faq-july-2020.htm#ques8.

[20] In California, workers who file an initial PUA claim are not reported twice in the initial claim statistics. This does not appear to be the case for all states (Cajner et al., 2020). Hence, our factor may understate the degree of duplication in the national initial claims statistics.

by self-employed individuals, for whom the concept of job loss as traditionally defined may not make sense. Yet, presumably these individuals may still suffer from a work interruption and its potential long-term consequences, and hence it makes sense to keep them in the total.[21]

The only direct survey-based measure of layoffs available in close to real time is from the JOLTS, which collects information from employers. If we cumulate the number of layoffs from March to June, we obtain 23 million, quite similar to the initial reduction in employment. Yet, Figure 2 shows that the number of layoffs in the JOLTS drops off sharply in April, the month when all other series shown in Figures 1 and 2 have their peak during the crisis. A partial explanation could be that emergency business loans through the Payment Protection programme may have reduced reported layoffs from firms. This is consistent with some of UI claims being from workers quitting jobs because of potential exposure to COVID-19, but it could also be due to a change in reporting behaviour from firms.[22]

Overall, standard measures of employment changes during recessions indicate that job losses during the COVID-19 crisis have ranged from 25 million to 40 million, and more if we were to add counts of multiple job loss. New data from collected by the CPS during the COVID-19 crisis confirm this range. In May, 50 million individuals reported not being able to work at all or only able to work at reduced hours in the preceding four weeks because their employer closed or lost business due to COVID-19 (the number was 40 million in June and 31 million in July). Among those, 55 per cent, or 27 million, were employed at the time of the survey date, and 18 million (36 per cent) were unemployed or wanted a job, underscoring the inherent ambiguity of the concept of employment and job loss during this crisis.[23]

The Great Recession can serve as a useful point of comparison, yet the same difficulties in establishing total job losses arise. The net decline in employment in 2008 and 2009 was about 9 million. Data from the Displaced Worker Survey indicate job losses of 15.4 million for 2007–09.[24] In 2008 and 2009, there were approximately 32 million new initial UI claims. The JOLTS data showed there were close to 40 million layoffs in the 18 months from December 2007 to May 2009. Relative to the labour force in December 2007 (154 million), these numbers lead to a range in the job loss rate, with respect

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[21]If we were to compare initial UI claims per se to prior recessions, PUA claims would have to be excluded.

[22]The business loans through the Payment Protection programme are partly or wholly forgiven if firms refrain from layoffs and maintain the level of their pre-crisis payroll.

[23]The fraction of those reporting that they had been unable to work at some point in the last four weeks due to COVID-19, which is employed at the survey date, remained around 55 per cent in June and July. See https://www.bls.gov/covid19/employment-situation-covid19-faq-july-2020.htm#ques8.

[24]This refers to both short-tenured and higher-tenured workers. See https://www.bls.gov/news.release/archives/disp_08262010.htm.

to the labour force in December 2007, of 6 per cent, 10 per cent, 21 per cent and 26 per cent, respectively.[25]

The second column of Table 1 shows the implied job loss rate with respect to the February labour force in this crisis. While the initial drops in employment implied a job loss rate of about 13–15 per cent, the job loss from cumulated unduplicated new UI claims by end of July is closer to 23 per cent. Hence, the job loss rate in the COVID-19 crisis so far is on the same order of magnitude, if not larger, compared with the Great Recession. Yet, the losses during the pandemic are substantially more concentrated, occurring over a period of only five months.

Given the Great Recession led to a persistent rise in unemployment and reduction in labour force participation, this comparison does not bode well for the potential effect of the COVID-19 crisis on workers and the economy. In fact, recent projections suggest both long-term unemployment and permanent job loss may reach levels seen in the Great Recession.[26] How to measure the potential number of job losers at risk of loss of long-term earnings or unemployment is discussed in the following subsection.

2. How many job losers are at risk of long-term losses?

If assessing the total amount of job loss during the crisis is difficult, it is even harder to assess how many workers are at risk of long-term effects from job loss. Given statistics on temporary layoffs by the CPS and the incidence of expected recall from UI claimants, many job losers likely had ongoing attachment to employers. Thus, when assessing the potential long-term effects of the crisis, it is important to understand who is likely to suffer permanent or otherwise costly job loss.

One approach to address this question is to consider employment changes in July, the highest point of the crisis so far. Table 1 shows that the net reduction in employment since March was 12–14 million, about 55 per cent of the initial reduction. While some of these jobs are likely to be on temporary hold, four months into the crisis, it is fair to classify these as more lasting employment reductions. The order of magnitude would be consistent with a research study released in April that predicts that 42 per cent of job losses during the crisis are permanent.[27]

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[25]The percentages are obtained by dividing 9, 15.4, 32, and 40 million by 154 million, respectively. The rise in the number of unemployed fell in a similar range. The rise in the number of unemployed (U3) from December 2007 to the peak in January 2010 was 8.8 million. The broader measure that includes discouraged workers (U6) rose by 14.5 million during the same period. For the labour force in December 2007, see Table C in the corresponding Employment Report by the US Department of Labour (https://www.bls.gov/news.release/archives/empsit_01042008.pdf).

[26]Chodorow-Reich and Coglianese, 2020.

[27]Barrero, Bloom and Davis, 2020.

An alternative approach is to consider the incidence of job loss during the crisis for workers most vulnerable to experiencing long-term costs. For example, studies of the long-term costs of job displacement have focused on stable workers from mid-sized to larger firms, in order to obtain a robust measure of the long-term cost.[28] These workers will probably have not looked for another job recently and they are also at higher risk of persistent losses because large firms typically pay more and their wages rise with tenure. While there are likely to be many more individuals laid off during a recession who are at risk of longer-term effects, so far estimates of the full distribution of long-term unemployment or earnings losses for all job losers has proven to be difficult to estimate.

A pragmatic solution would be to follow the literature and use employer size and job tenure to attempt to gauge the number of workers at risk of long-term effects of job loss. This would also have the advantage that these are the workers for whom we have estimates of the long-term costs of job loss. Unfortunately, there are currently no available data that would allow us to measure job tenure and employer characteristics of all job losers. Here, we circumvent this problem by focusing on UI claimants, for which such data are, in principle, available.

Based on the literature, Table 2 presents possible measures of the number of workers who might be at particular risk of experiencing long-term costs of job loss. We take the cumulated number of unduplicated UI claims from Table 1, and sequentially impose two key criteria from the literature of job displacement: (a) that the claimant's main employer prior to job loss had at least 50 employees, and (b) that the claimant had at least two years or at least six years of job tenure. These latter two cut-offs are chosen because they correspond to categories available in the UI data in California, and because they roughly correspond to the main tenure categories used in the literature. As tenure and firm size data are not available in national UI-related publications, we obtained the fraction of UI claimants by gender, firm size, job tenure and age from the California data, and multiplied the national number by these fractions. These fractions are shown in Table 3.

The results shown in Table 2 confirm that limiting UI claims to higher-tenured workers from mid-sized to larger firms reduces the amount of job losers substantially. Yet, given the staggering scale of job losses during this crisis, the number of job losers who, by these criteria, are deemed at high risk of long-term costs of job loss is substantial. For example, there were

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[28]The literature typically defines a job displacement as a separation from the employer when the firm experiences a mass-layoffs, often defined as a 30 per cent reduction in employment or more. To obtain a precise measure of mass-layoff, the literature often focuses on firms with at least 50 workers at baseline. Since job mobility falls rapidly with job tenure, a minimal amount of tenure is imposed to exclude voluntary movers from the potential pool of job losers.

TABLE 2

Measures of potentially costly layoffs during the COVID-19 crisis in the labour market

	All workers	Men	Women
		(millions of workers)	
Unduplicated initial unemployment insurance claims (March to July)			
All employers			
Total	37.1	17.8	19.3
With tenure 2 years or more	27.0	12.8	14.2
With tenure 6 years or more	11.0	5.0	6.0
Employer size 50+			
Total	20.6	9.9	10.7
With tenure 2 years or more	15.6	7.4	8.2
With tenure 6 years or more	6.5	3.0	3.6
Long-term unemployment in July			
Total unemployed	16	8	9
Fraction duration 15 or more weeks	0.49	0.46	0.47
Total duration 15 or more weeks	7.9	3.9	4.0

Note: To obtain the number of initial UI claims for each category, we multiply the shares of UI claims in these groups in California in Table 3 with the unduplicated US total in Table 1. Long-term unemployment numbers are from the CPS.

approximately 16 million new UI claimants estimated to have two years of job tenure from employers with at least 50 employees. In the next section, we will see that these workers have been shown to suffer substantial long-term costs of job loss during past recessions.

As a point of comparison, for the Great Recession, Farber (2011) calculated a job loss rate among higher-tenured workers (with at least three years of tenure) of 16 per cent based on the Displaced Worker Survey, a supplement to the CPS. In contrast, the number of new UI claims with two or more years of tenure was 27 million, about 16.4 per cent of a labour force of 164.6 million in February 2020. Again, while the concentrated nature of the shock due to the pandemic has been staggering, the order of magnitude of job losses, at least by these measures, would seem similar.

A crucial caveat is, of course, that typically not all job losers file UI claims, potentially suggesting that the actual rate of job loss is potentially higher. However, compared with our other statistics, new UI claims are at the upper bound, so we treat it as such. Estimates of the application rate to UI vary widely, with some numbers fairly close to one.

The number of very high-tenured UI claimants from mid-sized to larger firms is smaller, about 6.5 million. Another measure sometimes used to indicate costly job loss is the number of individuals with longer unemployment

TABLE 3

Distribution of initial UI claims during the COVID-19 crisis in California by job tenure and firm size prior to job loss, separately by gender and age

	All claims	Percentage of claims from the age × gender group				
		2+ years tenure	6+ years tenure	Prior employer; 50+ employees	2+ years tenure; prior employer; 50+ employees	6+ years tenure; prior employer; 50+ employees
Panel A: men						
All ages	3,441,380.0	66.3	25.7	51.4	38.4	15.5
Aged 30–34	11.9	8.7	2.9	6.9	5.2	1.9
Aged 35–39	9.7	7.2	2.8	5.3	4.1	1.7
Aged 40–44	7.8	5.9	2.5	4.1	3.3	1.5
Aged 45–49	7.4	5.6	2.6	3.8	3.0	1.5
Aged 50–54	7.5	5.8	2.9	3.8	3.1	1.7
Aged 55–59	7.2	5.6	2.9	3.6	3.0	1.7
Aged 30–59	51.5	38.8	16.6	27.5	21.7	10.0
Panel B: women						
All ages	3,745,561.0	73.6	31.3	55.2	42.2	18.4
Aged 30–34	12.4	9.3	3.5	6.9	5.4	2.1
Aged 35–39	10.1	7.6	3.3	5.3	4.2	1.9
Aged 40–44	8.5	6.4	3.0	4.4	3.5	1.7
Aged 45–49	8.3	6.3	3.2	4.1	3.3	1.8
Aged 50–54	8.1	6.3	3.3	4.0	3.3	1.9
Aged 55–59	7.6	6.0	3.3	3.8	3.1	1.9
Aged 30–59	55.0	41.9	19.7	28.5	22.9	11.4

Source: Tabulations from California initial unemployment insurance claims by the California Policy Lab.

spells. In July 2020, 50 per cent of all unemployed, or 7.9 million workers, had unemployment spells of 15 weeks or more. This is a concerning number, and it appears that the incidence of longer unemployment spells is on the rise. However, these one-digit numbers likely understate the potential number of individuals who lost their job during the COVID-19 crisis and might be susceptible to long-term costs. Many individuals return to jobs at lower wages to avoid the immediate hardships of long-term unemployment, and come away with lower earnings potentially lasting decades.

III. Long-term costs for job losers and labour market entrants

A recession can have long-term effects lasting beyond the downturn itself, especially for directly affected workers. This section summarises some of what we have learned about the long-term effects of job loss and unemployment for affected workers. The focus is on individuals of working age in the labour market (i.e. job losers and labour market entrants) and on economic outcomes. Yet, we also summarise the effects of other outcomes, chiefly on mortality and health.

1. Long-term effects for job losers

The prospective of a deep and possibly prolonged economic shock for potentially affected workers and labour market entrants is dire. Existing estimates suggest that losing a stable job at a good firm during a recession can lead to long-lasting reductions in employment and earnings. For example, analysing job losers from several recessions in the United States, Davis and von Wachter (2011) find that such a job displacement leads to a cumulated loss of 2.5 years' worth of workers' average annual earnings before job loss. In a separate analysis of several recessions, Song and von Wachter (2014) focus on employment reductions and report a total loss of 1.5 years, worked over their remaining lifespan, after a job displacement in recessions.

These losses may be lower for workers who come from smaller, lower-paying employers or who just recently started their jobs. Yet, available evidence suggests that job loss during recessions has detrimental effects on earnings for broad groups of workers. Workers of all ages, from all industries, throughout the wage distribution experience large, persistent losses from job loss during a recession. Similarly, the findings are robust to considering job losses from smaller firms or workers with at two or more years of job tenure.[29] For similarly defined job displacement events, treatment and control

[29]von Wachter, Song and Manchester, 2011.

estimates for other countries have also found large and persistent earnings or employment losses.[30]

What implications do these findings have in the current economic environment? This is, of course, a difficult question, because the nature of the COVID-19 crisis is different from previous recessions in various respects. Many of the workers losing their jobs come from service sectors typically insulated from large cyclical swings, such as restaurants, personal services or retail, and they tended to be younger, lower-educated, and more likely to be female. Moreover, many workers report that they are on temporary layoff or expect to be recalled, raising the hopes for a speedy return to employment once the COVID-19 pandemic is under control.

At the same time, most forecasts predict a prolonged economic recovery lasting well into 2021, and history suggests that the labour market recovers more slowly than GDP. Given the extraordinary amount of job loss, it is fair to assume that the labour market might be slack for some time to come – raising the spectre of further increasing long-term unemployment and a rise in permanent job loss, and with it the likelihood that a substantial share of job losses will have long-lasting consequences for workers.

Hence, it is important to assess the total economic losses to workers who have been laid off during the COVID-19 crisis. To gauge the potential orders of magnitudes of the long-term effects of job losses during the COVID-19 crisis, here we consider the extent of job losses that have occurred so far. Because the recovery is predicted to last several years, there are likely to be additional, potentially costly, layoffs going forward. Hence, from this point of view, these approximate potential costs can be viewed as lower bounds.

In Table 4, we use estimates of the effect of job loss on lifetime earnings, lifetime employment and mortality to gauge the potential orders of magnitudes of the potential long-term costs of job loss during the COVID-19 crisis. The table takes estimates from the existing literature of a worker's long-term costs of a job displacement, and applies them to the range of estimates of the amount of job loss and costly job loss from Tables 1 and 2.

a) Earnings

Consider first the potential losses in long-term earnings. A classic measure of the cost of job loss is earnings, both because these are commonly available in large longitudinal data sets and because they represent most individuals' chief source of income. According to Table 4, potential long-term losses range from $5 trillion at the upper end (if all unique new UI claimants were to experience long-term costs), to about $2 trillion for the increase in broad unemployment

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[30]See, for example, Eliason and Storrie (2006), Morisette et al. (2007), Upward and Wright (2019) and Schmieder, von Wachter and Heining (2020).

TABLE 4

Approximations of the total long-term losses in earnings, employment, and life years due to job loss during the COVID-19 crisis for different groups of workers

	Millions of workers	Total loss in PDV of annual earnings (billion USD)	Total loss in employment years (millions)	Total loss in life years (millions)
Cumulated unique UI claims (approx.)	37	$4,899	−55	−57
Cumulated layoffs (JOLTS)	23	$3,045	−34	−35
Change in adjusted U6 March to July	16	$2,118	−24	−24
Long-term unemployed in July	8	$1,059	−12	−12
UI claims, employer size at least 50	21	$2,730	−31	−32
UI claims, tenure years 2 years or more	27	$3,580	−40	−41
UI claims, tenure years 6 years or more	11	$1,458	−16	−17
UI claims, tenure years 2+, employer size 50+	16	$2,064	−23	−24
UI claims, tenure years 6+, employer size 50+	7	$972	−11	−10
Average worker's loss at job displacement		$132,393	−1.48	−1.53

Note: Average worker's loss in present discounted value (PDV) of annual earnings in last row is mean of estimates for male and female workers with at least three years of tenure in Davis and von Wachter (2011), expressed in 2019 prices. Average worker's loss in years of employment in last row is estimate for male workers with at least three years of tenure in Song and von Wachter (2014). These estimates are used in all rows but for the last, where estimates for workers with at least six years of tenure in Song and von Wachter (2014) are used. Average worker's loss in life years in last row is estimate for male workers with at least three years of tenure in Sullivan and von Wachter (2009).

by July (about the same as the net loss of jobs in July), to about $1 trillion for those unemployed for at least 15 weeks in July.

The bottom half of Table 4 shows how these magnitudes change as we impose more restrictive conditions to isolate workers vulnerable to long-term shocks. As our preferred group, those UI claimants who had at least two years of job tenure at mid-sized to larger firms would be projected to lose a combined $2 trillion in lifetime earnings. This is a particularly relevant group because the estimates of long-term costs are based on workers who had at least three consecutive years of positive earnings from their employer, which covers workers who had at least two years of tenure.

These numbers are not of trivial magnitude. For example, the total spending of the three relief packages passed by Congress was estimated to amount to $1.8–2.2 trillion. Hence, these funds would be barely enough to cover the potential lifetime losses of one group of affected workers. However, less than half of those funds went directly to workers. Moreover, it is likely that other groups may also experience persistent costs, though these are harder to measure with precision.

b) Employment

Table 4 also shows the amount of potential cumulated lifetime losses in employment due to a job loss. Focusing again on new UI claimants with at least two years of tenure coming from firms with at least 50 employees, previous estimates imply a loss of about 1.5 years in employment, leading to a loss of 23 million work years over the workers' remaining lifetimes. This would be the equivalent of about a loss of 500,000 working lives (at 45 years per working life). Employment is a conservative estimate of the cost of job loss, as it ignores earnings reductions once workers are re-employed.

The total losses in employment are of interest in their own right, as persistent employment reductions can depress labour force participation and can have important implications for monetary policy. This phenomenon is also often referred to as hysteresis. To assess the degree of potential persistence of employment rates using evidence from displaced workers, Song and von Wachter (2014) consider the following simple hypothetical decomposition of the employment–population ratio (EPOP),

$$EPOP_t = EPOP_t^{ND} + \delta^D \pi^D,$$

into the EPOP ratio of workers who were not displaced ($EPOP_t^{ND}$); and the fraction of displaced workers in the working-age population (π^D) multiplied by the reduction in the employment rate due to job displacement (δ^D). The reduction in the employment rate is kept constant over time for simplicity.

Table 5 uses this equation to project the potential effect of costly job loss during the COVID-19 crisis on the EPOP ratio and compares it with the

TABLE 5

Implied reduction in the EPOP ratio due to potential long-term reduction in employment from costly job loss

	Amount of job loss in millions	Job loss rate with respect to working-age population	Implied reduction in EPOP ratio	Reduction relative to baseline EPOP ratio	Reduction as percent of total reduction in EPOP ratio
COVID-19 crisis					
Working-age population 16+					
EPOP in Feb 2020 = 0.61; drop in EPOP to Aug 2020 = 0.046					
Vulnerable UI claimants (Table 2)	16	0.06	0.006	0.010	13%
Peak rise in unemployment (Table 1)	24	0.09	0.009	0.015	20%
All new initial claims (Table 1)	38	0.15	0.015	0.024	32%
Working-age population 16–64					
EPOP in Feb 2020 = 0.73; drop in EPOP to Aug 2020 = 0.047					
Vulnerable UI claimants (Table 2)	16	0.08	0.008	0.011	17%
Peak rise in unemployment (Table 1)	24	0.12	0.012	0.016	25%
All new initial claims (Table 1)	38	0.18	0.018	0.025	39%
Great Recession					
Working-age population 16+					
EPOP in Dec 2007 = 0.63; drop in EPOP to July 2011 = 0.041					
Displaced Worker Survey	15	0.07	0.007	0.010	16%
Initial UI Claims	32	0.14	0.014	0.022	33%
JOLTS	40	0.17	0.017	0.027	42%
Working-age population 16–64					
EPOP in Dec 2007 = 0.72; drop in EPOP to July 2011 = 0.047					
Displaced Worker Survey	15	0.08	0.008	0.011	17%
Initial UI Claims	32	0.16	0.016	0.023	35%
JOLTS	40	0.20	0.020	0.028	43%

Note: Vulnerable UI claimants are those with at least two years of job tenure from firms with at least 50 employees (Table 2). The lowest point of the employment–population (EPOP) ratio after the Great Recession was in mid-2011. Employment and population data by age from the Bureau of Labor Statistics.

TABLE 6

Approximate total long-term costs in terms of lost earnings due to job loss during the COVID-19 crisis by gender, age group, tenure for workers displaced from mid-sized to larger employers, US and California labour markets

	PDV of earnings lost 3+ years tenure displaced in recession	US labour market 2+ years tenure		California labour market 2+ years tenure	
		Total claimants	Total earnings losses (in billion USD)	Total claimants	Total earnings losses (in billion USD)
Women, aged 21–50	$102,117	5,906,050	$603	1,144,129	$117
Men, aged 21–50	$162,669	5,330,394	$867	1,032,612	$168
Men, aged 21–30	$174,182	2,299,352	$401	445,434	$78
Men, aged 31–40	$139,309	1,810,976	$252	350,825	$49
Men, aged 41–50	$172,984	1,220,066	$211	236,353	$41
Men, aged 51–60	$160,711	1,169,602	$188	226,577	$36

Source: Estimates of present discounted value (PDV) of lost annual earnings from Tables 1 and 2 of Davis and von Wachter (2011), expressed in 2019 prices (the inflation adjustment from 2000 to 2019 is 1.48). To obtain the US numbers of initial UI claims for each category, we multiply the shares of UI claims in these groups in California in Table 3 with the unduplicated US total in Table 1. The comparable statistics for men aged 21–50 with 6 years of job tenure are 1,848,963 (358,184) number of claimants and $405 ($78) billion total earnings losses in the US labour market (California), based on a PDV earnings loss of $220,322.

Great Recession. Song and von Wachter (2014) report an estimate for δ^D of 10 percentage points. The working-age population (age 16 and older) in the United States in February 2020 was 260 million. Using 16 million as a preferred measure of the number of workers experiencing potentially costly job loss (Table 2), we obtain a job loss rate with respect to the working-age population of $\pi^D = 6.2$ percentage points. Hence, the long-run EPOP rate would be expected to decline by 0.62 percentage points due to the COVID-19 crisis. If we take the rise in adjusted unemployment at the peak (i.e. 24 million), we obtain $\pi^D = 9.2$ percentage points. If we take the unduplicated cumulated total new UI claims as an upper bound, we obtain $\pi^D = 14.6$ percentage points. The reduction in the EPOP rate thus ranges from about 0.6 to 1.5 percentage points, or about 1 per cent to 2.4 per cent relative to February's level (0.61).

If we instead take the working-age population to be aged 16–64 – at 206 million in February 2020 – Table 5 shows that we obtain a range of job loss rates π^D from about 8 to 18 percentage points, with corresponding changes in the EPOP rate of 0.8–1.8 percentage points due to permanent employment reduction from job loss of 10 per cent. This entails a 1.1–2.6 per cent reduction relative to the corresponding EPOP rate in February (0.73). It is worth noting that the total amount of jobs lost will likely be larger by the time the economy has returned to normal.

In contrast, the comparable total job loss rate with respect to the working-age population in the Great Recession was 7–15 per cent (aged 16 and older) or 8–18 per cent (aged 16–64).[31] Taking the mid-point of these two intervals (11 and 13 per cent, respectively), leads to a potential reduction of the EPOP rates of 1.1–1.3 percentage points. These changes are a similar order of magnitude, albeit somewhat smaller, than those potentially implied by job loss during the COVID-19 crisis.

How large are these reductions relative to the cyclical swings in the EPOP rate? From February to August 2020, the EPOP rate for workers aged 16 and older declined by 4.6 percentage points. Hence, the last column in Table 5 indicates that costly job loss would be predicted to explain about 13–32 per cent, or roughly a quarter of the reduction in the EPOP rate during the crisis at the mid-point of the predicted range. Similarly, for workers aged 16 and older, the reduction in the EPOP rate during the Great Recession from December 2007 to its lowest point in July 2011 was 4.5 percentage points. Hence, job loss would be predicted to have accounted for roughly a quarter of the entire decline during the Great Recession.

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[31]Divide 40 million layoffs occurring over 18 months of the Great Recession from JOLTS and 15.4 million occurring during the period 2007–09 in the Displaced Worker Survey, and divide by either 233 million (population aged 16 and above) or 196 million (population aged 16–64).

c) Mortality

The final column of Table 4 shows implied potential losses of mortality due to job loss during the COVID-19 crisis. The literature has shown that job displacement can have a range of adverse consequences, including marital instability and adverse consequences for physical and mental health. Mortality can be viewed as a particularly stark outcome, capturing the bottom line of the range of adverse effects of job displacement on a worker's life. Even in the unlikely event that a worker may have willingly sacrificed their health for higher earnings and consumption, widespread effects of job loss on mortality during the crisis would still be a key concern to society as a whole.

For our preferred group of job losers with at least two years of tenure coming from firms with at least 50 employees, previous estimates from Sullivan and von Wachter (2009) from the early 1980s recession suggest that a displacement can lead to a loss of 1.5 life years, if the mortality gap is sustained past their 20-year observation window. For this group of workers, Table 4 shows an implied potential total loss of 24 million life years. Assuming a remaining life expectancy of 50 years for a worker aged 30,[32] this would imply a loss of 480,000 remaining lives.

How do these reductions compare with potential life years lost due to COVID-19 so far? This is difficult to calculate, as it depends on the age distribution of those dying from COVID-19 and assumptions on life expectancy (setting aside potential reduction in life years of survivors). Under the assumption of an average life expectancy of 80, Mitra et al. (2020) calculate that by 28 May 2020, mortality due to COVID-19 in the United States had led to the loss of about 570,000 potential life years for 81,372 deceased individuals (Table 3).

At the end of September 2020, the Centers for Disease Control and Prevention (CDC) confirmed 201,000 deaths due to COVID-19 in the United States. The most recent predictions published online by the CDC put the total number of fatalities due to COVID-19 in the United States at 214,000–226,000 by mid-October 2020.[33] Using the upper bound estimates of Mitra et al. (2020), the upper bound may lead to a loss of 1.5–1.6 million potential life years (potentially more, because the age structure of new cases and, to a lesser degree, mortality have shifted towards younger workers.[34]

It is even harder to make guesses about total losses in potential life years lost due to COVID-19. Among the very few forecasts projecting as far out, the Institute for Health Metrics and Evaluation (IHME) predicts total deaths due to COVID-19 could reach 400,000 by 1 January 2021. This scenario would involve a doubling of the total number of deaths during the first nine months of

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[32] See https://www.ssa.gov/oact/STATS/table4c6.html#fn2.
[33] See https://www.cdc.gov/coronavirus/2019-ncov/covid-data/forecasting-us.html.
[34] See https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm.

the crisis. Based on the upper bound of Mitra et al. (2020), this would suggest a loss in potential life years reaching 3 million.[35] Accounting for uncertainty in the prediction of the IHME forecast, the upper limit is 550,000 deaths, almost a tripling of deaths during the first nine months. This extreme scenario would imply 3.86 million excess deaths due to COVID-19.

It is clear that only in the case of a substantial rise in the number of deaths related to COVID-19, and a further shift in mortality towards working-age individuals, would the losses in life years due directly to COVID-19 come close to the loss in potential life years predicted due to the rise in potentially costly job loss. For example, even if only half of those currently long-term unemployed experienced a reduction in long-term mortality, the total loss in life years would still be of the order of 6 million.

Of course, it is important to bear in mind that the mortality effects used here are likely to be an upper bound, as they occurred for workers in Pennsylvania during the early 1980s recession. Sullivan and von Wachter (2019) report that the effect of job loss on mortality is proportional to (and may partly be explained by) the effect of job loss on earnings. While the losses of earnings for displaced workers in the early 1980s in Pennsylvania were substantial, large and persistent earnings losses due to job loss have been found in each of the four US recessions prior to the pandemic. Hence, in so far as earnings losses put workers at risk of increases in mortality, mortality increases should be expected in the aftermath of the COVID-19 pandemic in so far as the economic outcomes of workers are affected. Moreover, given the large number of workers potentially affected, even if the mortality effect were, say, only a third of what is shown in Table 7, and only half of the long-term unemployed were affected, it would still be a loss in potential life years of about 2 million – double what has been approximately experienced due to COVID-19 so far.

These losses in mortality would occur gradually over the next 20–30 years and longer. The exact magnitude of mortality effects will likely be affected by the nature of the economic downturn and the type of industries and workers affected. Sullivan and von Wachter (2009) present evidence that the long-term mortality loss is proportional to the initial earnings loss – such that factors affecting the strength of the recession and the size of earnings losses would also be indicative of the long-term mortality effect. An important related aspect we do not integrate into the analysis is potential differences in mortality related to COVID-19 for less advantaged populations, which may also be more strongly affected by economic shocks. A consideration of the incidence of the long-term effects of economic shocks during the COVID-19 crisis on the labour market is an important avenue for future work.

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[35] See https://covid19.healthdata.org/united-states-of-america?view=total-deaths&tab=trend.

TABLE 7

Approximate total long-term costs in terms of lost employment due to job loss during the COVID-19 crisis by job tenure for workers displaced from mid-sized to larger employers, for US and California labour markets

Men aged 21–50	Cumulated years of employment lost compared to control group	US labour market		California labour market	
		Total claimants	Total employment years lost	Total claimants	Total employment years lost
3 or more years of job tenure	−1.48	5,330,394	7,888,983	1,032,612	1,528,266
6 or more years of job tenure	−1.72	1,848,963	3,180,217	358,184	616,076

Source: Table 3 of Song and von Wachter (2014). To obtain the US numbers of initial UI claims for each category, we multiply the shares of UI claims in these groups in California in Table 3 with the unduplicated US total in Table 1.

2. Long-term effects for labour market entrants

Besides job losers, labour market entrants are another group of workers particularly affected in recessions. These are particularly vulnerable both because they are looking for a job and because they are 'newly minted' in terms of work experience, such that labour market conditions may affect their career trajectories. The existing research from the United States and from a range of other countries shows that individuals who are unlucky to enter the labour market in recessions experience a large initial reduction in earnings and employment.[36] In contrast to job losers, most research shows that, on average, earnings effects dissipate for labour market entrants within 10 years, or 15 years after large downturns. Yet, some work indicates that these unlucky cohorts see a worsening of socio-economic outcomes again in middle age – both in terms of earnings, but also in terms of marital status and completed fertility, among others, discussed further below.

Based on estimates from Schwandt and von Wachter (2019) for the effects of a large recession (which they define as an increase in unemployment of 5 percentage points, such as in the early 1982 and 2008 recessions), von Wachter (2020) shows that those with less than a college degree (with a college degree) are predicted to lose 13 per cent (5 per cent) of the total present value of their earnings during their first 10 years in the job market. In terms of percentage losses of total discounted earnings, these estimates are in the same ballpark as those for job losers, but the implied average loss in cumulated earnings years is smaller. This is partly because direct employment losses are smaller (some new graduates are still able to find work), and partly because earnings among young workers are lower – such that there are fewer total earnings years lost.

By June 2020, about 6.8 million of young labour market entrants were likely to be looking for a full-time job for the first time. Breaking this down by education levels, 2.8 million college graduates were looking for jobs.[37] There are about 3.6 million individuals graduating from high school this year, of whom approximately 1.3 million will enter the job market immediately (see notes to Table 9). In addition, based on past experience, we estimate that about 500,000 high school dropouts and about 2 million individuals with some college education (including college dropouts) will enter the labour market.

The existing evidence shows that the effects are largest if a recession occurs in the year of graduation, but we know young job seekers, and young workers more generally, are at very high risk of unemployment and other adverse effects. In addition, data from the Bureau of Labour Statistics indicate that

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[36]See von Wachter (2020) for a recent summary of the literature on the persistent career effects of entering the labour market in a recession.

[37]The numbers are: 989,000 Associate's degrees, 842,000 Bachelor's degrees, 820,000 Master's degrees and 184,000 Doctor's degrees. See the National Center for Education Statistics, https://nces.ed.gov/programs/digest/d18/tables/dt18_318.10.asp?referrer=report; see also notes to Table 9.

TABLE 8

Approximate total long-term costs in terms of lost life years due to job losses during the COVID-19 crisis by age group and tenure for workers displaced from mid-sized to larger employers, for the US and California labour markets

	Life years lost		Total life years lost for workers with:			
	3+ years tenure	*6+ years tenure*	*2+ years tenure*	*6+ years tenure*	*2+ years tenure*	*6+ years tenure*
			US labour market		California labour market	
All ages	−1.53	−1.45	23,846,985	9,516,820	2,203,211	842,212
Aged 30–34	−1.59	−1.59	3,257,898	1,234,210	311,217	111,863
Aged 35–39	−1.57	−1.56	2,533,708	1,111,173	243,493	101,356
Aged 40–44	−1.56	−1.51	2,043,977	951,498	191,523	85,822
Aged 45–49	−1.53	−1.41	1,884,139	905,510	173,780	80,773
Aged 50–54	−1.50	−1.36	1,860,676	939,398	173,861	85,385
Aged 55–59	−1.43	−1.29	1,684,378	892,731	158,258	80,253
Aged 30–59			13,264,777	6,034,520	1,252,132	545,453

Source: Table 5 of Sullivan and von Wachter (2009). To obtain the US numbers of initial UI claims for each category, we multiply the shares of UI claims in these groups in California given in Table 3 with the unduplicated US total from Table 1.

there were approximately 13 million individuals aged 18–24 in the labour force in 2018. Adding these numbers implies approximately 20 million young workers will be at high risk of adverse effects from the recession. Thus, if the economic crisis resulting from the COVID-19 pandemic lasts well into 2021, a large number of young individuals will be subject to protracted earnings losses, increases in poverty and, later in life, lower socio-economic status and increases in mortality.[38]

Figure 3 and Table 9 present estimates of the potential long-term costs of entering the labour market during the COVID-19 crisis. In total, existing estimates would predict unlucky labour market entrants could lose about $320 billion over the first 10 years of their careers. This estimate is likely to be an understatement, as past evidence suggests stronger recessions lead to longer recovery periods; hence, it may take more than 10 years to overcome a shock of the order of magnitude of the COVID-19 crisis. Of course, if the labour market recovers quickly after the availability of a vaccine, say, then young workers could fare better than in past recessions.

It is worth noting here that past evidence suggests it is state of the labour market in the very first year or two that matters for young labour market entrants.[39] Hence, for avoiding longer-term career effects for labour market entrants, a strong recovery during 2021 would be crucial.

[38]A survey of this literature is available in von Wachter (2020).
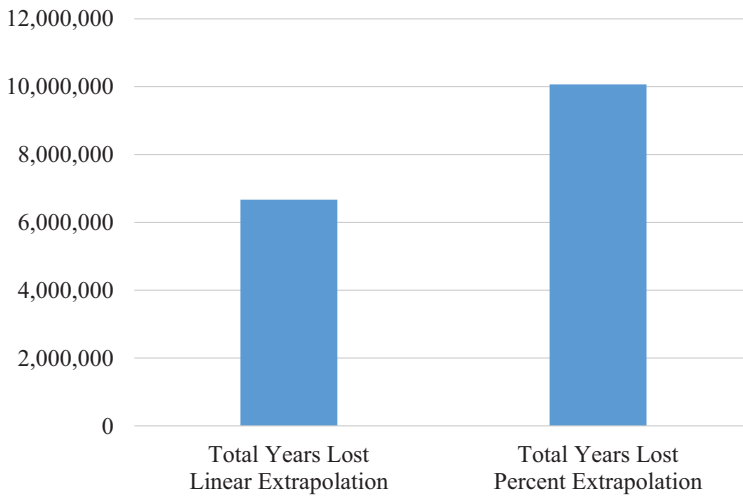[39]See, for example, Oreopoulos, von Wachter and Heisz (2012).

FIGURE 3

Approximate long-term losses in earnings and life years for unlucky labour market entrants during the COVID-19 crisis due to an increase in the unemployment rate at labour market entry in the state of entry by 10 percentage points

Panel A: total losses in present discounted value of annual earnings in first 10 career years
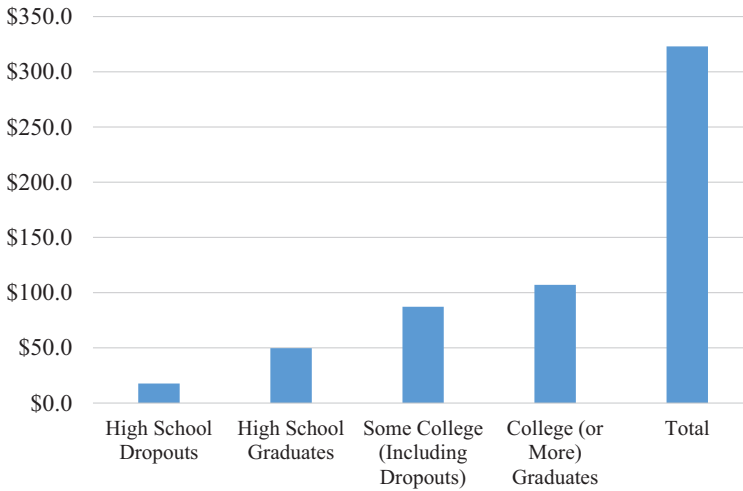
Panel B: total life years lost

Note: Estimated number of labour market entrants during the COVID-19 crisis (see Table 9): high school dropouts, 523,000; high school graduates, 1,300,000; some college (including dropouts), 2,122,566; college (or more) graduates, 2,835,000.
Source: Estimates for Panel A in 2019 prices from von Wachter (2020), based on Schwandt and von Wachter (2019). Estimates for Panel B from Schwandt and von Wachter (2020).

TABLE 9

Approximate long-term losses in earnings for unlucky labour market entrants by education group during the COVID-19 crisis

Education group	(1) Labour market entrants	(2) Excess deaths due to the COVID-19 crisis	(3) Per-person loss in annual PDV of earnings due to a large recession	(4) Combined PDV of earnings losses due to the COVID-19 crisis ($billion)
High school dropouts	523,000	98	$21,102	$18
High school graduates	1,300,000	243	$23,861	$50
Some college (including dropouts)	2,122,566	397	$25,667	$87
College (or more) graduates	2,835,000	530	$23,588	$107
All Entrants	6,780,566	1,268	$29,778	$323

Note: Estimates of present-discounted value (PDV) loss in annual earnings in 2019 prices from Table 1 of von Wachter (2020), based on estimates from Schwandt and von Wachter (2019). Excess deaths are calculated based on results in Schwandt and von Wachter (2020) using a rise in the unemployment rate of 8 points (from 3.5 per cent in February to a rate adjusted for misclassification of 11.3 per cent in July 2020). Large recession in column 3 refers to a rise in the unemployment rate by 5 percentage points. The numbers in column 4 are based on a rise in the unemployment rate by 8 percentage points.

Source: The National Center for Education Statistics (NCES) provides the number of individuals aged 15–24 leaving school between October 2016 and October 2017 without a high school credential (https://nces.ed.gov/programs/dropout/ind_01.asp). NCES Table 219.10 estimates the number of High School Graduates for 2019–20 as 3,652,130 (https://nces.ed.gov/programs/digest/d19/tables/dt19_219.10.asp). EducationData.org estimates that there were 2.3 million students aged 18–24 attending a post-secondary institution for the first time this year (https://educationdata.org/high-school-graduates-who-go-to-college/). Thus, approximately 1.3 million (3.6 − 2.3 million) high school graduates will be entering the labour force instead of enrolling in a post-secondary institution. NCES Table 318.10 estimates 989,000 individuals graduated with an Associate's degree in 2019–20. Total enrolment in institutions granting four-year degrees was 12,145,349 (https://nscresearchcenter.org/currenttermenrollmentestimate-spring2019/). According to Collegeatlas.org, 56 per cent of students who start at a four-year college drop out by year 6 since starting their college degree. Thus, we approximate the number of college drop-outs entering the labour market this year as (12,145,349:(0.56):(1/6) = 1,133,566. Adding this to the number of graduates with Associate's degrees gives 2,122,566 labour market entrants with 'Some college'. The number of Bachelor's degrees conferred in 2019–20 is reported in NCES Table 318.10 (https://nces.ed.gov/programs/digest/d18/tables/dt18_318.10.asp?referrer=report).

Increasing evidence suggests that labour market entrants will also suffer increases in mortality once they reach middle age. While it is well known that, for young (and other) workers, recessions tend to reduce mortality as they occur, the long-term effect on mortality in middle age turns negative. Schwandt and von Wachter (2020) find that entering the labour market during the large 1982 recession in the United States reduced life expectancy by between six and nine months for an unlucky entrant. Cutler, Huang and Lleras-Muney (2016) find similar results based on multiple cohorts from a broad range of countries.

Because the recent rise in unemployment rates has been substantially larger than in the early 1980s, for simplicity we double the estimates of Schwandt and von Wachter (2020). If we take 20 million as the number of young individuals potentially affected by a recession induced by the COVID-19 crisis, this would imply a total of 20 million life years lost due to the long-term effects of the economic crisis.[40] Assuming an average remaining life span of 65 years, this would correspond to approximately 258,000 lives lost. Given not all young workers may be as affected as those graduating during the crisis, a more conservative estimate would consider approximately 6.8 million graduates at risk. This would imply 7–10 million life years lost (see Figure 3), corresponding to 103,000–155,000 remaining lives (at a remaining life span of 65 years).

These potential cumulated losses in potential life years would accrue over the course of many decades. In sum, they are substantial relative to the losses in potential life years estimated for the COVID-19 crisis. As discussed in the previous section, by mid-September 2020, we can approximate a loss of 1 million potential life years, far below projected losses for labour market entrants.

Besides mortality, there is ample research that job loss and adverse labour market entry affects a whole range of health outcomes, though the reliability of these estimates is not always as strong because of measurement issues. But an extensive literature in epidemiology, social work and economics has shown that job loss leads to reductions in a broad range of indicators for both physical and mental health. Similarly, an increasing number of papers show that entering the labour market in a recession affects both specific health outcomes, such as the likelihood of heart disease in middle age, as well as health behaviours, such as drinking.[41]

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[40] Schwandt and von Wachter (2020) estimate that a rise in the unemployment rate of about four points led to a loss of 5.9 months (using a linear extrapolation beyond the sample window of 30 years after entry). For simplicity, given the larger increase in unemployment rates we take double that number to be an estimate of the COVID-19 recession effect. Hence, 20 million times 1 year implies 20 million life years lost; at a remaining life span of 65 years for young workers, this would imply 258,000 lives lost.

[41] See von Wachter (2019) for an overview.

In addition, both job loss and adverse labour market entries have effects on broader measures of well-being and socio-economic status beyond mortality and income. Over their life course, those affected face a higher risk of divorce, reduced fertility and increase in criminal behaviour, among others. Moreover, the attitudes of young labour market entrants towards risk and the role of government, among others, appear to be shaped by initial labour market experiences.

IV. Reforming unemployment insurance and short-time compensation to address the COVID-19 crisis

The policy choices made today will have a significant effect on the mortality, earnings and socio-economic outcomes of millions of new labour market entrants and job losers, which may extend over the course of their lives. Ideally, policy efforts would immediately assist affected workers and businesses, help dampen the recession induced by the COVID-19 crisis, and prepare the economy for a quick restart once COVID-19 is contained.

Most countries have responded to the crisis by ramping up existing workforce programmes that usually assist job losers, in order to be prepared for the possibility of a large and prolonged downturn. As in other large downturns, the main policy responses in the United States have been to make its UI system more generous and to directly support businesses. In addition, it has made its UI system more inclusive by covering self-employed workers. Other countries have put more emphasis on expansions of STC (also known as work sharing) programmes.

STC programmes that help prevent job losses and maintain employer–employee relationships are particularly suited to a deal with the current crisis, in which parts of the economy are 'put on temporary hold' due to COVID-19. Yet, they have seen less take up in the United States. The following section first briefly reviews the policy experience during the COVID-19 crisis in the labour market in the United States and contrasts it to approaches in other countries. A series of proposals to improve UI and, in particular, STC programmes are then discussed. Past recessions and experiences in other countries have provided some potential insights into how the existing workforce system could be harnessed and scaled to provide a more effective safety net for unemployed workers.

1. Unemployment Insurance

The bedrock of support for the unemployed in recessions in most countries is the UI system, which pays workers who have lost their jobs through no fault of their own a fraction of their past earnings for a fixed period of time. In the United States, this differs by state. It typically pays at most 50 per cent of past

earnings and lasts up to 26 weeks, but it pays less in many states. In the United States, Congress passed four broad rescue bills in response to the COVID-19 crisis, which collectively enacted several temporary changes to the UI system. While some of these were modifications implemented in past recessions, some of them were substantial departures from past practice.

The legislation waived the customary week between the start of unemployment and the first benefit received, and waived requirements that workers be actively searching for jobs. Instead of an increase in benefit replacement rates, every UI recipient received a federally funded $600/week supplement of so-called Federal Pandemic Unemployment Compensation (FPUC) for weeks of unemployment ending between 4 April and 31 July 2020. A new programme, Pandemic Unemployment Assistance (PUA), provided weekly benefits to workers not qualifying for regular UI, chiefly the self-employed. As in past recessions, workers exhausting their regular benefits can receive federally paid extended benefits for a fixed number of weeks, and the relief bills provided funding for the administration of the UI programme, including funds for modernising IT systems.

The experience with this temporary expansion of the UI programme to support workers not able or willing to work due to the COVID-19 pandemic has been mixed. Several of the issues that have arisen are specific to the US UI programme, whose parameters and administration fall to each of the 50 states. The resulting inability to make rapid changes to the states' UI systems has seriously affected efforts to respond to the crisis. Perhaps the best example is the inability to induce states to change their UI benefit levels, and hence the passage of the $600/week FPUC benefit. The resulting concern about the fact that the benefit replacement rate of many workers was well above 100 per cent was an important aspect in letting FPUC expire without a federal replacement. Another issue has been that outdated IT systems made implementation of new programmes such as FPUC and PUA cumbersome in many states, leading to large backlogs in processing of claims, given the unprecedented flood of new claims for UI benefits.

In addition, familiar problems with the US UI system have influenced the system's response. For example, inadequate funding of the states' UI Trust Funds, and the risk of bearing the potential cost of borrowing from the federal government to pay for benefits, have influenced states' decisions on whether to increase UI benefits unilaterally. Incomplete or inexistent data sharing between government agencies has left the system vulnerable to fraud, in particular for the new PUA programme. Similarly, the use of internal data sources to monitor the development of the crisis and the roll out of benefits was often rudimentary during this crisis. Last but not least, the fact that a large number of individuals in the United States still receive health insurance benefits through their employers has meant that a large number of unemployed lost health insurance coverage during the crisis.

Based on these and past experiences with the US UI system, and experiences of other countries, there are several suggestions for reforms that go beyond what is currently in the federal legislation. The first set of these **basic reform proposals** would be extremely helpful to implement for any recession going forward, and particularly useful in a pandemic.

- *Automatic temporary increases in part-time UI benefits*. A defining feature of recent recessions has been the rise of involuntary part-time employment. To encourage continuing attachment to their employers, and to the labour market more generally, partial UI benefits paid to workers partly working while on UI should be increased during recessions.[42]
- *Federally funded extensions in UI durations activated by automatic triggers based on states' unemployment rates*. The ad hoc nature of federally funded extended benefits has proven to be an important hurdle to providing reliable insurance to workers in past recessions.
- *Significantly expand the use of data from the UI system*. Currently, only aggregate statistics are produced by all states on a routine basis. There is scope to substantially increase the use of existing data to better monitor the development of economic conditions at a weekly level.[43]
- *Integrate UI and workforce training programmes*. Better integration of the UI and elements of the workforce training system serving displaced workers would allow UI recipients to engage in training or education while looking for a job.
- *Provide a floor for UI benefit amounts and durations*. Institute both federally required minimum UI benefits and UI durations and required UI Trust Fund adequacy as a precondition to receiving federal funding in recessions.

In addition, **disaster-specific reforms** have the promise to substantially ease the rapid scaling of the UI programme during large recessions and national crises.

- *Institutionalise extensions of UI to uncovered workers activated by automatic triggers based on states' unemployment rates*. As with existing Disaster Unemployment Assistance, PUA should be made a permanent programme that is triggered in large economic crises. Ideally, this programme would be triggered as soon as the unemployment rate, or some other measure of labour market slack, reaches a certain threshold

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[42]Typically, UI benefits are reduced for every dollar earned beyond a certain earnings threshold. Hence, benefits can be raised by increasing the earnings disregard or the rate at which benefits are reduced for additional earnings. For an example of a proposed reform of partial UI and its implications for benefits in California, see Hedin, Schnorr and von Wachter (2020).

[43]For example, Bell et al. (2020) use micro data from the UI system in California to provide detailed analysis of incidence and dynamics of UI during the crisis by demographic groups, industry, and regions.

- *Institutionalise automatic benefit increases activated by automatic triggers based on states' unemployment rates*. To prevent need for ad hoc and ill-designed benefit increases in case of need, increases in replacement rates should be automatically triggered based on levels of the unemployment rate.
- *Institutionalise fast tracking of initial approval and ongoing certification*. Certain states have experimented with automatic certification (e.g. California), and the case has been made to automatically approve benefits in times of crisis.[44,45]

Even before the crisis, many observers had flagged the need to reform the UI system in the United States, including inadequate financing and resulting benefit cuts, ad hoc extensions in downturns, and lack of take up.[46] The pandemic has brought some of these issues into further focus, and expanded the list of needed reforms. Yet, probably a better way to assist workers in pandemics and large recessions is to extend STC programmes, also called work sharing programmes.

2. Short-time compensation (work sharing)

STC programmes have become an integral part of how many countries respond to recessions. In the United States, STC is an optional part of the UI system. Almost 30 states have currently functioning STC programmes. Generally, STC programmes, in the United States and elsewhere, allow firms to reduce payroll costs through across-the-board reductions in hours rather than targeted layoffs. Workers' shortfall in earnings is made partly up by payments from the UI system. Workers receive the same benefits as they would under UI, but proportional to the amount of lost earnings. In regular times, to qualify, firms have to reduce time worked by a minimum amount and cannot reduce it beyond a maximum amount (e.g. currently 10 per cent and 60 per cent in the United States). In the United States, as for regular UI, the system is funded through payroll taxes. Hence, firms using STC experience increases in payroll taxes.

There are some clear benefits of STC with regards to regular UI. STC is particularly well suited for an economy affected by a pandemic-induced recession that, in principle, could 'turn back on' once infection subsides. But

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[44]Dube and Rothstein, 2020.

[45]Despite concerns of fraud, during much of the crisis in California, incidences have been rare. For example, the Employment Development Department (2020) states 'of 183,167 cases in the three months of May, June, and July this year, less than one half of one percent (0.04% or 804 people) were deemed imposters during EDD review of the Identity Verification Database'. Moreover, even in the absence of expedited verification, fraud can occur (e.g. Bell et al., 2020).

[46]See, for example, von Wachter (2019), Chodorow-Reich and Coglianese (2019) and O'Leary and Wandner (2020).

STC can be generally helpful in downturns as well. STC can help to prevent costly layoffs, preserve productive job matches, and avoid time-consuming processes of job search by workers and vacancy filling by firms, as well as costs of training and on-the-job learning once the economy goes back to normal. As is the case for UI, STC targets benefits to those businesses and workers most in need, and hence is able to adjust to the changing economic environment as a crisis or recession evolves. As a result, STC acts as an automatic stabiliser because it buffers shortfalls in earnings while supporting firms that need to cut costs. Last but not least, in contrast to workers receiving partial UI, workers on STC maintain their health insurance and their pension benefits. Retaining partial employment also ensures low-income workers can file for the Earned Income Tax Credit (EITC) and gain or retain eligibility for disability insurance.[47]

Despite these benefits, participation in STC can be more costly to firms than layoff, especially in severe recessions. Under STC, firms continue to bear the costs of pension and health insurance benefits, face more complex application procedures, and may bear a greater burden of arranging work schedules. There is a case for subsidizing the participation in STC in recessions. The latest research shows that long-term costs of job loss during recessions stem from an increase in unemployment duration and a reduction in job availability among high-wage employers.[48] Hence, from society's point of view adjustment occurring in a period when more and better jobs are available is likely to be preferable. Consistent with this argument, countries have expanded and often subsidized STC in recessions.

In the United States, the expansion and federal financing of STC was proposed and ultimately approved in the aftermath of the Great Recession, but adoption among employers in states with STC programmes was found to be low, partly because of a lack of information, and partly because it raised firms' payroll taxes.[49] Take up of STC in the United States during the COVID-19 crisis has been very uneven across states, despite the fact that the programme was significantly expanded. During the COVID-19 crisis, all STC benefits are paid entirely by the federal government until December 2020 (50 per cent for states establishing a new programme).[50] STC participants could receive the

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[47]Especially, longer-term unemployment can lower eligibility for the EITC. For workers just above the earnings threshold for EITC eligibility, temporary unemployment can raise eligibility (e.g. Bitler, Hoynes and Kuka, 2014).

[48]See Lachowska, Mas and Woodbury (2020) and Schmieder, von Wachter and Heining (2020) for an analysis of the loss of employer-wage premiums at job loss; Schmieder, von Wachter and Bender (2016) provide causal estimates of the effect of unemployment duration on wages.

[49]Abraham and Houseman, 2010.

[50]States were able to apply for federal funds to modernise existing programmes and to establish new programmes. For example, in the Families First Coronavirus Response Act, the law provides that the Secretary of Labor will give states technical assistance and guidance in establishing, implementing and improving employer awareness of STC programmes to help avert layoffs

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full $600 weekly FPUC benefits, making the programme more attractive than UI. In addition, the US Department of Labor clarified that STC could be used to rehire laid-off previously full-time workers on a part-time basis.

The fact that STC was fully federally funded in the United States should have made this programme an attractive alternative to states and businesses alike. For states, raising STC participation would have saved money for states' UI Trust Funds, avoiding potentially costly borrowing from the federal government, and businesses could have avoided increases in payroll tax rates through experience rating.

Several factors likely contributed to the low take-up rate of STC benefits in many US states. In many states, lack of automation of the STC programme delayed approval and made scaling of participation in STC difficult. Many states do not have appropriate outreach mechanisms in place, and prior research suggests awareness has been a key hurdle for taking up the programme. States that did have higher participation, such as Michigan, engaged in proactive outreach to businesses in order to promote STC. Initially, there was some confusion about whether STC claimants would have been eligible for the $600 FPUC benefit, possibly contributing to an initial wave of layoffs in the second half of March. Furthermore, availability of short-term business loans through the Payment Protection Programme (PPP) that would be forgiven if businesses maintained their pre-pandemic payroll may have crowded out participation in STC.[51] Finally, some of the parameters of the programme remained restrictive, such as the requirement that reductions in hours have to be between 10 and 60 per cent.

The experiences in the Great Recession, during the COVID-19 crisis, and in other countries suggest some potential lessons for how to strengthen the STC programme. The following presents a list of **reform proposals of STC/Work Sharing programmes**.

- Institute fully federally funded, trigger-based STC benefits during recessions that do not increase the payroll taxes of participating firms. Functioning STC programmes in Europe are typically subsidised and financed separately from UI benefits. This would help increase take up of STC, support states' UI trust funds, and avoid increases in payroll taxes of already struggling firms.
- Make participation in STC a requirement to obtain business emergency loans. Incorporating STC with other relief efforts for firms, such as emergency credit lines, would help to raise awareness and take up of STC. In addition, as state labour offices routinely monitor compliance with STC

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[51]The loan would only be forgiven in full if firms maintained their pre-crisis payroll. As a result, PPP might have been more attractive to workers as it was meant to replace their entire earnings in case of furlough.

plans, it would also ensure that firms indeed maintain their payroll and that wage payments actually reach workers. This mechanism is largely absent in business lending programmes.

- Allow firms and their payroll processors to pay benefits to workers in times of recessions, and reimburse firms through payroll tax credits. This would help to substantially decrease the burden for businesses of enrolling in the programme, while maintaining the states' ability to sign off on firms' STC plans.
- Eligibility should be automatically broadened and, if needed, expedited in downturns. For example, even firms with smaller or very large reductions in hours can participate, and firms should be able to rehire workers on a part-time basis. A protocol for expedited approval of claims in pandemics should be implemented.[52] Based on proposals in von Wachter (2020), California's assembly has voted to introduce an expedited STC approval process.[53]
- Provide incentives to modernise or institute STC programmes. States that do not currently have an STC programme should receive incentives to adopt a programme with assistance from the US Department of Labor. States with an existing programme should receive incentives to fully automate the processing of STC applications.

Instituting automatic financing and extensions of STC during downturns, integrating it with business emergency loans, and involving firms and payroll processors in the disbursement of benefits would create a robust programme able to play an integral role in assisting employers and workers over the business cycle.

Existing evidence from European countries suggests STC is an effective tool for stabilising employment.[54] Given the research on the significant negative outcomes faced by job losers during a recession, an expansion of these programmes provides a clear opportunity to improve outcomes for affected workers, and can help effectively put the economy 'on hold' while the virus is contained.

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[52]Strategic abuse of STC has been found to be low in the United States and in other countries, and is likely to be less of a concern in times of a large economic downturn, such as the one triggered by COVID-19.See, for example, Wandner and Balducchi (2010). Abraham and Houseman (2014) mention that states put regulations in place to prevent abuse, but that these tend to discourage participation. See also https://www. nelp.org/wp-content/uploads/2015/03/Lessons-Learned-Maximizing-Potential-Work-Sharing-in-US.pdf.

[53]See Assembly Bill AB 1731, https://asmdc.org/press-releases/boerner-horvaths-economic-recovery-bill-save-jobs-and-expand-unemployment-benefits.

[54]Two studies using quasi-experimental research designs find beneficial employment effects for France and Italy in the Great Recession. For example, Giupponi and Landais (2018) show that STC programmes implemented in Italy during the Great Recession helped to stabilise employment and they calculate positive welfare effects. Cahuc, Kramarz and Nevoux (2018) obtain similar findings for France. Estimates from other studies are mixed (reviewed in Giupponi and Landais, 2018), but generally support positive employment effects.

An alternative approach would be to institute a **national emergency STC/work sharing programme** that would automatically trigger during recession. von Wachter and Wandner (2020) outline how such a national emergency STC system would work in the context of the United States. Countries with existing national programmes should consider integrating automatic expansions during recessions.

Extending STC programmes would bring the United States closer to other countries, where STC programmes have been an integral tool to support businesses and firms affected by the COVID-19 pandemic. Several countries have sizeable national STC programmes that are used in regular downturns and that were expanded during the pandemic, including France, Germany and Italy. Many more countries expanded existing STC programmes, including Australia, Austria, Canada and Norway. Some introduced temporary programmes, such as the UK Coronavirus Jobs Retention Scheme, which paid partly or fully furloughed workers a fraction of their prior earnings.

Most of these countries' STC programmes exhibit basic similarities to the US programmes, with some important differences. For example, in France, Germany and Italy, companies can reduce hours up to 100 per cent, instead of 60 per cent in the US case, making the programme more broadly applicable. Most European countries also have higher baseline replacement rates. The replacement rate was 70–90 per cent in Austria, France, Italy, the Netherlands and Norway. During the crisis, Germany increased its replacement rate from 60 per cent to 70 per cent (80 per cent) after three (six) consecutive months on STC.

Perhaps most importantly, the changes to these countries' STC programmes were relatively straightforward to implement, because they did not require the modification of existing programmes or the institution of new STC programmes in 50 US states. Perhaps not surprisingly, the participation in these more established national programmes during the COVID-19 pandemic was substantially larger than in the United States. While comparable administrative programme data have not been made widely available, estimated numbers are impressive.

For example, in Germany, a leading think tank estimated that 5.7 million workers, or 20 per cent of covered employment, were receiving STC benefits in June.[55] In contrast, the number of workers participating in STC never rose beyond 500,000 workers, less than 0.5 per cent of covered employment.[56] Partly as a result of these differences, the United States had substantially larger increases in unemployment than Germany.[57] Participation in STC was also

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[55] https://www.ifo.de/node/57307.

[56] Covered employment in the United States in September was 146 million (https://www.dol.gov/ui/data.pdf).

[57] Gimbel, Rothstein and Yagan, 2020.

substantial in other countries. In Italy, the social security agency reported that in early July 7.6 million workers were eligible for STC benefits.[58] In France, over 9 million workers were on STC in April.[59] In the United Kingdom, almost 10 million workers have been reported to be on the temporary furlough scheme.[60] Overall, these experiences demonstrate that widespread participation in STC is feasible in times of large recessions, and can prevent potentially large increases in unemployment that put workers at risk of long-term adverse outcomes.

V. Conclusion

In many countries, public health measures aimed at containing the COVID-19 pandemic have triggered large and prolonged economic downturns. In the case of the United States, this has entailed staggering increases in unemployment. This paper has reviewed the potential longer-term consequences on earnings, employment and health for those workers losing their jobs or for young workers starting work during the crisis. The paper has also discussed whether the large number of potentially affected workers could imply lasting changes to employment rates going forward.

Taking the range of potential estimates of the amount of costly job loss, the approximate reduction in the EPOP ratio is around 0.6 percentage points (1 per cent relative to its February level) for a total of 16 million costly job losses, and up to about 1.8 percentage points (2.5 per cent) if we assume that the cumulated 38 million new UI claimants since the start of the crisis experience lasting employment reductions. In contrast, during the Great Recession, the reduction in the EPOP ratio was estimated to be 1.5 percentage points.[61]

In contrast, many other OECD countries have opted to stabilise their workforces using STC (work sharing) programmes. After a brief review of the US experience with labour market policy during the COVID-19 recession, the the paper puts forward a range of proposals about how to reform the US UI and STC systems in order to better insulate workers and the economy from the deleterious effects of large recessions.

Short of establishing a national emergency STC programme, as suggested by von Wachter and Wandner (2020), the United States can substantially improve its UI and STC programmes by instituting a series of automatic, federally funded extensions that are activated by automatic triggers based on the state of the national or the local labour market. To ensure payrolls

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[58] https://www.inps.it/nuovoportaleinps/default.aspx?itemdir=54013 and https://www.inps.it/docallegatiNP/Mig/AllegatiNews/Notizia_form_accessibile_integrazioni_salariali.pdf.

[59] https://www.france24.com/en/20200417-pandemic-leaves-one-in-three-french-workers-on-temporary-unemployment.

[60] https://www.bbc.com/news/explainers-52135342.

[61] Song and von Wachter, 2014.

are stabilised and workers receive benefits, business emergency loans should be tied to participation in STC programmes. To further institutionalise use of STC, large payroll processing companies should be allowed to assist companies in filing for and possibly disbursing STC benefits.

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